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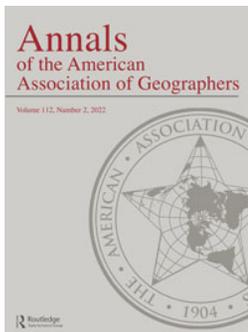
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Climate Gentrification: Risk, Rent, and Restructuring in Greater Miami

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Despite the growing power of finance over cities and housing, the relationships between finance, climate risk management, and urban governance have yet to be examined from a climate gentrification perspective. Putting the practices of a wide array of property finance stakeholders in conversation with the foundational concept of the rent gap, we identify two real estate rent dynamics that are emerging against the prospect of climate-driven urban restructuring: *risk rents*, or new forms of value capture crafted against future risk, and *rent at risk*, or the anticipated loss of rent due to risk. We in turn illustrate how climate risk–rent dynamics constitute new or intensified processes of gentrification in Greater Miami, Florida. Through three vignettes, we show how configurations of real estate and finance climate risk management produce variegated yet interrelated opportunities for devaluation and revaluation, displacement, and downgrading. Such strategies push the gentrification frontier into new physical as well as institutional spaces. The Greater Miami story underscores the need for new forms of knowledge, coalition building, and integrated urban climate risk management practices that directly confront underlying financial drivers of housing and spatial injustice in risky real estate markets. *Key Words:* climate risk management, financial institutions, Florida, gentrification, Miami, real estate.

Climate gentrification has become a powerful organizing concept within contemporary analyses, and responses to how climate change governance strategies could create new or worsened inequities within cities and housing geographies. In Barcelona, for example, investments in open space and other sustainability features extend much-needed amenities to low-income communities, yet have also triggered waves of displacement among the city's poorest residents (Anguelovski et al. 2018). Although greening and resilience measures have been rolled out in Philadelphia to great fanfare, they might be reproducing the very forms of racialized vulnerability they seek to address (Shokry, Connolly, and Anguelovski 2020). State-led “green” regeneration tactics in Gdańsk have served as a force of displacement but also a focal point of contestation (Bouzarovski, Frankowski, and Tirado Herrero 2018). As Miami's wealthy coastal areas face rising sea levels, property speculators have steered development to higher elevation, low-income communities of color, exacerbating long-standing local equity and

housing affordability concerns (Keenan, Hill, and Gumber 2018).

The concept of climate gentrification builds on a fruitful dialogue between several traditions of scholarship concerned with urban and environmental equity (Anguelovski et al. 2019; see also Dooling 2009; Safransky 2014; Rice et al. 2020). Environmental justice and disaster management studies have demonstrated how an array of social, economic, and ecological contingencies—including but not limited to race, ethnicity, class, gender, and coloniality—shape the exposure of populations and places to hazards, by way of housing, infrastructural, planning, finance, and other institutional systems and structures (Peacock, Marrow, and Gladwin 1997; Hartman and Squires 2006; Jacobs 2019; Rivera 2020). In urban studies, a rich legacy of research has analyzed the evolving causes and effects of gentrification, displacement, disinvestment, and related processes of uneven development within cities. Scholars have more recently attended to the ways in which financialization, touristification, and studentification enhance conditions for gentrification and how such

processes are often closely linked with public policies (D. Smith 2005; Mendes 2017; Wachsmuth and Weisler 2018; Aalbers 2019).

Despite the growing power of finance over cities and housing, the relationships between finance, climate risk, and urban governance have yet to be examined from a climate gentrification perspective. This is a crucial absence. From mortgage lending to property insurance and from institutional real estate investment to public debt programs, financial institutions shape the political economic fortunes and material forms of cities in powerful ways (Aalbers 2020). At the same time, real estate- and infrastructure-linked asset classes and municipal debt are increasingly valuable sources of collateral for capital market investors, the scope of which represents tens of trillions of dollars of outstanding investment. Recent scholarship and practice-oriented discourse from within the real estate and finance sector consider how climate risks stand to undermine these coconstitutive relationships, both through the direct impacts of growing disaster losses and through institutional efforts that seek to preempt future losses through risk management interventions or to otherwise unlock “resilience dividends” (see, e.g., Pyke 2018; Burgess and Rapoport 2019; Schimetschek et al. 2019; Keenan and Bradt 2020; Taylor 2020). These anticipatory climate risk management dynamics are likely to meaningfully transform cities and housing geographies—and their ownership and affordability—long before rising seas permanently breach property lines.

In this article, we demonstrate how emerging and variegated real estate and finance climate risk management practices feed existing or create new climate gentrification pressures. We relate research insights from two perspectives: by mapping climate risk management practices from within real estate and finance institutions on one hand and by exploring how these practices are articulated through the distinctive urban geographies of Greater Miami on the other. By addressing the curious absence of finance in climate gentrification studies, we seek to bring attention to the ways in which “financialized” climate risk management practices can contribute to urban displacement and disinvestment dynamics. In so doing, we wish to promote greater discussion of the attendant contradictions, challenges, and opportunities that face urban stakeholders and financial market institutions concerned with making existing orders of financialized urbanism more resilient to climate change.

Our argument, and the structure of this article, is as follows. First, we revisit and expand on a foundational concept within gentrification studies—that of the rent gap—to help situate real estate and finance climate risk management practices in relation to gentrification. Two risk and rent dynamics—*risk rent* and *rent at risk*—are proposed as heuristic devices, as tools that can be used to analyze how particular real estate and finance climate risk management practices contribute to gentrification pressures at specific urban junctures. Of course, climate gentrification is not an isolated phenomenon shaped only by climate risk and its management or other forms of ecological intervention and greening. Instead, climate gentrification should be understood as a process that extends or intensifies general gentrification dynamics, which have long been transforming patterns of disinvestment, displacement, activism, and other forms of intervention in particular contexts.

Second, we examine how real estate and finance climate risk management shapes climate gentrification in differentiated ways in Greater Miami. In recent years, Miami has become a metonymic “risky” city, owing to the region’s exceptional exposure to rising seas, tropical cyclones, and other climate risks on one hand and real estate-dominated political economy on the other (Wakefield 2019; Grove, Cox, and Barnett 2020). Fragmented local and regional government climate adaptation planning efforts, the highly financialized and internationalized real estate market’s exposure to extralocal climate risk perceptions and risk management practices, and persistent housing affordability and residential inequality are among the many intersecting dynamics that have made Greater Miami a key site of climate gentrification activism, storytelling, scholarship, and debate (e.g., Keenan, Hill, and Gumber 2018; Green 2019; Miami Climate Alliance 2020).

