The Restless Urban Landscape of Housing Financialization: Geographies of Residential Real Estate Investment Trust Expansion in Germany and the United States

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Abstract

The expansion of Residential Real Estate Investment Trusts (R-REITs) represents an important frontier in the financialization of housing and cities. This paper advances the literature on institutional real estate investment and corporate landlordism by analyzing how and where the 15 largest, publicly-listed R-REITS and REIT-like funds in Germany and the US are growing today. First, we introduce the metaphor of the feeding machine to characterize how key actors like the state, private equity, and exchange-traded funds (ETFs) provide R-REITs with the properties, capital, and imperative to grow. Second, we find four geographical expansion strategies at work: (1) investment beyond mainstream asset classes: from multi-family apartments and single-family rentals to student flats, care homes, and mobile home and recreational vehicle sites, (2) the concentration and consolidation of ownership, through mergers and acquisitions and focused investment in select markets, (3) acquisition across national borders, and (4) institution-led new construction. Despite crucial nuances in individual R-REIT strategies and the housing systems of each country, our comparative analysis reveals shared trajectories and rationalities of expansion. We posit that ETFs and the indexes through which they allocate investment increasingly shape the restless urban landscape of R-REIT growth, pumping liquidity into spatially fixed assets.

Key words: real estate, housing, financialization, real estate investment trusts, REITs, investment funds, exchange-traded funds, index funds, private equity, geographical concentration, built-to-rent, corporate landlords, Germany, United States

1. Introduction

In recent years there has been a growing interest in the financialization of housing broadly, and institutional real estate investment and corporate landlordism specifically (Aalbers, 2016; Fields, 2015; Nethercote, 2020; Rolnik, 2013). Residential Real Estate Investment Trusts, or R-REITs, represent an increasingly important set of actors within this story. Non-residential REITs have existed for several decades in the United States and other countries and are now considered a mainstream investment asset class (Aveline-Dubach, 2016; Gotham, 2006; Pereira, 2017; Waldron, 2018). In the new millennium, R-REITs have grown from a minor player in this broader investment landscape into a large sector with reach into a variety of residential spaces (Aalbers et al., 2023; August, 2020; Charles, 2020; García-Lamarca, 2020). From mobile homes in rural Michigan to socially-rented apartments in Berlin, the scope and reach of R-REIT ownership is evolving at rapid pace. This marks a crucial departure from earlier REIT strategies and represents an important frontier in the financialization of housing and cities.

A burgeoning body of scholarship has examined the proliferation of R-REITs and the entry of other types of institutional real estate capital (e.g., private equity, like Blackstone) within residential markets, with a focus on specific cities, individual or subsets of firms, or a single asset type, like single-family rental (Fields, 2018; Immergluck, 2018; Wijburg et al., 2018). These studies often focus on the political-geographical conditions which have enabled institutional capital to flourish within specific housing contexts, including junctures of market restructuring, like the Global Financial Crisis (GFC) of 2007-9 and recent waves of public asset privatization and welfare reform (Bernt et al., 2017; Martínez & Gil, 2022; Wijburg & Aalbers, 2017). Such analyses frequently examine the diversity and agency of investor types, their varied investment strategies and management tools, and the chain of actors they engage with to secure investment in property (Fields & Vergerio, 2022; Magnani & Sanfelici, 2023; Özogul and Tasan-Kok, 2020). Scholars are frequently concerned with questions of housing affordability and tenant rights, (in)equitable neighborhood change and shifting patterns of ownership, and the role of policy interventions in preventing eviction (Charles, 2020; Fields, 2015; Nethercote, 2020; Wijburg et al., 2018).

Focusing on how and where the world's largest publicly-listed R-REITS are growing today, our analysis makes two core contributions to studies of R-REITs and the financialization of housing. First, we introduce the metaphor of the *feeding machine* to characterize how key actors provide R-REITs with the two main ingredients they need to grow: properties and capital. Building on recent debates in urban geography and political economy, we introduce the notion of the feeding machine to aid the conceptualization of how these actors – at times with assets, at times with capital, and at times with crucial market-making capacities – enable R-REIT expansion at specific times and places. We show how both the state and private capital – including real estate private equity (REPE), exchange-traded funds (ETFs) and the institutional investors that invest in them – have acted as feeding machines. Attention to these 'machine' dynamics illuminates why R-REITs are positioned for expansion. As part of the growth imperative, publicly-listed R-REITs and other real estate funds must continuously enroll assets – *but how and where, and how do these trajectories differ or align between geographies?*

Taking up this question, our second core contribution is to map the geographical expansion strategies of the 15 largest publicly-listed R-REITs and REIT-like residential funds in the world's two largest R-REIT markets, the US (n=11) and Germany (n=4). We find four overarching strategies at work, with common yet variegated trajectories between geographies and firms. First, we see a significant portion of R-REITs pushing the investment frontier

beyond initial 'mainstream' asset classes (like higher-end multi-family housing) or sectors that have attracted much of the scholarly attention so far (i.e., single-family rentals in the US and former social housing in Germany). 'New' housing investment domains like mobile home housing, nursing and care homes, and student and employee dormitories comprise a growing share of publicly-listed R-REIT assets held, representing novel forms of financialization and the mainstreaming of hitherto 'marginal' asset classes (Wijburg et al., 2018) that were once the turf of specialist investors who relied far less on institutional investment.

The continued consolidation of residential ownership in R-REIT hands emerges as a second expansion strategy. This is partly marked by efforts to target investment within specific regions and neighborhoods, potentially giving firms greater power to capture higher rents and price appreciation. It is also partly driven by an ongoing process of mergers and acquisitions within the sector, both as large firms merge and as they acquire smaller portfolios from REPE and fellow R-REITs. As a result, we contribute further evidence of concentrated ownership within regions and neighborhoods, where R-REITs may increasingly dominate rental submarkets.

Third, we see R-REIT asset acquisitions transcending national borders to expand. While R-REITs are traditionally circumscribed by national regulations, several firms invest transnationally, particularly in Europe where national markets are smaller than in North America. Fourth, a growing number of R-REITs engage in new construction to grow. While some R-REITs have long developed their own assets, we document new frontiers for 'built-to-rent' schemes. The latter are typically realized through partnerships with major house builders and developers as well as other institutions, such as universities and large employers with dedicated student and employee housing needs.

