From Bricks to Blocks: Tokenization and the Financialization of Real Estate[*]

Patrick Augustin,[†] Yihang Chen,[‡] Franklin Qian,[§] and Donghwa Shin[¶]

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Abstract

Tokenization converts real estate into tradable blockchain tokens and promises broader access, continuous trading, and improved liquidity for an otherwise illiquid asset class. We test these claims using a property-level panel of 644 U.S. residential properties, linking on-chain prices, rents, and trades to traditional housing records. Despite frequent trading, token prices add little information and follow, rather than lead, housing fundamentals. Liquidity improves only modestly, and higher returns reflect elevated rental yields and platform design rather than superior performance. Secondary markets exhibit poor market quality, and DeFi collateralization appears to aggravate these frictions. Dispersed ownership also weakens monitoring, introduces intermediary risk, and generates negative neighborhood spillovers. Suggestive evidence from governance-token ownership indicates that governance rights may partially mitigate these monitoring frictions. Overall, tokenization changes the packaging and accessibility of real estate claims more than their underlying economics: market design and governance, not blockchain technology alone, can determine information, liquidity, and real outcomes.

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[†]McGill University and Canadian Derivatives Institute; patrick.augustin@mcgill.ca.

[‡]University of Wisconsin-Madison; chen2743@wisc.edu.

[§]University of North Carolina at Chapel Hill; franklin_qian@kenan-flagler.unc.edu.

[¶]University of North Carolina at Chapel Hill; donghwa_shin@kenan-flagler.unc.edu.

1 Introduction

The tokenization of real-world assets has expanded rapidly in recent years. The value of on-chain tokenized assets has grown from negligible levels in the early 2020s to tens of billions of U.S. dollars today, with industry estimates exceeding $50-60 billion outstanding and projections reaching the trillions over the next decade (Crawley, 2025; Berger, 2023; BCG, 2022).

Real estate provides a natural setting to study tokenization. The U.S. residential housing stock alone is valued at roughly $50 trillion and represents the primary asset for most households, accounting for about 70% of median net worth (Buchak, Matvos, Piskorski, and Seru, 2025). It is also well suited to tokenization because fractional ownership and digital settlement can lower minimum investment sizes and facilitate secondary trading in an otherwise illiquid asset class. Empirically, tokenization generates high-frequency, on-chain records of property characteristics, rents, and trades, enabling property-level measurement of prices, cash flows, and liquidity and allowing us to test whether tokenization changes the economics of real estate investment.

We study the economic effects of tokenizing U.S. residential real estate. Much of the current discourse emphasizes lower transaction costs, broader access, and improved liquidity through fractional ownership, yet these claims rest largely on industry narratives rather than systematic evidence (Sazandrishvili, 2020; Tanveer, Ishaq, and Hoang, 2025; Kreppmeier, Laschinger, Steininger, and Dorfleitner, 2023; El Jaouhari, Samadhiya, Kumar, Chokshi, Šešplaukis, and Raslanas, 2025). Using a hand-collected property-level dataset that links platform disclosures, on-chain transactions, and local housing records, we directly measure how tokenization affects returns, liquidity, price discovery, and neighborhood spillovers.

Conceptually, tokenization is a change in ownership structure, not just a new settlement technology. By dispersing ownership across many small, geographically distant investors while delegating operational control to a centralized sponsor, tokenization deepens the separation of ownership and control and potentially weakens dispersed owners' incentives to monitor operations (Berle and Means, 1932; Alchian and Demsetz, 1972; Jensen and Meckling, 1976). This organizational shift is central for interpreting token prices, liquidity, and real outcomes. More specifically, it provides a unique setting to study how dispersed ownership affects not only the underlying asset but also generates real effects in the surrounding housing market. Economically, tokenization promises better price discovery, liquidity, and access, but also alters incentives and intermediation; we therefore evaluate whether it improves information efficiency, investment performance, tradability, risk pricing, and ultimately real housing outcomes.

We construct a property-level panel of tokenized real estate using RealT, the largest U.S. residential tokenization platform. We select RealT because it follows the dominant acquisition-and-tokenize model, has the longest operating history, the greatest project scale, and provides granular and consistent disclosures on offering terms, property characteristics, realized rents, and on-chain secondary-market trades. These features allow us to directly observe both cash flows and transaction prices at high frequency, measurement that is not feasible on smaller or less transparent platforms, many of which operate at limited scale or provide sparse data.