The experiences of Greater Miami’s low-income communities of color have, rightfully, been a major focal point of the climate gentrification debate to date. Yet this initial cartography of climate gentrification is arguably unfinished. Following Angelovski et al.’s (2019, 1074) call to “disentangle” the role of finance and financialization in greening and climate gentrification, and to attend to the spatial nuances of climate gentrification within urban contexts, we seek to extend this current cartography by mapping out how specific relations of real estate and finance climate risk management and countermanagement (e.g., by activists and local governments) interact

with existing urban geographies to produce varied yet interconnected climate gentrification pressures and pathways.

We do so through three vignettes of climate gentrification in Greater Miami. From the vantage of the gentrifying uplands, we see how property speculators hedge against rent at risk along the flood-prone coast as they purchase property in higher elevation neighborhoods. Yet as speculators seek to capture risk rent from premium elevations, they also deepen housing displacement pressures in low-income communities of color, sparking counterproposals for housing and climate justice from activist alliances. Within the citadel by the sea, capital continues to flood luxury property markets, despite growing awareness of climate risk. Developers and the local state leverage sustained high-value coastal development to fund a “densify to adapt” strategy that seeks to secure existing rent at risk through costly infrastructural intervention. Finally, across still-simmering suburbia, we see how fast-rising homeowners’ insurance premiums exacerbate enduring cost burdens for mortgage-holding households. Insurance risk rent mobilized to defend mortgage rent at risk may ultimately erode prospects for middle-income homeownership in “risky” areas or, worse yet, contribute to neighborhood and municipal decline.

The purpose of this exploration is neither to capture nor quantify every possible permutation of climate gentrification currently or potentially underway in Greater Miami. In some cases, these dynamics are clearly apparent in the practices and discourses of stakeholders, whereas in others they are contingent on uncertain and emergent strategies, plans, and programs. Given this complex and fast-changing governance landscape, we instead seek to draw greater, forward-looking attention to the ways in which efforts to mobilize and manage climate risks within real estate–finance relations play out unevenly, and often in contradictory ways, across housing and urban geographies and how these dynamics point to more or less equitable and resilient futures that might be reappraised and reimagined.

Method

This article is based on findings from a multiyear study on the real estate–climate risk management practices of financial institutions (e.g., asset managers, investors, property reinsurers) and their articulation in urban contexts with high-value property

markets with significant climate risk exposures. The larger project is concerned with understanding how real estate and finance climate risk management practices are coconstituted through the interplays between financial institutions (e.g., between insurers and lenders, institutional investors, asset managers) and in relation to specific urban property market contexts (i.e., Greater Miami, the Randstad region of the Netherlands, and Singapore). This article adopts a geographical political economy approach (Sheppard 2011; Fernandez and Aalbers 2016), through which we aim to situate and weave together the perspectives and practices of multiple actors.

We draw our findings from several methods and sources. First, semistructured interviews were conducted with institutional real estate and finance directors, risk management professionals, and financial market regulators, along with Miami-area real estate development, planning, and activist stakeholders. Second, an exploratory workshop on real estate climate risk was hosted in Miami in partnership with a local real estate professional association, which convened ten expert participants, including prominent figures within the Greater Miami “growth machine” (e.g., developers, insurers, architects, lawyers). Third, targeted real estate, housing, and local government market research was conducted in Miami, including a survey of new high-rise development projects and financing sources (using regional industry publications and public records), an analysis of residential insurance rates using actuarial data from the Florida Hurricane Catastrophe Fund, and demographic analysis using American Community Survey data. Fourth, participant observation was conducted at several real estate and finance industry and local community organization events related to climate issues, including but not limited to insurance and investor conferences in Greater Miami, Singapore, and London, and scholar- and activist-organized urban climate resilience and housing justice events in Greater Miami. Fifth, real estate and finance industry reports on climate risk management were examined to identify emerging industry themes and practices.

Climate Risk and the Rent Gap

Building on Neil Smith’s (1979) foundational work, scholars have long used rent gap theory to conceptualize the political and economic conditions and practices that underpin gentrification. Most fundamentally, the rent gap refers to the difference

between the current value of land and the future value if that land is brought to its so-called highest and best use through improvements (e.g., by upgrading the asset on it). Debates on the rent gap are almost as old as debates on gentrification itself. We do not intend to rehearse more than four decades of rent gap debate but would like to emphasize that, for Smith, the idea of the rent gap was not meant to produce a universal theory according to which gentrification unfolds in the same way across time and space. Instead, Smith argued that one fundamental underlying dynamic of gentrification—although by no means the only one—relates to how capital views risks and opportunities in the built environment and steers both investment and disinvestment accordingly.

More than a model to be tested empirically, the rent gap was and remains primarily a heuristic device to understand the characteristics that different forms of gentrification share across time and space; that is, a drive by real estate and financial capital to extract value through the built environment. The rent gap is intended to be an explanatory rather than a predictive tool to understand the geography of gentrification “in particular places at particular times” (N. Smith 1996, 1202). This reading of the rent gap implies that the concept needs to be constantly reinvented and reinterpreted to make sense of the new forms, new spaces, and new times of gentrification. It is in this spirit that Wachsmuth and Weisler (2018) mobilized the concept of the rent gap to make sense of the connection between Airbnb and gentrification, arguing that

[A]irbnb introduced a new potential flow into housing which is systematic but geographically uneven, creating a new form of rent gap in culturally desirable and internationally recognizable neighborhoods. This rent gap can emerge quickly—in advance of any declining property income—and requires minimal new capital to be exploited by a range of different housing actors, from developers to landlord, tenants and homeowners. (1147)

Because Airbnb can cause potential rental income to rise sharply, it creates a new or widened rent gap, potentially in the absence of previously declining property income or value.