While many comparative studies often focus on explaining the *differences* between cases, we witness *common*, if nuanced, trajectories and rationalities of R-REIT expansion in the US and Germany. Given the two radically different housing systems and local differences in the roots and early development of R-REITs, this begs explanation. We argue that feeding machines, and in particular the funding machine of ETFs and the market indexes through which they invest, help shape and sustain these common expansion pathways. This does not imply that the outlooks for all R-REITs will be the same, however. By way of discussion, we reflect on several contemporary dynamics that could dislocate some R-REIT investment models, while also unlocking new opportunities for others. Attention to the shifting and sector-specific configuration of feeding machines animates how and where R-REITs can grow. This analysis and approach, we hope, helps scholars to continue to chart the restless urban landscape of housing financialization.

1.1 Methodology

The study utilizes a comparative case study design to assess contemporary frontiers of R-REIT investment. From comparative studies on real estate and urban development financialization, we know that investment processes are variegated, shaped by factors that are deeply rooted within political economies and housing systems, and point to both diversity and commonalities among the strategies and practices of capital providers, asset managers, builders, regulators, and other market-shaping actors (Aalbers, 2017; Byrne, 2020; Fields & Uffer, 2016). Yet we also acknowledge that there may be common drivers, which may be located at other scales (Aalbers, 2022), such as institutional investor demand for globally diversified real estate portfolios. This is not to argue that these common drivers result in

convergence, but rather that there may be 'common trajectories' (Fernandez and Aalbers, 2016; Hay, 2004) in which countries move in the same direction (albeit from a different starting point) and maintain their essential institutional differences.

Working from this comparative perspective, we analyze the residential assets of the 15 largest publicly-listed R-REITs and REIT-like residential funds in the US and Germany (measured in market capitalization at the end of 2020). While public and private R-REITs and similar funds now exist in many countries, the US and Germany represent by far the largest publicly listed R-REIT markets, making them uniquely suited for comparison. Spain, for example, has one of the largest markets for residential REITs in Europe, but its market capitalization of about 6 billion euros in 2019 was merely a tenth of Germany's in the same year (García-Vaquero & Roibás, 2020). In the US and Germany listed R-REITs own many hundreds of thousands of houses – and different types of housing units – across disparate urban and regional contexts (Table 1). While the existing literature has examined specific sub-types of R-REITs, or multiple R-REITs within a specific metropolitan area, we are not aware of a single analysis that looks across the housing assets held by the major publicly-listed R-REITs in the largest markets and compares how firms expand their holdings.

For the US R-REITS, we focus on the eleven largest publicly-listed R-REITs (table 1). While these are not the only public R-REITs in the US, these firms clearly dominate relative to their peers in terms of market capitalization. The US R-REITs have a diversity of business models, histories, and asset class focuses. For the German REIT-like residential funds, we include all four listed funds in the market, the assets of which are primarily formerly socially-rented apartments, which were privatized beginning in the late 1990s, although they are slowly expanding into other asset classes, as we explore below.

We draw on qualitative and quantitative R-REIT firm-level data from the fiscal year ending in 2020 (unless otherwise noted) derived from Refinitiv's Eikon database, individual listed R-REIT annual reports and other self-published material (e.g., investor notices, investments prospectuses) and US Securities Exchange Commission 10-K regulatory filings (for US R-REITs). Using this information, we created an overview of the geographical asset base of each of the firms. However, there is no standard geographical unit through which firms report holdings, with variability in scale (e.g., neighborhood-level or region-level). We therefore also analyzed public NAREIT market index data, press releases from R-REITs and their service providers (e.g., transaction brokers, ratings agencies), and industry media reports. This enabled us to triangulate insights, which we present through a thick descriptive account of R-REIT expansion strategies.

2. R-REIT's Feeding Machines

REITs bring together the worlds of finance and real estate, and have therefore been seen as vehicles of real estate financialization in the urban political economy literature (August, 2020; Aveline-Dubach, 2016; Charles, 2020; García-Lamarca, 2020; Risager, 2021; Sanfelici & Halbert, 2019; Waldron, 2018; Wijburg et al., 2018). For REITs to exist and expand, they require favorable regulation (i.e., enabling legal status and a favorable tax regime), followed by two essential inputs: capital and properties. We contend that REITs access capital and properties through three 'feeding machines' which work together to propel the expansion of REITs: the state, real estate private equity (REPE), and institutional capital channeled through index funds. Conceptually, the feeding machine metaphor helps us to understand how the illiquid asset of real estate becomes not just 'investable' but literally invested as financial actors draw institutional capital into investment vehicles.

R-REIT	Asset Focus	Residential Assets	Market Capitalization*
American Campus Communities**	Student and employee dormitories	102,453 beds in 34,169 units in 150 developments	5.9
American Homes 4 Rent***	Single-family rentals	52,873 single-family homes	9.5
AvalonBay Communities	Multi-family apartments	73,632 units in 249 developments	22.4
Camden Property Trust	Multi-family apartments	56,682 units in 166 developments	10.0
Equity Residential	Multi-family apartments	77,889 units in 304 developments	22.1
Equity Lifestyle Properties	Mobile home and RV communities	153,780 sites (72,737 mobile home / 81,043 RV sites) in 407 developments	11.5
Essex Property Trust	Multi-family apartments	60,272 units in 266 developments	15.4
Invitation Homes	Single-family rentals	80,177 single-family homes	16.8
Mid-America Apartment Communities	Multi-family apartments	100,121 units in 299 developments	14.5
Sun Communities	Mobile home and RV communities	148,925 sites (95,487 mobile homes / 53,438 RV sites) in 309 developments	16.4
UDR	Multi-family apartments	47,641 units in 148 developments	11.4
US total		***954,445 units***	***155.9***
Deutsche Wohnen	Mostly multi-family apartments, but also single-family and commercial rentals	154,600 residential and 2,900 commercial units	16.9
LEG Immobilien	Multi-family apartments	151,121 residential units	10.3
TAG Immobilien	Mostly multi-family apartments, but also commercial rentals	82,545 residential and 1,156 commercial units	4.3
Vonovia	Mostly multi-family apartments, but also commercial rentals and parking spaces	381,264 residential and 6,564 commercial units	38.0
Germany total		***769,530 residential and 10,620 commercial units***	***69.5***