We merge each tokenized property with CoreLogic deed and tax records to benchmark fundamentals and neighborhood outcomes against the traditional housing market. Our final sample covers 644 properties (2,044 units) tokenized between 2019 and 2024, concentrated in lower-priced, high-yield segments and primarily located in Detroit, Cleveland, and Chicago. These data provide a uniquely rich laboratory to study returns, liquidity, and the real effects of tokenization.

First, examining price discovery, we find that token prices follow rather than lead the local Case-Shiller housing index and contribute little incremental information, indicating that trading does not translate into informed prices. Although tokens trade continuously, vector error-correction models and information-share measures show that nearly all innovations originate in the underlying housing market. We interpret this pattern through classic microstructure theory: liquidity alone does not guarantee information production (Black, 1986; Kyle, 1985), and highly dispersed retail ownership weakens incentives to acquire property-specific information. Consistent with this mechanism, the average number of wallets per project is 573.6 and the average wallet balance per project is only \$327.3, indicating significantly dispersed ownership. Tokenization, therefore, increases trading activity without improving informational efficiency.

Second, we ask whether tokenization meaningfully improves liquidity. Using a difference-in-differences design around tokenization events, we find that turnover rises relative to nearby homes but remains modest in absolute terms ($\approx$8% annually) and far below public securities markets. Thus, fractionalization lowers entry barriers but does not eliminate trading frictions. Consistent with models of speculative or disagreement-driven trade (Scheinkman and Xiong, 2003), token markets exhibit more transactions without deep, continuous liquidity.

Third, we examine whether tokens deliver superior investment performance and what drives yields. Tokens exhibit higher total returns than comparable rental REITs, but this difference is almost entirely explained by elevated rental yields rather than capital gains. Moreover, advertised yields respond strongly to interest rates and platform choices such as reserves, fees, and asset selection. We interpret this through theories of delegated portfolio management and limits to arbitrage (Allen and Gorton, 1993; Shleifer and Vishny, 1997): prices reflect intermediary incentives and funding conditions, not purely fundamentals. Tokenization, therefore, introduces a new layer of intermediation whose design materially shapes valuations.

Fourth, we study collateralization of tokenized real estate. Collateralized borrowing is a core function of tokenized real-world assets and a key way in which tokenization can extend beyond fractional ownership and secondary-market trading. This question is especially important because one of the central frictions in this market is poor secondary-market quality, reflected in low turnover, high volatility, and large price impact. In our setting, collateral use is substantial: the share of token supply posted as collateral is much larger than comparable home-equity borrowing in traditional real estate markets, and borrowing rates exceed HELOC rates. Using staggered collateral-eligibility events associated with the rollout of RealT's lending protocol, we find that eligibility does not improve market quality. Instead, turnover declines while volatility and price impact rise, with the effects strongest shortly after treatment, suggesting that well-designed secondary markets and associated DeFi platforms are essential for the effective functioning of tokenized real estate markets.

Fifth, we study how dispersed ownership affects operational incentives. Because token holders are small and geographically distant while control is centralized at the sponsor, tokenization intensifies the separation of ownership and control (Berle and Means, 1932; Alchian and Demsetz, 1972; Jensen and Meckling, 1976). Consistent with weaker monitoring, we observe compliance failures, sensitivity to platform-level legal shocks, and larger price declines for riskier projects. We interpret these patterns as agency costs arising from passive, fragmented ownership. Tokenization changes not only how assets trade, but also how they are managed.

Finally, we test whether these financial frictions spill over into local housing markets. Using a local difference-in-differences design, we find that homes near tokenized properties experience price declines of 7-8%, concentrated around higher-risk projects and absent for traditional institutional landlords. We interpret these effects as negative neighborhood externalities stemming from weaker maintenance and compliance incentives. Linking financial structure to real outcomes connects tokenization to the broader housing and local public economics literature.

We also provide suggestive evidence on the role of governance rights in tokenized real estate. RealT introduced RealToken Ecosystem Governance (REG) tokens, which provide platform-level voting rights but do not directly distribute property-level cash flows. We find that tokenized properties with a higher fraction of investors who also hold REG are associated with weaker adverse outcomes described above. These patterns are consistent with the interpretation that governance rights may strengthen investor monitoring incentives and help mitigate agency frictions.