Gentrification is always linked to the search for new frontiers of urban redevelopment and restructuring, in which rent gaps can be exploited. This frontier has a spatial expression (e.g., a low-income

neighborhood bordering a higher income area or a development along a new infrastructure axis), as well as another dimension in which the frontier is more metaphorical, in which new technologies or sociocultural developments are turned into opportunities for urban accumulation. Analytically, the spatial and metaphorical dimensions of the frontier can be separate, but empirically speaking they are typically intertwined. In previous decades this has resulted in the coinage of “new” gentrifications, such as studentification, supergentrification, and rural gentrification. Lees, Slater, and Wyly (2008) spoke of these as “mutations” of gentrification. The recent literature on gentrification has focused on two prominent new frontiers or mutations of gentrification and rent seeking: on the one hand, the combined workings of touristification and platform capitalism and, on the other, climate, green, and ecogentrification.

Climate risk management practices by real estate and finance institutions—and countermanagement strategies by other institutions, states, and stakeholders—open up frontiers for new, deepened, or restructured forms of rent-seeking. Such strategies are played out in an existing context of uneven development and will always be entangled with ongoing patterns of urban restructuring, including gentrification. Yet climate risks and their management can directly augment the structure of the rent gap itself, while also reshaping the broader social relations of rent, in ways that transform the potential rent to be extracted from assets, neighborhoods, or regions perceived to be at risk to climate change.

Two types—risk rent and rent at risk—add clarifying nuance to our formulation of these emergent dynamics. *Risk rent* refers to the creation and capture of new increments of economic value in relation to climate risk. The most direct example appears in property insurance underwriting, which marketizes real estate climate risk through annual policyholder premium payments (Taylor 2020). By regularly revising scientific assumptions about the frequency and intensity of hazards, the impacts of hazards on particular construction techniques, and underwriting and risk strategies, catastrophe risk models and other contemporary actuarial practices enable insurers and reinsurers to assign an economic value to real estate climate risk and to levy that through a rent relation: the annual insurance policyholder premium payment (Taylor and Weinkle 2020; Gray 2021). Similarly, real estate developers and institutional investors

increasingly seek a resilience dividend on assets, master-planned developments, portfolios, and funds that incorporate climate risk management features, which can range from the material (e.g., green roofs to offset heat effects) to the managerial (e.g., climate risk due diligence within underwriting; Schimetschek et al. 2019; Urban Land Institute 2021).

Rent at risk refers to existing or anticipated increments of rent that might be lost due to climate risks or their management and includes aforementioned industry concerns about the prospects of higher costs of capital and operating expenditures, direct losses incurred by property damages, and declining future markets for assets in risky property markets (Burgess and Rapoport 2019). The growing institutional adoption of insurer catastrophe risk models, third-party vendor physical climate risk mapping and scoring, and other techniques of spatial analysis to assess real estate investor climate risk exposures offers one clear example of how investors are beginning to appraise rents at risk and, in turn, reevaluate their investment strategies (see, e.g., Kanne, Malek-Madani, and Bendix 2017; Four Twenty Seven 2018; Schimetschek et al. 2019; Urban Land Institute 2020). These insights are guiding a wide array of bespoke strategies among early adopter investment institutions, examples of which include the incorporation of climate risk within the new asset acquisition process, direct investment in asset-level risk mitigation (e.g., asset hardening), strategies for assessing and engaging with infrastructure and resilience planning in high-exposure markets, discounting the anticipated exit yields for “risky” longer term holds, and wholesale retreat from markets considered to be too risk exposed.

Climate risk scrutiny is also emerging across the U.S. mortgage finance system value chain, from local lending to secondary market investment. Keenan and Bradt (2020) found that mortgage lenders might leverage their local knowledge of flood risk by selling mortgages on properties in flood zones to government-sponsored housing finance enterprises (GSEs, which sell mortgage-backed securities to investors) at higher rates, offloading rent at risk within their loan portfolios. Concerns about mortgage rent at risk are also reflected within the practices of GSEs and their investors. Following the global financial crisis, in 2008 and 2009, regulators required GSEs to actively manage the prospect of widespread borrower defaults through the purchase of new forms of

insurance, called credit risk transfer (CRT). GSEs and their investors are increasingly concerned with how physical climate risks affect mortgage loan performance, and in turn CRT markets (Kousky, Palim, and Pan 2020). Capital market institutions that invest in CRT have taken further steps to manage the catastrophe risk-related component of their default exposure by purchasing new insurance products collateralized by other investors (Evans 2021), and there have been calls for regulators to expand the use of CRT to manage climate risk within the mortgage system (e.g., Rossi 2021). The latter example shows how the institutional and transactional spaces of mortgage markets are increasingly reworked in relation to climate risk, both to secure existing mortgage rent at risk and to unlock new risk rents through innovations in insurance markets (Taylor 2020).

Speculative understandings of climate risk bring uncertain futures into near-term financial and property market reality, as witnessed by fast-changing home buyer perceptions of coastal flood risk and, by extension, property values (McAlpine and Porter 2018) or in how long-term property climate risks are valued and incorporated within institutional investor risk management appraisal practices (Urban Land Institute 2020, 2021). These examples suggest that speculations on climate risk might not only serve to shore up existing risk rent practices or identify new risk rent opportunities within institutions but will also transform the interplays between institutions and places in conflictual ways. Property insurance and reinsurance offers a salient example of this dynamic, given its near-monopolistic risk management function within high-value real estate and finance systems, through which underwriters can capture additional risk increments in the near term (Johnson 2015; Taylor 2020). Over time, however, the increasing diversion of property income to fund the risk rent demanded by insurers might winnow the potential rent available for capture by the asset’s owner or other stakeholders, sparking distributional conflicts among and beyond property interests, as seen in insurer-led efforts to increase hurricane risk-related premiums in the Florida residential insurance context over the last thirty years (Taylor and Weinkle 2020).

Even for the most aggressive proponents of climate risk-adjusted underwriting and investment, there are several limits to climate action within real

estate and finance institutions. Institutional interventions are constrained by the uncertain temporalities presented by climate change scenarios, the insufficient spatial granularity of risk mapping and modeling tools, and the inconsistent assumptions programmed into such tools (Keenan 2019; Fielder et al. 2021). Existing model approaches also fail to account for the multitude of urban interdependencies that shape asset- or market-level risk exposures, be it the viability of asset-adjacent public infrastructure or broader patterns of climate-induced migration (Urban Land Institute 2021).