Table 1: Case study R-REITS organized by strategic focus, assets, and market capitalization. *Sources: Eikon, SEC 10-K reports, varied other annual reports.*
*End of Fiscal Year 2020, USD billion) ***Since taken private by Blackstone (2022).*
****Since rebranded as AMH.*

The feeding machine metaphor suggests that each machine may fulfill a specific function for investment instruments like R-REITs. We do not suggest that these machines run on auto-pilot but, rather, are turned on – and can be turned off – by constellations of actors in response to contingencies that enable or constrain investment. Moreover, we recognize limits to the metaphor, which may work well in cases of housing financialization such as mortgage securitization, or in studies that focus on other actors (e.g., property consultants) that push housing financialization, but perhaps less so in other aspects of it.

We use the feeding machine metaphor to organize our literature review and to address two related gaps in this literature. First, scholars have established the role of the state and REPE in the expansion of REITs specifically, and the financialization of real estate in general, yet ETFs and the indexes through which they channel capital into real estate – the final 'machine' – have been understudied. Second, the national and local politics of how R-REITs operate have been analyzed in several studies focused on one of the two case countries (and several others, referenced below), yet internationally comparative studies of REITs are rare. We focus on better understanding how US and German R-REIT expansion is realized through common yet variegated trajectories and rationalities. The machine metaphor aptly captures many aspects of how states, REPE and ETFs constitute and guide REIT operations in multiple and diverse geographies.

As the first feeding machine, states are foundational to the transformation of real estate – an opaque, local, and non-standardized good – into an asset, i.e., an investable and tradable financial product (Fields, 2018; Gotham, 2006; Van Loon & Aalbers, 2017). A growing body of research on real estate financialization "is illuminating complex governance arrangements, an array of state-based entities, and an amorphous boundary between financial institutions and the state" (Pillay Gonzalez, 2023: 2). States facilitate the creation of liquidity out of spatial fixity by introducing regulations that convert illiquid real estate assets into transparent securities (Gotham, 2009; cf. Harvey, 1978), and extending legislation and tax advantages (Gotham, 2006; Waldron, 2018; Tapp, 2020) which enable real estate to be treated as 'just another asset class' (Van Loon & Aalbers, 2017). In many instances, states have directly facilitated the second and third feeding machines by transferring housing assets to REPE and R-REITs, often at substantial volumes and great discounts through the privatization of public and social housing and through fire-sales of distressed properties (Addison & Halbert, 2022; Fields, 2015; García-Lamarca, 2020; Wijburg & Aalbers, 2017).

States can foster the conditions for REPE and R-REIT expansion in several additional ways. Monetary and housing finance policies have permitted and de-risked the entry of private capital into rental markets (Christophers, 2023; Gabor & Kohl, 2022; Wijburg, 2019). Legal procedures like foreclosure and sanctioned contract forms have privileged the (re)entry of investors in distressed housing markets post-GFC (Immergluck, 2018; Teresa, 2022). Relaxations of ownership and rental market controls, in conjunction with the failure of many states to realize social and affordable housing plans at meaningful scale, have also made rental markets more lucrative for investors (Byrne, 2020; Martínez & Gil, 2022). Social welfare policies, like state-guaranteed social security payments and state-backed student loan payments, have provided a reliable flow of income for tenants of 'new' institutional investor asset classes, like mobile-home communities targeting seniors, or student housing, in ways that further de-risk institutional ownership (Aalbers et al., 2023; Bernt et al., 2017). This is not to suggest that states always enable R-REITs, or that the interface between states, REPE, and ETFs look the same in all places. Nuances between, and within, states are crucial and evolve over time, both facilitating and frustrating housing financialization (Aalbers, 2017; Wijburg, 2021).

REPE represents the second REIT feeding machine. Private equity firms, hedge funds and investment banks, like Blackstone, Cerberus, Fortress, Goldman Sachs, and Oaktree, play a great part by buying large portfolios of housing units, many of which are later resold to, or transformed into, R-REITs. REPE investors typically create or purchase portfolios with the aim of selling or spinning them off within a few years at higher price (Fields & Uffer, 2016; Holm, 2010; Wijburg et al., 2018). In other words, they operate on a pure speculation model. In the US, older R-REITs have slowly but steadily expanded by buying existing housing portfolios (often from private R-REITs or smaller landlords) or constructing new housing ('built-to-rent'). Newer R-REITs in the US and all four publicly-listed German R-REITs are reliant on this second feeding machine to supply housing. REPE did not simply sell properties to R-REITs: several R-REITs were formed by REPE institutions when the latter sought to offload properties but found it hard to find buyers for their large portfolios in the wake of the GFC (Wijburg et al, 2018). Transforming their portfolios into R-REITs and taking them public allowed REPE players to find new investors. It is to these new investors that we now turn.

Exchange-traded funds (or ETFs), a type of index fund, constitute a third feeding machine, which could also be called a 'funding machine' Listed R-REITs receive most of their funding from a range of asset managers and funds, often backed by institutional capital like pension funds (deleted self-ref). Representing more than $15 trillion in assets, index funds play a central role in the allocation of capital today (Wigglesworth, 2021). As of 2020, the three largest ETFs – managed by BlackRock, Vanguard, and State Street – are the largest owners of *all* 15 R-REITs introduced in Figure 1 (deleted self-ref), as well as almost all S&P 500 firms (Fichtner et al., 2017).[1] In addition to the three ETFs, a handful of intermediaries – S&P Down Jones, FTSE Russell, and MSCI – steer the larger index market by curating the firms which are tracked by investors. Specialized real estate indexes, like the FTSE EPRA NAREIT Global Real Estate Index and the Dow Jones REIT Index, include hundreds of firms and represent more than $4 trillion of investment (deleted self-ref). Once REITs are included in an index, they receive new investment from index funds proportionate to the growth of the latter's assets under management. This marks an important evolution in terms of how publicly-listed REITs are funded and who owns them (Beckmann et al., 2020), with R-REITs relatively more popular than commercial REITs among institutional investors (Schwartz-Driver, 2008). ETFs invest largely on behalf of pension funds, tax-exempt 401(k) plans, and sovereign wealth funds. Here, too, states sanction and supply this funding architecture with capital (Aalbers et al., 2023).