Our evidence shows that the benefits of increased access, liquidity and continuous trading promised by tokenization of real world assets can be limited: tokens add trading but not information, improve liquidity only modestly, and prices reflect platform incentives as much as property fundamentals. At the same time, dispersing ownership weakens monitoring and introduces intermediary risk, generating operational failures and measurable neighborhood spillovers. Thus, market design and governance, not blockchain technology alone, determine outcomes.

This paper contributes to the growing literature on the tokenization of real-world assets (RWAs). Existing work primarily documents market structure and trading mechanisms across asset classes, including equities, bonds, and private credit, and studies how blockchain-based markets affect costs and liquidity (Li, 2026; Cong, Landsman, Rabetti, Zhang, and Zhao, 2025; Malinova and Park, 2023; Leung, Ying, and Wan, 2023). More broadly, related research on fractional ownership in private equity, art, and housing shows that subdividing claims can broaden participation but may also introduce coordination frictions and agency problems (Whitaker and Kräussl, 2020; Roth, Schär, and Schöpfer, 2020). We study these trade-offs in real estate, an illiquid and information-sparse asset class where such frictions may be particularly salient.

Within real estate tokenization specifically, empirical evidence remains limited and largely descriptive, focusing on early ownership patterns or primary-market funding (Swinkels, 2023; Kreppmeier, Laschinger, Steininger, and Dorfleitner, 2023). Recent work further examines investor-level trading behavior responses after gaining access to on-chain leverage, showing that leveraged traders increase trading volume and submit more aggressive bids (Huang, Laturnus, and Ruf, 2025). We advance this literature by assembling a property-level dataset that links token issuance and on-chain trading to traditional housing records and measures of management quality. This structure allows us to analyze price discovery, liquidity, agency risk, and neighborhood spillovers within a unified empirical framework.

Our paper also contributes to the real estate asset-pricing literature. A central challenge is that transaction prices and realized cash flows are rarely observed jointly at the property level. Prior work relies on aggregate indices or specialized historical datasets (Demers and

Eisfeldt, 2022; Eichholtz, Korevaar, Lindenthal, and Tallec, 2021; Chambers, Spaenjers, and Steiner, 2021; Sagi, 2021). Tokenization uniquely makes both prices and rents observable at high frequency, allowing us to directly measure property-level returns, liquidity, and risk.

Finally, we relate to the literature on institutional ownership of residential housing. Large landlords can affect local prices, homeownership, and neighborhood quality through management practices and concentrated control (e.g., Austin (2022); Billings and Soliman (2023); Gurun, Wu, Xiao, and Xiao (2023); Gorback, Qian, and Zhu (2025)). We complement this evidence by showing that tokenization, through dispersed ownership and delegated control, can generate similar or larger externalities. Our results link financial ownership structure directly to neighborhood outcomes, highlighting how market design can affect real housing markets.

2 Institutional Background

We study real estate tokenization through the lens of RealT, an early and prominent platform in residential tokenization. Since its inception in 2019, RealT has tokenized more than 700 properties, representing over $130 million in assets and more than 16,000 investors (Kushneryk, 2025).

Our objective in this section is to isolate the institutional features that drive (i) investor rights and control allocation, (ii) net cash-flow claims after fees and operational choices, and (iii) trading and exit constraints. These features determine the scope for potential agency conflicts, the timing and riskiness of payouts, and the frictions that shape liquidity and price formation.

2.1 Legal and economic structure of real estate tokenization

Although tokenization is often described as "owning real estate on the blockchain," the typical token does not convey direct title to the underlying property. Instead, tokens represent claims on a legal entity that owns the property. The relevant economic question is therefore not how property titles are digitized, but what contractual rights investors obtain vis-à-vis the entity that holds those titles.

In the case of RealT, each property is owned by a property-specific legal vehicle, generally organized as a Delaware Series LLC (see RealToken LLC, 2019). The Series LLC structure permits the creation of multiple legally distinct "series" within a single umbrella entity, with each series holding title to one specific property and segregating its assets and liabilities from those of other series. Accordingly, the deed is recorded in the public land registry in the name of the relevant series, not in the name of token holders, who therefore have no *direct* legal claim on the underlying real estate.

Blockchain tokens instead represent fractional membership interests in the corresponding series. Each property (i.e., each series) is associated with a distinct token issuance identified by a unique identification number (UIN), so tokens are not fungible across properties. Within a given series, however, the tokens are homogeneous and fully fungible, with each unit conveying identical pro rata rights to cash flows and governance at the level of the property-owning entity rather than direct ownership of the property itself.