Complex chains of ownership, asset management, and regulation further complicate investor-driven efforts to influence asset-level risk exposures. A single institutional investor might hold indirect ownership stakes in hundreds of assets across the world through specialist funds, the managers of which must be equipped and encouraged to conduct asset- and market-level climate risk assessments across dozens of property (sub-) markets. Institutions must in turn analyze, interpret, and deliberate over these results before adapting investment strategies (see, e.g., Schimetschek et al. 2019). An uneven and fast-shifting patchwork of regulations—from climate risk disclosure concerns (Condon 2021) to sector-specific solvency and consumer affordability considerations—further complicates the rollout of a single, coherent real estate climate risk management regime. As such, beyond “early mover” examples widely cited in industry reports and debates, the extent to which climate risk management has been systematically taken up by, and meaningfully transformed the strategies of, real estate and finance institutions appears limited.

Emergent real estate and finance climate risk management practices nevertheless have significant potential to profoundly transform cities, with both direct and indirect implications for housing and gentrification. Truncated investment horizons, asset discounting, or wholesale redlining for “no go” regions could trigger or exacerbate declines in property values in risky areas (McAlpine and Porter 2018), leaving assets (and mortgages) financially “underwater” and eroding property tax bases (Chung 2020; Shi 2020). At the same time, rising consumer insurance and reinsurance premiums (Taylor 2020; Elliott 2021) and other mortgage- and loan-related risk management costs (e.g., mortgage credit risk transfer expenses) could increase housing costs in the same geographies. The convergence of these second- and

third-order dynamics could ultimately promote a shift from ownership to rental tenures and institutional landlordism (Kahn 2021) or lead to new waves of housing unaffordability-driven abandonment and foreclosure. Negative neighborhood effects, and existing and unequal municipal fiscal capacities to offset them, will likely extend these dynamics along long-standing fault lines of urban and regional inequality produced through processes of segregation, redlining, redevelopment, and austerity.

Whether these institutional dynamics create opportunities for gentrification or property investment and reinvestment will be contingent on how institutional real estate business models and financing arrangements evolve in the near future, whether or not returns from assets and neighborhoods can be profitably secured through asset retrofits or larger scale public infrastructure investment, and the extent to which vulnerable communities and regions can absorb climate risk-related transformations in equitable and inclusive ways. State and civil society practices and interventions will invariably shape how climate risks are regulated, subsidized, mitigated, or otherwise (re)distributed between current and future asset owners and society at large. As ever, historical geographies of urbanization and environmental management, state and civil society institutional capacity, legacies of housing and environmental injustice, and other factors will inform the ways in which individuals, neighborhoods, cities, and regions shape, and are shaped by, these financial dynamics. As such, our understanding of emerging real estate climate risk and rent dynamics must be situated in relation to the particulars of place and real estate–finance capital’s entanglements therein. To do so, we turn to a formative site of climate gentrification: Greater Miami.

Climate Gentrification in Greater Miami: Three Vignettes

Dubbed “the Magic City” by early real estate boosters, Greater Miami is emblematic of the ways in which emergent risk and rent dynamics shape multiple frontiers for climate gentrification. Miami’s political economy is reliant on the reproduction of a highly internationalized real estate market (Sassen and Portes 1993; Nijman 2011; Grove, Cox, and Barnett 2020), which is marked by significant housing inequality and affordability challenges (Florida

and Pedigo 2019; Wijburg 2021). The region is exceptionally exposed to climate risk, including rising seas, potentially stronger tropical storms and their attendant wind and flood risks, and extreme heat (Miami–Dade County 2018; Sealey, Burch, and Binder 2018). As a metonymic “risky city,” Miami has become a focal point and laboratory within recent imaginations and experiments in both institutionalized and activist resilience practice (Wakefield 2019; Grove, Cox, and Barnett 2020).

Greater Miami is a key site of contemporary climate gentrification debates, which frequently draw on activist practices, scholarly research, and policy and practitioner debates (e.g., Keenan, Hill, and Gumber 2018; Green 2019; Miami Climate Alliance 2020). The experiences and exposure of Greater Miami’s low-income communities of color have, rightfully, been a focal point of much of this debate to date. Yet, at the same time, the cartography of climate gentrification is arguably unfinished, insofar as it has tended to focus on a narrower set of urban geographies and risk–rent dynamics. In the subsections that follow, we acknowledge and extend this cartography of climate gentrification by mapping how multiple and distinct risk rent dynamics are emerging across various geographies within Greater Miami. The purpose of this vignette-style exploration is neither to capture nor quantify every possible permutation of climate gentrification currently or potentially underway in Greater Miami. Rather, we hope to bring forward-looking insight to bear on how efforts to manage climate risks within distinct real estate–finance relations play out unevenly, and in often contradictory ways, across urban and housing geographies.

The Gentrifying Uplands

Greater Miami’s gentrifying uplands are the focal point of much of the current debate and analysis related to climate gentrification (e.g., Keenan, Hill, and Gumber 2018; Green 2019). Here, land bankers and property developers hedge against declining real estate values on the flood-prone coast by purchasing property in higher elevation neighborhoods. Three risk–rent dynamics underpin the movement of speculative capital and counterresponses from community groups in the gentrifying uplands.

First, speculators increasingly recognize that perceptions of future flood risk—amplified by regular

reports of “sunny day” flooding across the region—may lead to the devaluation of coastal property, putting an increasing share of future rent at risk. McAlpine and Porter (2018) found coastal property in Miami might be trading at a relative discount due to perceptions of flood risk, with up to \$465 million in property value “lost” to risk between 2005 and 2016 (see also Keenan, Hill, and Gumber 2018).