This return to the role of the state – here, facilitating the mainstreaming of passive investment in R-REITs – speaks to entwined, direct and indirect, links between these three feeding machines. In many cases, the growth of individual R-REITs has been driven by moments of crisis and restructuring – that is, R-REITs have opportunistically taken in capital and properties offered or transferred to them by feeding machines. In recent years, however, two of the feeding machines – REPE and the state – have generally fed fewer properties to R-REITs, while the third feeding machine – ETFs channeling institutional capital – has grown ever-larger (deleted self-ref). ETFs and the indexes through which they allocate investment have become a key driving force of R-REITs expansion, pumping liquidity into spatially fixed assets. Importantly, this has not been a linear, one-way process of machine 'substitution': REPE continues to be in the picture of R-REIT expansion, albeit more indirectly – examples of which we return to in the analysis which follows. The increasing prominence of ETFs suggests that indexed and publicly-listed R-REITs must continuously find strategies to match this influx of capital with risk-returning properties. This, in turn, fosters an imperative to expand to new assets and markets – *but how and where?* In the next section, we take up this question.

3. Geographical Strategies of R-REIT Expansion

Formerly socially-rented apartments in Berlin. Build-to-rent single-family rentals on the edge of Atlanta. Sprawling student housing complexes in Bryan-College Station, Texas. Cul-de-sac mobile home communities in the suburbs of Tampa, Florida. New-built apartments in Wrocław, Poland. Across the US and Germany, the frontiers of R-REIT investment are expanding to new geographies of housing. In this section, we draw on examples from the 15 case R-REITs to identify four cross-cutting expansion strategies: (1) investment beyond mainstream asset classes, (2) geographical concentration and the consolidation of ownership, (3) acquisition across national borders, and (4) institution-led new construction. We distill these categories of expansion by primarily focusing on the evolving *residential asset bases* of R-REITs. We reinforce our findings with insights on market capitalization, investor strategy, and other investment factors. Although the pace, scale, and intensity of each of strategies varies among R-REITs, residential sub-sectors, and urban and (trans-)national geographies, the analysis reveals a degree of commonality in the trajectories and rationalities of expansion today.

3.1 Investment Beyond Mainstream Asset Classes

In the US, the post-1990s story of large R-REIT investment has been marked by a shift from a near-exclusive focus on multi-family apartment housing to a broader range of asset classes like single-family rental and dormitory housing. This evolution can be seen by looking at the market capitalization of R-REITs over time.[2] In 2000, only eight of the eleven case R-REITs were active, of which six focused on multi-family apartments (AvalonBay Communities, Camden Property Trust, Equity Residential, Essex Property Group, Mid-America Apartments, and UDR), and two on mobile homes/RV sites (Equity LifeStyle Properties [ELS] and Sun Communities). The eight firms had a combined market capitalization of $15.7 billion, 92% of which was invested in multi-family R-REITs leasing market-rate 'garden-style' apartments in growth regions, largely in the Southeast and West.

In the wake of the GFC, a new geography of US R-REITs emerged. Primed with an influx of yield-seeking capital (see Fernandez & Aalbers, 2016), the market capitalization of the case firms grew rapidly. Hitherto 'marginal' housing asset classes – those which had eluded large institutional investor interest to date – assumed an increasingly important role in the sector's growth. A new R-REIT, American Campus Communities (ACC), assembled a wide range of assets to the market under the banner of student housing. In the following years, two single-family rental R-REITs also became publicly listed (American Homes 4 Rent [AH4R] in 2013, and Invitation Homes in 2017), following years of asset buying as private firms backed by REPE. Over this period, the two mobile home and RV REITs also grew quickly. By 2020, the US R-REIT cohort had a market capitalization of $155.9 billion – nearly tenfold the value at the turn of the millennium. Multi-family REITs continued to be the bedrock of the sector, with a cumulative market capitalization of $95.7 billion (61% of the cohort), while the newcomers stood at $60.1 billion (39%).

Expansion across multiple asset segments has produced an extensive if uneven geography of R-REIT housing investment across the US, with nearly one million residential units under the control of the case firms by 2020 (Table 1).[3] There are two remarkable features of this geography. First, while some R-REITs target only a handful of states (and, within those states, focus on large urban centers), others invest in a great number of locations. For example, Essex Property Trust focuses on multi-family investment in four metropolitan areas in two states, while the mobile home and RV REITs (Sun Communities and ELS) own assets in 30 or more states and Canadian provinces.

Second, recent investment strategies also include the purchase of materially different types of properties, backed by diverse approaches to expansion. Contrast, for example, the recent investment focus of Camden Property Trust with that of ACC. The former has tended to invest in urban developments with a relatively uniform set of design features, amenities, location types, and targets renters: initially suburban apartments, and more recently also mid-rise inner-city projects. ACC has assembled their student housing portfolio from a wide and sometimes surprising stock of existing housing, ranging from refurbished garden-style apartments to suburban townhomes, in addition to buying existing campus dorms and building new ones. The contrast between Camden and ACC is also reflected in their diverging growth trajectories: while Camden has maintained its core strategy, ACC has looked beyond piecemeal acquisition of existing properties or student-only projects as they expand. For example, ACC and the Walt Disney Corporation are co-developing a 10,000-bed employee dormitory complex near Orlando, Florida.

In Germany, the story of the sector's expansion is more straightforward, given that investment in former social housing has largely dominated the sector to date, and that the four main R-REIT-like institutions emerged as major actors much more recently. The first two of the four large firms – Deutsche Wohnen (DW) and TAG – had a combined market capitalization of only $1.5 billion in 2010. This quickly changed in subsequent years, as LEG and Vonovia entered the market, and all four firms swiftly acquired more assets, primarily through mergers and acquisitions. The market capitalization of the four firms ballooned to $69.3 billion by 2020 – an impressive 46-fold increase in just ten years.