Governance and operations are centralized at the entity level through an operating agreement. Day-to-day management, including leasing, maintenance, and rent collection, is delegated to a property management company, while strategic decisions are overseen by the sponsor or manager of the LLC. Token holders typically have limited involvement beyond voting on a small set of major actions, such as property sales, significant renovations, or changes in property management. Figure 1 provides a visual overview of RealT's tokenized real estate ownership and operational model.

2.2 Cash-flow rights and payout mechanics

Rental income is collected at the property level and first used to cover property taxes, operating expenses, property management costs, and platform fees, with the remaining net income distributed to token holders. RealT reports two prominent fee components: an upfront listing fee embedded in the initial offering price (approximately 10%) and an ongoing fee on rental income (approximately 2%), in addition to third-party property management costs. Token holders therefore receive cash flows only after these deductions, consistent with a residual income structure.

Distributions are typically made at high frequency (e.g., weekly) and settled in stablecoins. The mechanics depend on the blockchain on which the tokens are issued. On Ethereum, rental income is credited to a designated vault and must be actively claimed by investors, introducing timing and transaction-cost considerations. On the Gnosis chain, distributions are executed automatically through periodic transfers (airdrops) to investors' designated income wallets, with payments available in USDC, xDai, or related stablecoin formats. These differences affect how and when investors access cash flows but do not alter the underlying claim.

Importantly, payouts are contingent on realized rental income: if tenants do not pay or expenses exceed income, distributions decline or cease. The advertised yield therefore reflects realized net rental performance rather than a fixed contractual payment. Consequently, token cash flows resemble residual equity claims rather than predetermined or bond-like payments, and how this residual structure translates into observed cash flows, pricing, and liquidity is an empirical question we examine below.

2.3 Issuance and trading mechanics

Tokens are issued through fixed-price primary offerings conducted on the RealT platform. Prospective investors must complete identity verification (know your customer, KYC) and anti-money laundering (AML) screening through third-party service providers and execute the applicable subscription and operating agreements. Upon approval, fractional membership interests in the relevant property-owning series are recorded to whitelisted blockchain addresses associated with each investor, and only approved addresses are permitted to hold or transfer the tokens.

Secondary trading occurs across several venue types rather than on a centralized exchange. On public blockchains, tokens may trade on decentralized exchanges such as Uniswap on Ethereum and Levinswap on the Gnosis chain, where transactions are executed through automated market maker protocols. In addition, RealT operates internal peer-to-peer facilities, including its YAM marketplace and related interfaces such as Swapcat, which allow approved investors to post and execute bilateral trades. Across venues, transfers remain subject to property-level whitelisting, so only verified addresses may participate.

This market design differs from centralized exchanges with consolidated order books and continuous matching. Instead, trading activity is distributed across venues and subject to transfer restrictions and onboarding requirements. While tokenization lowers minimum investment size, these institutional features shape how easily positions can be entered or exited and therefore influence realized liquidity and price formation. Understanding how this issuance and trading structure affects turnover, volatility, and price impact is central to evaluating whether tokenization alters the liquidity of real estate claims.

2.4 Platform design and valuation rules

In addition to market trading, the platform provides administrative valuation benchmarks. Properties are periodically appraised, and these appraisals are used to update indicative token values that serve as reference points for investors and for certain platform-mediated transactions. As a result, price formation reflects not only secondary-market trades but also valuation inputs derived from appraisal-based assessments of underlying property values.

RealT also offers platform-facilitated exit mechanisms alongside decentralized trading. Investors may request to sell tokens back to the platform or participate in issuer-led buyback programs, subject to platform-determined pricing procedures, processing delays, and eligibility conditions. In some cases, canceled or restructured offerings result in voucher-like claims redeemable on the platform. These arrangements provide additional exit channels but rely on platform intermediation rather than continuous market-based price discovery.

Economically, these mechanisms may introduce valuation smoothing. Exit prices can reflect administrative benchmarks rather than purely market-clearing trades, and buybacks may create implicit price floors. While these features may dampen short-term volatility or facilitate exits, they can also slow price discovery and blur the distinction between market-based and platform-determined valuations. Consequently, observed prices may reflect both trading dynamics and administrative rules, a consideration that is important when interpreting returns and liquidity measures.