Second, speculators see an opportunity to capture additional rent increments by acquiring and developing property at higher elevations. Low-income communities of color home to Black, Latinx, and Caribbean immigrant communities, including Little Haiti and Allapattah, have registered an influx of property investment, with the latter witnessing fivefold property value increases between 2014 and 2018 (Bojnansky 2019). Local real estate industry actors privately admit that the anticipated costs associated with long-term coastal flood risks enrich the case for upland investment and redevelopment. For example, a participant at our workshop conceded that elevation and floodplain designation (and therefore insurance costs) were material factors in a recent land acquisition and large-scale redevelopment proposal slated for this area.¹

Crucially, climate gentrification plays out on top of—and cannot be empirically separated from—existing patterns of gentrification, which in this context is marked both by large-scale, state-sanctioned redevelopment projects planned for the area, like the billion-dollar Magic City Innovation District in Little Haiti (Page et al. 2019), and by more piecemeal property-by-property acquisitions. For example, the University of Miami Office of Civic and Community Engagement (2015) found that one in five single-family homes and duplexes in Little Haiti are now owned by limited liability corporations (LLCs) and other property investment ownership structures, compared with only 6 percent across Miami–Dade, with homes registered to corporations with names like Premium Elevation LLC (Sisson 2020).² A Miami community organizer engaged in anti-climate gentrification campaigning thus recalled:

We have heard from community members living in Little Haiti and Liberty City that they get knocks on their door and offers to sell their home, and that those offers will often be cash offers that also come with a period of time where they can have free rent in South Dade, so Homestead, for example. (WPBT 2019)

In an area with relatively high housing costs and low incomes, cash purchases can be attractive to

residents. This quote also highlights how speculator steering and regional housing cost dynamics increasingly push low-income residents to exurban areas that have lower direct housing costs yet are also distant from major employment centers, lack affordable public transportation options, and, as in the case of Homestead, might have a greater vulnerability to climate risk relative to upland neighborhoods.

It remains difficult to ascertain the extent to which this wave of gentrification is directly shaped by climate change–attuned investment practices versus other enduring regional property market dynamics, which have seen development pressures steadily push northward from places like Edgewater and Wynwood toward these areas for several years. Beyond capital-driven redevelopment, several neighborhood-specific and state-level housing issues facilitate gentrification in these contexts, including high private rental costs, limited renter protections and housing assistance, and insufficient public housing (Wijburg 2021). Moreover, historical processes of redlining, blockbusting, urban renewal, and violent policing, but also practices of community-building and organizing, have structured patterns of segregation, exposure, and activism in the gentrifying uplands (Mohl 2001; Feldman 2011; Connolly 2014).

However complex these causal relationships might be to tease apart, questions of climate justice, development and redevelopment, investment, and displacement have become tightly interconnected through community organizing (Grove, Cox, and Barnett 2020). Although speculator-driven dynamics make this a story of deepening spatial injustice, it is also one of community resistance and reimagination. A third risk–rent dynamic can be traced here, one articulated through activist calls for integrated climate and housing policies that equitably distribute the costs and benefits of both development and resilience investments. Antigentrification strategies—including mandatory displacement analyses for new developments, enhanced community benefits agreements, and expanded rent controls—have become a key pillar of a broader housing and climate justice agenda pursued by Miami community organizers (e.g., Page et al. 2019; Miami Climate Alliance 2020). Organizing efforts have proved effective at directing public resources in ways that begin to address climate and housing challenges at the same time, as seen in the dedication of \$100 million for

affordable housing investment alongside the sea-level rise mitigation projects within the 2017 Miami Forever municipal bond. The bond planning and implementation process illuminates tensions between activist demands to incorporate “long-excluded issues, experiences, and interests into resilience planning” on the one hand (Grove, Cox, and Barnett 2020, 1615) and, on the other, efforts to channel public investment in ways that secure existing and future real estate rent at risk by assuaging anxious municipal bond rating agencies, reinsurers, and institutional real estate investors (Collier and Cox 2021).

The Citadel by the Sea

Despite the apparent proliferation of flood risk–conscious property market maneuvers in Miami’s gentrifying uplands, coastal areas have remained the primary sites of high-value real estate development in recent years. Through an analysis of local industry trade publications and local property records, we find that no fewer than ninety high-rise residential towers with more than 18,000 units were completed or under construction in coastal areas in Miami–Dade County between 2015 and 2017. This flood of inward investment has consolidated Miami’s property-linked prosperity in a handful of waterfront citadels, which harbor their wealth behind both physical and jurisdictional gates.³

Two risk–rent dynamics animate this striking expansion of luxury housing in areas with substantial hurricane and flood exposure. First, a significant share of Greater Miami’s inward property capital flows remains agnostic to longer term climate risk. This would appear to counter, or partially offset, the coastal property market trends outlined in the first vignette, which McAlpine and Porter (2018) and Keenan, Hill, and Gumber (2018) sought to quantify. Closer inspection of market dynamics within the coastal areas that have experienced most of the high-density, high-value property investment offers insight.

Overseas and individual cash purchases have become even more central to large development finance in Miami in the aftermath of the real estate boom–turned–global financial crisis of the 2000s, after which conventional real estate and finance institutions curtailed their exposure to South Florida real estate. In 2016, 90 percent of Miami–Dade countywide new construction sales were cash deals

(Yun et al. 2017). Foreign buyers, notably but not exclusively from Latin America, paid billions of dollars for relatively high-value property in the region, often as a means to shelter expatriated capital (McPherson 2017; Yun et al. 2017). Institutional capital also retains an important, if more focused, role in financing new development. We identified \$6 billion in short-term development and construction lending flowing from a broad range of local, national, and international financial institutions for fifty of the ninety aforementioned new high-rise developments. Following Conyers, Grant, and Sen Roy (2019), we postulate that the mix of individual and institutional capital financing new development in Miami is relatively short-termist (i.e., limited to, and sheltered by, the truncated terms of development and construction financing), fleeing comparably higher risk political economic contexts (in the case of international cash purchases); sees luxury coastal property as a “crown jewel” to be collected rather than long-term financial investment; or is otherwise transient, such that longer term climate risk remains a secondary consideration within real estate investment decision-making in this market segment.

Second, and by extension, Greater Miami local governments are betting on this near-term influx of real estate capital to plan and finance ambitious climate adaptation projects (Wakefield 2019; Grove, Cox, and Barnett 2020). According to this “densify to defend” adaptation model, the amplification of property value through high-end real estate development will secure the fiscal capacity of local governments to finance risk reduction projects into the future, by both spreading expenses across a broader tax base and increasing public revenue. Nowhere is this model more visible than in Miami Beach, where the local government is raising roads and installing antiflood pumps to keep its \$34.4 billion property tax base—which yielded 51 percent of the city’s 2016–2017 budget—high and dry (City of Miami Beach 2016).⁴ This half-billion-dollar endeavor is one of several risk mitigation projects planned for the barrier island community that collectively seek to sustain near-term waves of property investment. “In this light, Miami’s construction cranes aren’t monuments to climate-change denial. Quite to the contrary—they are the instruments that may, indirectly, allow the city to survive it” (Meyer 2014, 7).