The German firms' collective geography of growth provides an overview of where social housing privatizations took place: throughout the country but with over-concentrations particularly in the large state of North Rhine-Westphalia (NRW), the city state of Berlin, mid-sized cities like Dresden and Kiel, and small cities like Gera and Salzgitter. Some of the firms focus on larger cities, while others are more prominent in mid-size and small cities. Although funds like LEG and DW remain strong in their home regions, they have expanded and diversified their portfolios primarily in other regions. For example, LEG is growing exclusively in West-Germany but 80% of acquisitions are outside its home region of NRW, whereas DW focuses on second-tier cities in both East- and West-Germany.

In contrast to the US, German R-REITs focus primarily on 'affordable' housing, in part a legacy of buying social housing portfolios, but also a result of German rental regulation that aims to keep many of these apartments affordable. The average LEG apartment, for example, goes for €380 per month. This does not imply German R-REITs do not intend to hike rents: they do this for market-rate housing, and they also make use of modernization and sustainability subsidy schemes to increase rents after investment (Unger, 2016; Wijburg et al., 2018). DW is unique in expanding into nursing homes: through two wholly owned subsidiaries it owns 76 facilities with over 10,000 beds in 11 states (largely in West-Germany), which contribute 11.4% to annual earnings. Half of the nursing facilities are operated by DW's wholly-owned subsidiary and half by various external operators on a long-term basis. This suggests DW is working on a more diverse portfolio in which affordable housing remains dominant but increasingly less so.

Overall, the case R-REITs are less diversified in Germany than in the US. A caveat is important here: when comparing four to eleven R-REITs, it is to be expected that there is more diversification within the larger group. Furthermore, German R-REITs tend to be younger and diversification in the US happened over time. This does not imply that diversification in Germany is only a matter of scale and time. The opportunities that R-REITs were presented with in the US will not necessarily arise in Germany, and even if they do,

they may not necessarily have the required risk-return profile. Furthermore, there may be too few mobile home and RV sites in Germany to present a viable market for these asset classes, but it would be too easy to conclude the same for student dorms and single-family homes.

3.2 Geographical Concentration and Market Consolidation

We observe several dynamics that appear to consolidate geographies of R-REIT ownership. This is partly fueled by the deepening of existing patterns of concentrated investment in specific regions, metropolitan areas, and even neighborhoods. It is also partly driven by mergers and acquisitions within the sector, both as large firms merge and as they acquire smaller portfolios, particularly in Germany.

While US and German R-REITs have substantially different business models and acquisition histories, the geographies of their assets reveal how several firms' strategies have led to a concentration of ownership in specific places. This is clearly illustrated by the CEO of single-family R-REIT Invitation Homes, who characterized their investment strategy as being "location-specific, channel agnostic" (Kiesche, 2021). Such strategies have been extensively documented for single-family REIT geographies in US Sunbelt markets like Atlanta (Charles, 2020; Chilton et al., 2018; Colburn et al., 2021; Fields & Vergerio, 2022).

In addition to single-family REITs, we observe that targeted investment strategies also guide other R-REITs. For example, Essex owns over 12,700 apartment units in the Greater Seattle area, nearly 3,000 of which are in Bellevue, a prosperous suburb home to several well-paying technology firms. Essex's holdings account for approximately 15% of all 20+ unit multi-family housing in Bellevue based on American Community Survey estimates. More refined analysis may find Essex has a substantially higher capture of the local market (in terms of comparable housing typology, amenities, and rents). This tracks with the findings of St-Hilaire et al. (2023), who map the spatial concentration of financialized high-cost housing in Montreal.

Similarly, ACC owns or holds long-term leases on 38 housing facilities with more than 26,000 beds across Texas, typically affiliated with or located in communities with large public universities. These facilities are often found in small communities on the outskirts of larger metropolitan areas (e.g., three facilities in Denton near Dallas-Fort Worth, or four facilities in San Marcos, near Austin, Texas), or in small- and medium-sized metropolitan areas like Lubbock, Texas (six facilities) and Bryan-College Station, Texas (six facilities). Taken as an overall share of the housing available to, and marketed towards, students, ACC consolidates a powerful landlord position within local housing segments. ACC's strategy is in line with a larger trend in financialized 'studentification' (Revington & Benhocine, 2023).

Parallels may be drawn from the mobile home R-REITs, which have the most geographically expansive portfolios yet often own multiple or very large residential parks in communities, making them crucial players in local housing markets. ELS leases nearly 2,900 mobile home sites, a large share of housing in the fast-growing exurb of Ellenton, Florida. Located in the Tampa Bay region, Ellenton and similar Sunbelt communities in Florida, Arizona, and elsewhere are popular destinations for retirees.

The four German R-REITs combined own and operate nearly 800,000 units. Together they own assets in every German state, but their geography of growth is remarkably different. As of January 2021, more than 90% of LEG units were in NRW, a state of nearly 18 million people in the west of the country that includes the Rhine-Ruhr conurbation of 10.7 million inhabitants as well as two of the 'Big 7 cities' (see below), but by the end of that year it had expanded so fast in other regions that the NRW concentration was down to 80%. Nearly

three-quarters of DW's units are in Berlin, in contrast. Both firms primarily expand outside their home regions: LEG does so exclusively in West-Germany, whereas DW focuses on second-tier cities, particularly in East- (e.g., Dresden and Leipzig) but also in West-Germany (e.g., Frankfurt and Mainz).

The other two German funds have a more geographically diversified portfolio. Three quarters of TAG units are in several East-German cities including Erfurt (13.2%), Berlin (12.6%), and Leipzig (12%), as well as in small West-German cities such as Gera (11.4%) and Salzgitter (11%), where it owns roughly one in every five housing units. Moreover, TAG's ownership is concentrated in specific neighborhoods where it has a quasi-monopoly on rental housing. Vonovia, the biggest of the German R-REITs, is the only truly geographically diversified company, with 92% of their units in 15 urban areas, including larger concentrations in Berlin and NRW.