Tokens are issued on public blockchains, primarily Ethereum and the Gnosis chain, which differ in transaction costs and settlement mechanics. Ethereum transactions generally involve higher fees and manual claiming of certain payments, while the Gnosis chain provides lower-cost transfers and automated distributions. These differences affect the cost and ease with which investors transfer tokens or receive payouts, thereby shaping participation and trading behavior without altering the underlying economic claims.

Because tokens are recorded on public blockchains, they can interact with decentralized finance (DeFi) protocols that support peer-to-peer exchange, liquidity pools, or collateralized lending. Such integrations expand the set of venues through which tokens may trade or be pledged, potentially broadening participation and creating additional uses beyond simple buy-and-hold ownership. At the same time, these activities occur outside the direct control of the platform and introduce additional layers of intermediation that may influence pricing and liquidity.

2.5 Frictions, risks, and unintended consequences

Control rights are concentrated at the level of the sponsoring entity and delegated property managers, while token holders remain largely passive investors. This separation of ownership and control creates the potential for agency conflicts, as intermediaries determine operating expenses, maintenance and renovation decisions, fee structures, and the timing of property sales or other actions that directly affect net cash flows to investors.

Trading may also be shaped by institutional frictions. Activity occurs across multiple venues and remains subject to onboarding requirements and address whitelisting, so participation depends on platform approval and transfer eligibility rather than unrestricted exchange access. These features can affect how easily positions are entered or exited and influence observed liquidity.

Valuation practices introduce additional considerations. Periodic appraisals and platform-mediated transactions rely partly on administrative benchmarks rather than solely on market-clearing prices. Such mechanisms may smooth short-term price movements while slowing the incorporation of new information into prices, potentially affecting measured volatility and price discovery.

Finally, investors remain exposed to operational and contractual risks beyond property fundamentals. Outcomes depend on the performance of property managers, custody arrangements, regulatory compliance, and fee policies, as well as on reserve and maintenance decisions that determine the distribution of net income. These factors may influence realized cash flows independently of underlying rental demand.

Taken together, these channels highlight mechanisms through which token design and platform intermediation may affect trading outcomes and investor experience. These features do not eliminate the potential benefits of fractionalization but indicate that tokenization may introduce new layers of intermediation and market frictions.

2.6 Comparison to traditional vehicles

To place tokenization in context, it is useful to compare these claims with other forms of real estate exposure. Direct property ownership provides full control but requires large capital commitments and involves substantial transaction costs. Public REITs offer diversified exposure and continuous exchange-based trading but provide limited transparency at the level of individual properties. Crowdfunding and private real estate funds enable fractional participation but often involve lockups and limited secondary trading.

Tokenization modifies several of these dimensions simultaneously. Minimum investment sizes are low and cash-flow information is disclosed at high frequency, potentially improving access and transparency. At the same time, trading occurs on fragmented venues and may depend on platform-specific rules and compliance procedures, which can limit liquidity relative to public equities. Governance rights and operational control also tend to remain centralized at the platform or manager level rather than with individual investors.

These institutional differences suggest that tokenization may reduce entry barriers while retaining many of the economic frictions associated with private real estate ownership. It therefore occupies an intermediate position between public market liquidity and private market structure, combining elements of both rather than fully replicating either.

2.7 Why RealT provides a useful empirical laboratory

RealT offers unusually granular observation of property-level ownership. Each token corresponds to fractional membership interests in a single-property vehicle, allowing individual residential assets, rather than diversified portfolios, to be tracked separately. This structure permits analysis at the level of specific properties while still observing market-based trading of fractional claims.

The platform also discloses detailed and frequent cash-flow information. Rental income, expenses, and distributions are recorded at high frequency, and payouts are observable at the token level. These features allow realized returns to be measured directly from underlying property performance rather than inferred from infrequent appraisals or fund-level reports.

Trading activity is similarly transparent. Because ownership and transfers occur on public blockchains, secondary-market transactions generate time-stamped records of prices, quantities, and counterparties. This visibility enables direct measurement of turnover, liquidity, and price formation in a market that would otherwise resemble private real estate trading.

Taken together, these characteristics provide a setting in which both cash flows and trading outcomes are observable at high frequency and at the level of individual properties, offering a degree of measurement rarely available in traditional real estate markets.