Whereas the first dynamic shows how the vintage of capital flows can sustain near-term risky property market growth, the second demonstrates how local states and aligned private-sector interests seek to

exploit potential rent from new development to secure existing rent at risk through infrastructural interventions. In contrast to the speculator-driven dynamics visible in the first vignette, this represents a local adaptation planning-led form of gentrification, which stands to exacerbate existing patterns of “splintering protectionism” (Johnson 2015) between jurisdictions, with select municipalities able to leverage new property investment to fund adaptation, whereas those unable or unwilling to redevelop face the prospect of disinvestment and devaluation (Shi 2020).

Still-Simmering Suburbia

A third form of insurance-related climate gentrification is emerging in Miami’s still-simmering suburbia, where rising residential policyholder premiums exacerbate long-standing homeowner affordability issues. Given that the wealthiest often self-insure, and that tenants’ insurance is limited in availability, Florida’s multi-billion-dollar annual residential property insurance business is closely linked with middle-income homeownership and single-family residences in particular. Of the \$2.5 trillion total insured exposure backed by the Florida Hurricane Catastrophe Fund⁵ in 2019, \$2.1 trillion corresponded with residential policies (not including condo owners, mobile homes, or tenants), and only \$23.4 billion (or less than 1 percent of the total) was linked to tenants’ policies (Florida Hurricane Catastrophe Fund 2020, exhibit XV).

Property insurance has a Janus-faced character in South Florida: It simultaneously acts as a means to secure rent at risk, yet can serve as the basis for crisis-inducing rent seeking. Unable to fully capitalize themselves against substantial catastrophe losses (like a major hurricane landfall or several consecutive smaller storms), Florida insurers increasingly pass a large share of their residential insured exposure to global reinsurers and specialist investment funds, which in turn offer capital market investors like pension funds access to a growing array of insurance-linked investment asset classes (Taylor 2020). Although this model is increasingly celebrated as a “best practice” for mobilizing “sustainable” capital and environmental, social and corporate governance (ESG) criteria-aligned financing in a wide array of other geographies, it also represents a new form of climate rent seeking. Working across this risk

transfer chain, insurers and their intermediaries capture substantial volumes of commissions, fees, and other revenue against underlying residential policyholders' payments (Johnson 2015; Taylor 2020).

High insurance costs, in part exacerbated by the financial engineering practices of reinsurers, deepen affordability issues for mortgage-holding households. This can be seen in Greater Miami by identifying the geography of cost-burdened households⁶ and examining it against publicly available homeowners' insurance data provided through the Florida Hurricane Catastrophe Fund. American Community Survey data from 2016 reveals twenty ZIP codes in Miami-Dade County where the concentration of cost-burdened, owner-occupied, and mortgage-holding households is at least 50 percent above the countywide average. This baseline housing geography forms a semicircular arc between the gentrifying uplands and citadels by the sea to the Atlantic coast on the east and the Everglades to the west. Just under one quarter of Miami-Dade County residents live in these twenty ZIP codes, yet they are home to more than 40 percent of cost-burdened households.⁷

To understand how the geography of residential insurance costs intersects with that of cost-burdened households in Greater Miami, we conducted a ZIP code-level analysis of the Catastrophe Fund's 2020 proposed rates and actual 2019 insured exposure.⁸ According to the Catastrophe Fund's actuarial methodology, ZIP codes are classified according to twenty-five rating territories, with one being the lowest risk and twenty-five the highest. Ratings ranged from eleven to sixteen in the twenty cost-burdened ZIP codes we identified. Although not the highest risk ratings in Greater Miami, these are high ratings relative to the statewide spatial distribution of exposure and costs.⁹ Assuming a like-for-like property type (e.g., masonry construction) and policy terms across rating territories, a policyholder would be charged approximately \$0.07 per \$1,000 of property exposure in rating Territory 1 and \$0.30 in Territory 5. This captures the rates charged to the least "risky" half of the Florida market. For the selected twenty ZIP codes, however, the rates range from approximately \$0.75 (Territory 11) to \$1.28 (Territory 16), or about eleven to eighteen times the lowest statewide rate. These territorial assignments and insurer levies translate into direct policyholder costs, which are strikingly high in Greater Miami. According to data generated through the Florida

Office of Insurance Regulation's public rate comparison tool, a hypothetical Miami-Dade County home built valued at \$150,000 returned an average quote of \$9,745 per year, with one private insurer asking for \$19,112 per year, exclusive of flood insurance.¹⁰

Although much of the attention on the relationships between insurance and climate risk focuses on flood insurance costs in coastal and riverfront communities (Elliott 2021), here we see a somewhat distinct geography where hurricane risk-driven residential insurance costs converge with Greater Miami's housing affordability crisis.¹¹ This intersection is apparent in inland communities like Miami Gardens, home to several of the aforementioned high-risk and housing cost-burdened ZIP codes. Miami Gardens also is one of the last remaining bastions of middle-income ownership in the region and is Florida's largest Black-majority city. Largely built out at a relatively low density, with a high share of older homes constructed prior to post-Hurricane Andrew building code improvements and aging infrastructure, Miami Gardens and similar communities are unlikely to have sufficient current or future property value to leverage the "densify to defend" model of Miami Beach. In these contexts, individual residential insurance policies play a comparably greater role in financing broader community risk exposure, absent alternative, affordable, and politically viable strategies.

From the vantage of Miami Gardens, we can speculate about the implications of South Florida's insurance-dependent mode of urban climate risk management. Rising insurance costs could significantly erode the financial security and accessibility of homeownership should year-to-year swings in insurance costs continue to significantly outstrip income growth. In 2020, several private residential insurers sought double-digit percentage premium increases and to drop tens of thousands of policies in Greater Miami, in large part to offset insured catastrophe losses following Hurricanes Harvey, Irma, and Maria and other costly industry loss events worldwide (Harris 2020). Additional insurance cost increases, due to both above-average catastrophe losses and changes in National Flood Insurance Program (NFIP) underwriting approaches under Risk Rating 2.0, are likely to sustain insurance cost pressures for South Florida households in coming years (Flavelle 2021).