Although the geographic focus of German R-REITs is primarily a result of the first feeding machine (the state) privatizing social housing in specific locations, more recent acquisitions and new construction reflect strategic investment in key growth cities, sometimes referred to as the 'Big 7' – in alphabetical order: Berlin, Cologne, Düsseldorf, Frankfurt, Hamburg, Munich, and Stuttgart – reflecting the polycentricity of the German urban system with key economic roles spread among a set of large cities rather than concentrated in prime cities that dominate economic activity and real estate investment nationally, as in Paris or London. Furthermore, as in the US, we find evidence of spatially-focused investment in specific asset sub-types, neighborhood types, and metropolitan region contexts: typically, multi-family housing in post-war era residential areas.

The story of concentrated asset ownership in the R-REIT sector also plays out through the ongoing consolidation of portfolios and funds. This is striking in Germany, where a prior wave of mergers yielded the consolidation of the four case R-REITs (Wijburg & Aalbers, 2017). Vonovia, the largest of them, was formed in 2015 through a merger of Deutsche Annington (previously the REPE arm of UK-based Terra Firma, and itself the result of several mergers and acquisitions, including the acquisition of 11,000 former social housing units from the US-based real estate consultancy and housing constructor Vitus Group) and Gagfah (the German REPE arm of US-based Fortress). In 2018, Vonovia acquired the Austrian fund BUWOG. After several failed attempts by market-leader Vonovia to acquire DW, it finally managed to do so in late 2021, with a merger concluded in 2023. DW itself is the result of a wave of mergers, consolidating the former REPE portfolios of US-based Oaktree Capital, Cerberus, and Whitehall (a Goldman Sachs subsidiary).[4] Vonovia, which to our knowledge is already the world's largest landlord, is becoming ever larger since the merger with DW, and was expected to own some 700,000 housing units by the end of 2023.

In the US context, rounds of consolidation have also shaped the growth trajectories of the largest public R-REITs, with thousands of assets moving from REPE to R-REITs, through R-REIT buy-outs, and from the selective re-privatization of R-REITs by REPE. The first dynamic has been prominent in the context of the single-family rental market. At the end of 2015, AH4R announced a merger with competitor American Residential, adding nearly 9,000 homes in 12 markets, for a combined portfolio of roughly 47,000 rentals. Invitation Homes added 32,000 single-family rentals to its existing portfolio of 50,000 homes when it merged with another R-REIT, Starwood Waypoint in 2017 – itself formed by a prior merger of two other R-REITs, Starwood Waypoint and Colony American. Major mergers and acquisitions have also fueled expansion in other residential asset classes: Essex nearly doubled in size when it acquired rival BRE's entire portfolio of more than 21,000 apartments in 2014, for example. Two years later, Mid America merged with competitor Post, leading to

a combined entity with over 100,000 units – the largest multi-family R-REIT – with most residential assets in Georgia, Texas, the Carolinas, and Florida. That same year, Sun Communities purchased nearly 28,000 mobile home and RV sites from Centerbridge Capital, pushing their portfolio over 100,000 sites.

At the same time, segments of the public R-REIT landscape have been (re-)privatized in recent years, marking a different kind of consolidation: a return of assets to large REPE actors. Notably, Blackstone entered the student housing market by taking the entirety of ACC private for $12.8 billion in 2022. Equity Residential also sold a large share of its assets to private capital in prior years, ceding more than 23,000 apartments to Starwood Capital in 2016, and 8,000 units to Goldman Sachs and Greystar in 2013, as examples. In some cases, sales have supplied R-REITs with cash to focus on 'core' market growth. The latter transaction fueled Equity Residential's acquisition of over 21,000 apartments from Archstone, a REIT owned and then liquidated by Lehman Brothers, for example. AvalonBay also participated in this transaction, taking 20,000 apartment units (and a significant development pipeline) from Archstone's portfolio.

In sum, although the origins of R-REITs in the two countries are different, recent acquisitions show some similarities in growth strategies. This is suggestive of a common trajectory towards concentrated, consolidated, and specialized investment in 'hot markets' and especially 'growth cities' and their suburbs. Consolidation underscores an important dimension of R-REIT growth: against prominent industry claims that R-REITs are not significant players in housing markets because their overall (i.e., national) share of asset ownership remains low,[5] more granular analysis underscores the spatial unevenness, and potential concentration, of investment within market niches and between specialized large institutional players. Mergers between R-REITs are more common in Germany than in the US in recent years, which is in part a result of the former being a less mature market and in part a strategy of trying to create economies of scale given lower overall rents and more limits to increasing rents (e.g., rent regulations).

3.3 Asset Acquisition Across National Borders

There is substantial appetite for foreign expansion among German R-REITs. This may come as no surprise as the German home market is much smaller than that of the US. TAG is currently focusing on new construction in Poland by developing more than 12,000 units. TAG acquired Vantage, a Wrocław-based developer, to reach this goal. It sees Poland as a growth market with a shortage of 3.5 million apartments, and concentrates on four growing, second-tier cities including Wrocław, where half of its new units are located. Vonovia is also expanding abroad yet focuses on the acquisition of large portfolios of mostly former social housing. Recent acquisitions include approximately 38,000 units in the three largest Swedish cities and 22,000 in Austria (mostly in Vienna), and a joint venture has been established with Caisse des Dépôts to facilitate growth in France.[6] Vonovia has also signaled intentions to expand to more countries, with the Netherlands specified as a possible target. Whereas Vonovia's foreign expansion remains focused on purchasing existing housing, TAG combines the strategies of expansion abroad and new construction, a point to which we return in the following section.

The US R-REITs, conversely, have been much slower to look abroad for growth opportunities, with the two mobile home/RV R-REITs serving as exceptions. ELS owns a single RV park just over the Canadian border in British Columbia. Sun Communities has been more expansionist, acquiring over 5,000 RV sites in Ontario, Canada. The latter firm

also recently purchased Park Holidays, a UK firm with 42 holiday caravan parks predominantly located on the English coast, but also with 3 parks in Scotland. There were notable examples of cross-border investment flowing in the opposite direction in the years prior to the pandemic, as Canadian REITs chased "bargain-priced rental apartment market south of the border," as phrased by one trade publication (Western Investor, 2019a). Notable Canadian R-REIT forays into US residential have included Milestone (18,000 units in the US South as of 2019), Morguard North American Residential Trust (7,500 units, largely in the Sunbelt as of 2022), and Tricon (which held 7,300 units in the Sunbelt before divesting in 2022).

3.4 Institution-led New Construction

Both German and US R-REITs increasingly look to new construction to grow, albeit not always successfully. Previously, German R-REIT asset growth was primarily fueled by mergers and acquisitions. LEG now builds in small and mid-size West-German cities. DW plans to construct nearly 7,000 units in the 2020s in the Berlin area; a further 11,000 units are planned in other metropolitan areas, such as Leipzig/Halle/Dresden, Munich, Stuttgart, and Frankfurt. DW also plans to build new nursing homes and assisted housing units. Vonovia started developing 14 new neighborhoods with approximately 8,000 apartments and aimed to construct another 47,000 units throughout Germany but ceased all construction 2023 "due to elevated construction costs and interest rates making new projects less economically viable" (S&P Global Ratings, 2023). In several cases Vonovia uses land it already owns in housing estates for new construction, thereby bringing down the costs of land acquisition needed for development. New construction is concentrated in several of the 'Big 7' metropolitan areas, but also includes Dortmund and Leipzig as well as Vienna. The overall investment patterns of the four German funds suggest that Leipzig in East-Germany is considered an attractive market, and in terms of real estate could be considered part of the 'Big 8' markets.

New housing construction also continues to play an important role in feeding the expansion of US R-REITs. Surveying the 2020 annual reports of the 11 firms, no less than 100,000 new housing units were reported to be under development. The recent entry of single-family rental R-REITs and other institutionalized real estate capital into the domain of 'build-to-rent' (BTR) housing marks an evolution in this sub-sector's expansion strategy, which was primarily focused on the acquisition of existing assets through foreclosure proceedings, smaller portfolio purchases, joint ventures, and other strategies (Nethercote, 2020). The window of opportunity for single-family giants to buy existing assets has narrowed in recent years, due to less inventory, rising prices, and greater competition from other buyers, however. In response, AH4R has developed a dual BTR strategy, including self-development and acquisitions directly from third-party developers. This shift is clearly reflected in the housing stock being added to AH4R's portfolio: of more than 2,100 homes purchased in 2020, 1,158 were sourced through their internal new construction program, while 945 came from third party builders or by acquiring existing assets. In 2021, Invitation Homes also announced a partnership to buy up to 7,500 new houses over five years from the PulteGroup, one of the largest US house builders.

In contrast to single-family R-REITs, multi-family firms have long served as integrated developers, owners, and operators of housing. All six US multi-family R-REITs have mature project development pipelines, collectively reporting at least 73 projects with over 22,000 units at the end of 2020.[7] Beyond multi-family, ACC is developing student intern-worker housing in partnership with Walt Disney World, with thousands of beds underway, in addition to other partnerships with several universities. Sun Communities

reports over 10,000 additional mobile home and RV sites available for development, while ELS disclosed plans to develop nearly 6,000 acres of land at 126 existing parks, in addition to new acquisitions.[8]

To summarize, although there are differences between individual R-REITs in their appetite for new construction, in both countries we see that more R-REITs now pursue new construction to expand their portfolios. This comes at a time when foreclosure- and privatization-driven property feeding machines are otherwise stalling – but also when interest rates and other development may constrain construction-led growth strategies.

4. Conclusion

Residential REITs are increasingly important actors in the financialization of housing and cities. Recent years have witnessed a profound expansion in the scale and scope of R-REITs and R-REIT-like funds in terms of their market capitalization and residential asset base. This has been fueled by the interplay between what we call the three 'feeding machines', which provide R-REITs with the capital, assets, and conditions needed for expansion. In the last few years, two of the feeding machines – real estate private equity (REPE) and the state – have fed fewer properties to R-REITs, while the third feeding machine – exchange-traded index funds (ETFs) channeling institutional capital – has pushed R-REITs expansion.

The literature's focus on the first two feeding machines reveals how REITs and other legal-financial instruments are designed and used to *create* liquidity out of spatial fixity (Gotham, 2009; Harvey, 1978). Our addition of a third feeding machine – which may also be called a funding machine – sheds light on how ETFs and market indexes *provide* the necessary liquidity for expansion. Tracking R-REITs on indexes, ETFs channel capital from institutional investors – especially pension funds – into this sector. This generates a structural possibility for sustained R-REIT growth. The Big Three ETFs are also the three largest owners of all fifteen R-REITs we study (deleted self-ref). These feeding machine dynamics mean that R-REITs and other publicly-listed real estate funds are on a constant search for assets with the right risk-return profile. This "restless *urban* landscape" (Knox, 1991) is in part shaped by the restless *financial* landscape of "pension fund capitalism" (Clark, 2000).

Building on this first contribution, we also examined how and where R-REITs expand in the US and Germany, and whether these trajectories align or differ between geographies. Our investigation revealed four cross-cutting expansion strategies, reinforcing and expanding scholarship on the financialization of housing: (1) investment beyond mainstream asset classes, representing novel forms of financialization and the mainstreaming of hitherto 'marginal' asset classes (Wijburg et al., 2018), (2) geographical concentration and the consolidation of ownership, (3) acquisition across national borders, and (4) institution-led new construction. Although the pace, scale, and intensity of each of the four strategies various among R-REITs, residential sub-sectors, and urban and (trans-)national geographies, this approach has allowed us to identify common if nuanced trajectories and rationalities of expansion within the sector's two largest markets.

Beyond the differences in the political economies of the US and Germany, there are notable differences in R-REIT dynamics in the two contexts, which are at least partly an effect of the German market being less 'mature' and smaller in scale. This may explain why US R-REITs as a group tend to be more diversified and why more German R-REITs seek expansion abroad. Yet we also see common dynamics in terms of the consolidation of ownership, a drive to focus acquisition within select 'growth cities', and the increasing importance of new construction, in part to compensate for the 'drying up' of properties

sourced in the aftermath of the post-foreclosure and privatization waves in the respective case countries. Comparative studies often set out to explain differences between places, but we argue it is equally relevant is to explain the remarkable similarities between the cases, despite their rather different roots and initial development stories.