Against a history in which many Black residents in Greater Miami and beyond have been denied

access to homeownership and housing-based wealth due to racist lending, zoning, and development practices (Mohl 2001; Connolly 2014), the prospect that existing and future homeownership opportunities are winnowed due to rising insurance costs represents a significant social and spatial justice concern (Paganini 2019; Elliott 2021). The existing insurance-led mode of managing residential climate risk exposure sustains current market arrangements and even opens up opportunities for near-term returns for risk capital traders in global reinsurance centers like London and New York. Yet the prospect of endlessly increasing risk rents, absent integrated risk reduction approaches, also raises the specter of housing and community displacement, devaluation, and downgrading in still-simmering suburbia.

Discussion and Conclusion

Studies from Barcelona, Philadelphia, and beyond underscore the importance of climate gentrification as a key driver of contemporary urban conflict and change. We have demonstrated how financialized urban climate risk governance strategies push the gentrification frontier into new physical as well as institutional spaces. This analysis also advances a new facet of climate gentrification studies, given that the climate risk management strategies of real estate and finance institutions—and their impacts on housing markets and urban adaptation pathways—have been understudied. Real estate and finance climate risk management practices (and counterpractices) give rise to new rent dynamics within the built environment, including risk rents, or new forms of value capture that speculate on future risk, and rents at risk, or the anticipated loss of rent due to climate risk and actors' responses to it.

We use the concepts of risk rent and rent at risk to extend the rent gap framework. Indeed, the rent gap continues to serve as a heuristic device to understand gentrification across time and space, not because gentrification is a stable process but rather because gentrification mutates between various decades and places, yet always relies on the extraction of rent through and from the built environment. Hackworth and Smith (2001) theorized these mutations as “waves of gentrification” and have argued that gentrification is expanding to more remote areas, has become more driven by large developers, and is increasingly state-led. More recently, we have

seen gentrification become entangled with the financialization of housing (Lees, Slater, and Wyly 2008) to an extent that it could be argued that gentrification is now increasingly state- and finance-led (Aalbers 2019). Touristification in general and Airbnb in particular are examples of this recent “fifth wave” of gentrification (Wachsmuth and Weisler 2018; Aalbers 2019), but so is climate gentrification.

At first sight, touristification and climate gentrification appear to be very different forms of gentrification with their own set of underlying causes, but in essence both are about widening and exploiting rent gaps in specific locations and market relations that come to be seen as valuable: These processes are seen to increase (or at least secure) the potential ground rent, making it possible to extract more value through the built environment. We can also use the heuristic of the rent gap to see rent at risk as a situation where the potential ground rent may decline, potentially creating a dynamic in which disinvestment—and therefore the switching of capital to other places—is likely or in which new or expanded rent relations emerge to marketize climate risk management. This could result in the downgrading of places, not because of mortgage redlining or blockbusting (which preceded the form of gentrification Neil Smith first wrote about in 1979) but due to the ways in which financialized climate risk strategies increasingly shape the economic viability and inclusivity of real estate markets and communities more broadly (Knuth 2020). Our point is not that these risks are perceived rather than real but rather that the risks are real yet perceived and operationalized in ways defined by, or attuned to, the profit motives and strategies of real estate and finance institutions. In other words, we must not only map urban exposures to climate risk but also seek to understand how these exposures come to be managed through rental relations and how such relations might trigger broader sociospatial changes in particular housing and urban geographies.

The Miami vignettes reveal how capacities to act on understandings of real estate climate risk exposure are variegated in ways that shape differentiated climate gentrification dynamics across space and time. In the gentrifying uplands, speculators wield their capacity to access capital to acquire land and stake out development projects at premium elevations to protect their longer term fortunes against

risk (Keenan, Hill, and Gumber 2018). Yet community organizations continue to mobilize in response to gentrification pressures, articulating alternative valuations of climate risk and securing public responses that (partially) address the unequal distribution of interwoven displacement and disaster exposures (Page et al. 2019; Grove, Cox, and Barnett 2020).

Within the citadel by the sea, the relative risk agnosticism of inward property capital flows speaks to how transnational elites have been able to carve routes for capital to flow into real estate as a (relative) security strategy in a world of political economic risks (Fernandez, Hofman, and Aalbers 2016), yet also shows how the short-termism enmeshed within conventional real estate development and finance arrangements continues to exclude longer term risk considerations, despite growing industry and regulator calls to the contrary. Local government efforts to capture near-term property market growth to finance longer term risk reduction shows a different, albeit truncated and fragmented, form of capacity. Comparably affluent local governments leverage their regulatory and fiscal agency to finance risk reduction infrastructure, fueling a splintering landscape of adaptation investment “commissions” and “omissions” (Anguelovski et al. 2016) that are contoured according to the greatest concentrations of property value at risk.

Finally, in still-simmering suburbia, insurance institutions deploy sophisticated actuarial technologies to craft and capture value from mortgaged housing at risk, shoring up fragile local underwriting conditions in the near term. Yet increasing insurance costs, and the growing infusion of rent-seeking interests within risk capital markets, might foreclose opportunities for affordable and accessible homeownership, eroding the very housing-based welfare system that insurance instruments are designed to secure. These trends expose spatial and temporal justice concerns enmeshed within insurance market structures (Taylor 2020; Elliott 2021) and raise questions about how the housing asset-based welfare strategy that has been a bedrock of public policies in the United States and beyond for more than a half-century will be reformed to address climate change (Kahn 2021).

Although the vignettes foreground dynamics of speculator-, planning-, and insurance-related climate gentrification, respectively, we believe their heuristic value goes beyond the particularities of each case.

Fissures and frictions between capacity, control, and responsibility for urban climate risk governance are markedly visible across the vignettes, for example. Many decisions about how to invest capital in real assets are made by financial institutions far removed from parallel decision making around land use, infrastructure, disaster funding, and other domains that shape physical climate risk management at the household, neighborhood, city, and regional scales. This stubborn point was rehearsed many times in the stakeholder workshop that we hosted, in which prominent “growth machine” actors lamented that many of the critical factors shaping the region’s long-term economic viability were in the hands of London reinsurers and Beltway technocrats, beyond their local realm of influence. Read next to Grove, Cox, and Barnett (2020), this understanding of an absence of local control might also be interpreted as a deferral of responsibility, one that enables powerful property market actors to sidestep more radical demands from Miami climate and housing justice organizers. Yet it also reflects a much broader disjuncture between local climate adaptation governance challenges and the strategies of real estate and finance institutions and their regulators. The Greater Miami case shows how ad hoc state and capital market responses to climate risk at times work in concert to secure high-value property or insurance market stability, yet largely fail to cohere in a clear and integrated strategy for housing accessibility and affordability. Over the longer term, such a failure could lead to a greater magnitude of regional political and economic destabilization that cannot be solved by rising insurance premiums, retrofitting lone assets, raising roads in wealthy neighborhoods, or switching capital from one region to another.

The vignettes also show how climate gentrification is not limited to linear and singular pathways, neighborhood types, or configurations between housing, climate risk exposure, and finance. As we know from both gentrification and postdisaster displacement scholarship, housing dislocation pressures are multifaceted. Our analysis furthers this understanding by emplacing how the characteristics of housing (including both the physical stock and tenure), the local state (including fiscal and planning capacity), and property finance (ranging from annual insurance policies to thirty-year mortgages) come together in complex spatial and temporal patterns that are likely to enable climate gentrification pressures and

processes that vary between cities, neighborhoods, and even households. Relational, spatial, and temporal appraisals of risk–rent dynamics can inspire new and expanded understandings and alignments between housing organizers, residents, climate adaptation planners, and researchers.

We see three opportunities to advance climate gentrification research and mitigation in Greater Miami and beyond. First, additional research can validate and prioritize the emergent risk–rent dynamics (and countermanagement responses) that are most pressing and promising in specific contexts, respectively. Perhaps the greatest hurdle to doing so remains the availability of data, including more granular and open-source climate and catastrophe risk models, and neighborhood-level insurance underwriting data. In the United States, there recently have been widespread calls to make the former available through federal government programs (e.g., Hughes, Giest, and Tozer 2020; Condon 2021), whereas access to the latter could be facilitated through an expansion of existing fair housing finance data disclosure requirements.

Additionally, the risk reduction strategies embedded within existing—if fragmented—disaster finance, spatial planning, institutional real estate investment, and property insurance and reinsurance market structures should be reevaluated and reimaged with a clear focus on housing equity and broader questions of sociospatial justice. Contestation over how to direct proceeds from the Miami Forever bond reveals how ordinary forms of municipal finance are crucial sites for negotiating spatial injustice (Grove, Cox, and Barnett 2020; see also Ponder 2021). Similarly, through the NFIP Community Rating System, individual property owner premiums are reduced if community-level risk management strategies are implemented. This long-existing approach underscores how actuarial technologies and incentives facilitate community-scale climate risk management decisions (Collier and Cox 2021). At the same time, we must recognize how the NFIP and other insurance- or cost–benefit analysis–driven strategies reinforce an individuated and property value–centric paradigm of risk management (Paganini 2019; Elliott 2021; Gray 2021), which can deepen the very sociospatial inequities that undergird climate gentrification. More research and policy experimentation is needed to understand how arrangements within or adjacent to risk financing interface with questions of

spatial and temporal justice and equity. To these ends, the types of policy measures outlined in the Miami Climate Alliance’s (2020) *Housing Justice in the Face of Climate Change* report offer one example of how translocal and cross-cutting equity considerations can be woven into climate risk management strategies and plans.

Finally, real estate and finance institutions and their regulators must contend with how even the most well-intentioned risk management practices can lead to climate gentrification and other inequitable effects and outcomes in cities. Recent regulator and investor calls for climate risk disclosure in financial markets might bring some clarity about a particular investment institution’s physical risk exposure in problem places like Miami, yet disclosure alone will not marshal the capital and capacity needed to realize transformative adaptation in neighborhoods, cities, and regions (see also Shi and Moser 2021). If current real estate and finance climate risk governance approaches are to go beyond tick-box exercises or seeing climate risk as a frontier for rent-seeking or disinvestment, such institutions and their regulators should meaningfully engage with efforts to develop integrated and inclusive urban climate risk management strategies, including those that directly confront the enduring and emergent threats of devaluation, downgrading, and displacement.

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Notes

1. Building outside of floodplains can reduce up-front development costs and is seen to increase the likelihood that assets retain insurability over a longer horizon.
2. LLC ownership structures signal, but do not necessarily confirm, the presence of a developer, investor, or institutional landlord.
3. The recent condominium tower collapse at Surfside is already changing local conversations about high-rise real estate, building regulation, and planning in coastal Florida (e.g., Rojas and Kasakove 2021). Even though the collapse does not appear to be solely related to climate change, it shows how quickly risk–rent perceptions can change in moments of crisis.
4. The “densify to defend” logic also at times infuses debates over the future of neighborhoods in the gentrifying uplands, with higher density redevelopment seen as one means to channel housing growth into relatively “safer” areas.
5. The Florida Hurricane Catastrophe Fund is a state-owned reinsurer that provides mandatory hurricane protection to the state’s property insurers. The fund specializes in mitigating hurricane wind risk within the primary insurance market, which does not include flood risk (underwritten through another public institution, the National Flood Insurance Program).
6. Households in which more than 35 percent of income goes to housing costs.
7. These affordability dynamics are as enduring as they are spatially particular: Nineteen of the twenty ZIP codes had foreclosure rates above the countywide average at the peak of the housing crisis (Miami–Dade County Department of Regulatory and Economic Resources n.d.).
8. The Fund’s rate-making approach and proposed rates are publicly disclosed in an annual actuarial report. Fund rates are calculated and assigned based on several criteria, including policy terms, construction style, insurer participation rate, and ZIP code. Absent publicly available direct underwriting level at the ZIP code level, this provides preliminary insight into the neighborhood-level variability in consumer hurricane reinsurance costs.
9. For example, roughly half of all insured exposure was in territories rated five or lower, and nearly four-fifths rated ten or lower.
10. The CHOICES rate comparison tool is publicly available. Rates were generated assuming \$150,000 property value with no wind mitigation in Miami–Dade County, one of only three scenarios

provided by the tool. This hypothetical property price is well below the market average.

11. Although a comparable analysis of flood insurance costs would invariably be more oriented to low-lying, riverfront, and coastal areas, there are neighborhoods where cost-burdened households will be required to maintain both traditional multiperil policies and flood coverage to comply with mortgage regulations.

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