The feeding machines – and especially the increasing relevance of the ETFs and the market indexes through which they invest – help to explain similar growth trajectories of REITs operating in otherwise radically different housing markets. It is important to note that although R-REITs are primarily *national* players, their expansion is fueled by the need of institutional investors to acquire a *globally* diversified portfolio. Investor purchases are likely driving a degree of asset and investment strategy harmonization across markets. This is not to suggest that ETFs alone determine expansion strategies, nor to overstate this harmonization. Our appraisal complements scholarship which documents factors that produce both variegation and standardization in real estate financialization, be it diverse investor strategy (Magnani and Sanfelici, 2023; Özogul and Tasan-Kok, 2020) or the proliferation of digital asset management technologies (Fields & Vegerio, 2022), respectively.

Years of expansion, consolidation, and fine-tuning have created large, highly- and internationally-capitalized, and increasingly-professionalized R-REITs. Yet in reducing socially-rented apartments in Berlin or senior mobile homes in Phoenix to interchangeable rent-bearing market objects, investment strategies often exacerbate social conflict and forms of inequity within urban and residential geographies (Fields & Raymond, 2021; Soederberg, 2020). Specific R-REITs and other large corporate landlords have been shown to be insufficiently responsive to maintenance concerns, increase evictions, drive up rents, and price out non-investor homebuyers (Cooper & Paton, 2021; Fields, 2015; Lima, 2020; Raymond et al., 2021). R-REITs also amplify divisions between the asset-rich and asset-poor, between those able to access the bounties of home ownership and retirement funds that deliver returns through REITs and similar institutional vehicles, and those who cannot. While R-REITs bring these contradictions to the fore, materially and institutionally, states also play crucial roles in fostering these dynamics (deleted self-ref).

There are many potential limits to R-REIT expansion, however. R-REITs could be constrained by rent controls and ceilings, as existing or proposed recently in New York and Germany. This may not fully deter all R-REITs: whereas the REPE model is based on increasing rents and reselling portfolios at a significant premium, many R-REITs already deal with different forms of rent regulation and have demonstrated that this does not need to harm their profit rates (Wijburg et al., 2018). Indeed, German R-REITs see affordable rental housing as a safe market with stable income flows, and in other countries we also see the rise of so-called for-profit social and affordable housing (Bratt & Lew, 2016). Although rents on many units may be moderate, investors factor this into acquisition prices and maintenance and modernization plans. The Berlin Referendum of 2021 that calls on the State of Berlin to renationalize housing may appear to be a large risk for the German R-REITs (Kunze et al., 2022; Kusiak, 2021), but effective nationalization is all but decided and will likely entail substantial R-REIT compensation – unlocking funds that could be directed toward expansion elsewhere.

Monetary policies, including substantial recent interest rate increases in the US and EU, will also continue to contour the expansion prospects for R-REITs. Several R-REITs plan to curtail expansion plans due to interest rates, and some new construction projects have already come to a halt. After several strong years of R-REIT performance, in part due to the pandemic and its aftermath, there are now significant concerns that many portfolios may be overvalued. While inflationary pressures impact housing demand and the broader economy,

the impacts on R-REITs are also unclear. Market proponents argue that residential investment is traditionally a safe counter-cyclical bet relative to peer stocks (e.g., Funari, 2022), but the blurring boundary between housing and finance – indeed, one possible way to define the very financialization of housing – raises questions about the relevance of this distinction.

Growing affordability crises, organized contestation, deteriorating returns, inflationary pressures: these dynamics will mediate how and where R-REITs and the 'machines' which feed them evolve in coming years. Our analysis and approach, we hope, aids efforts to chart the dynamic urban landscape of housing financialization. So long as institutional capital sees housing as a safe bet, we are likely to see feeding machines seek ways to channel investment into residential real estate funds. This suggests R-REITs will continue to acquire assets, and in doing so are likely to continue to transform non-mainstream housing types into 'just another asset class' – and with it, growing and diverse urban geographies.

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Notes

[1] In a recent study, (deleted self-ref) analyzed the financial accounts of the same set of 15 US and German R-REITs at a snapshot in time (March 2021). The study found relatively consistent patterns of institutional ownership of all case firms, with the 'Big Three' ETFs collectively owning on average about 30% of the R-REITs, albeit with German R-REITs having a somewhat lower average share. The study also examined the country of registration of investors in the case firms and found that US-originating capital dominates (accounting for 75-85% of US R-REIT investment, and 30-40% of German R-REIT investment).

[2] Market capitalization refers to the value of all outstanding shares of a company. In the absence of complete and directly comparable long-term asset-level data for all US and German R-REITs, this indicator offers a common and simple way of comparing the overall size and growth trajectory of the sector and firms within it over time. For both US and German firms, we use data compiled from Eikon.

[3] At the US national aggregative level, the housing assets of the 11 US R-REITs are in 39 US states, plus Washington, D.C. and two Canadian provinces (British Columbia and Ontario). The Sunbelt region has disproportionately captured investment: despite accounting for only 42% of the US population, 64% of the case firm assets are located here. We use a twelve-state definition of the Sunbelt, including Alabama, Arizona, California, Florida, Georgia, Louisiana, Mississippi, Nevada, New Mexico, North Carolina, South Carolina, and Texas.

[4] LEG was formed through the transfer of another Whitehall portfolio of some 93,000 assets to a newly established listed real estate fund, which subsequently acquired more housing portfolios.

[5] Public commentary from Blackstone (2023) on the concentration of institutional ownership captures this essence of this counter-argument.

[6] In 2017 Vonovia entered a joint venture with Caisse des Dépôts, a French public sector financial institution sometimes referred to as the 'investment arm' of the French, which includes the financing of social housing construction and the management of regulated savings and pension plans. The joint venture plans to acquire affordable rental housing in France.

[7] These figures include units reported under multiple stages of development, and both consolidated/wholly owned and joint venture developments.

[8] ELS reports that approximately ten mobile home sites can be developed per acre. New mobile home sales offer ELS and Sun Communities a means to enhance ground rent revenue at undeveloped sites and/or under-performing parks.