2.8 An illustrative example

To illustrate the information environment faced by investors, Figure 2 presents screenshots of a representative property listing on the RealT website. The platform provides standardized disclosures that combine property characteristics, projected financial performance, and tokenization parameters within a single interface. Investors observe the property's physical attributes alongside projected rental income, operating expenses, token price, total token supply, and expected yield, which together summarize both asset fundamentals and the contractual terms of the offering.

Panel A displays the main listing interface for a multi-family residential property (6838 S Ridgeland Ave., Chicago). The page reports the expected income (7.77% annually, excluding capital appreciation), income per token ($3.89 per year), token price ($50.04), total tokens outstanding (14,900), income start date, and asset characteristics including property type, number of units (6), construction year, rental status, and photographs.

Panel B reports the associated financial and contractual details. The platform discloses projected gross rent ($93,600 per year), operating expenses ($2,970 per month), net income ($57,960 per year), total acquisition and reserve costs ($745,596), sourcing and administrative fees, and the implied yield. Additional tabs list the issuing Series LLC, minimum investment amount, offering size, and blockchain identifiers, including smart-contract addresses on Ethereum and Gnosis. Together, these fields document the projected cash flows, token supply, and settlement infrastructure observable to investors prior to purchase.

3 Data and Measurement Framework

Our empirical analysis combines data from tokenized real estate markets with traditional housing records and public-market benchmarks to construct a unified, property-level panel of residential investment performance. Tokenization makes both realized cash flows and secondary-market trading directly observable for individual properties at high frequency, information that is typically unavailable in conventional real estate settings. This joint visibility of fundamentals, income, and prices allows us to measure returns, liquidity, and price dynamics at the level of single residential assets.

3.1 Global landscape of real estate tokenization

The global market for real estate tokenization remains small but growing. Industry estimates place total issuance at roughly $3-4 billion as of the mid-2020s (InsightAce, 2025).

A central challenge for empirical analysis is the absence of a comprehensive, centralized data source. Tokenized offerings are issued across independent platforms with heterogeneous disclosure practices, so market activity cannot be observed directly from a single registry.

To characterize the platform landscape, we conduct a systematic keyword-based search and combine platform information with the partial coverage provided by `RWA.xyz`. Our exercise identifies 29 candidate real estate tokenization platforms, of which 22 provide verifiable platform-level information. These platforms are listed in Internet Appendix Table A.1. Most platforms operate at limited scale or disclose sparse data, leaving only a small subset suitable for systematic empirical analysis. Aggregating across the verified platforms, total identified issuance amounts to approximately $3.19 billion as of January 2026. This figure is comparable to external industry benchmarks (e.g., InsightAce, 2025; Spherical Insights, 2024).

3.2 Platform selection and advantages of RealT tokenization data

We focus on platforms that tokenize individual U.S. residential properties and are accessible to retail investors. This setting allows tokenized assets to be linked to comprehensive housing-market records, including property characteristics and transactions from S&P CoreLogic, enabling direct comparisons with conventional real estate markets.

Within this segment, activity is concentrated in a small number of platforms, most notably Lofty and RealT. Other platforms have issued only a limited number of projects during our sample period, restricting their usefulness for cross-sectional analysis.

A key institutional distinction concerns property acquisition. Lofty primarily fractionalizes properties supplied by existing owners, whereas RealT follows the more common model in which the platform selects and acquires properties directly and finances purchases through primary token offerings. This structure aligns more closely with the dominant business model in the market.

RealT also provides unusually detailed and consistent disclosures on offering terms, property characteristics, rental income, and secondary-market transactions. Combined with its longer operating history and larger project count, these features make RealT a suitable empirical laboratory for studying the economics of residential real estate tokenization.

3.3 Data sources

Real estate tokenization data: We cover all RealT tokenization projects launched before January 1, 2025. For each property, we observe offering and asset characteristics, including launch and rent commencement dates, project type, square footage, unit count, location, and smart-contract addresses on Ethereum and Gnosis (Figure 2). We match properties to local tax assessment records using street addresses to recover additional housing characteristics.

Tokenization also provides frequent information on operating performance. Project histories disclose offering terms, acquisition costs, and updates such as rent adjustments and tenant changes, forming a property-level panel over time. Because rental income is distributed through on-chain transfers, we directly observe realized rental payments at weekly frequency.

We construct secondary-market prices and volumes from all token transactions on Ethereum and Gnosis across four venues: Uniswap, Levinswap, YAM Finance, and Swapcat. Trades are aggregated daily and monthly to compute volume-weighted average prices and volumes. When no trades occur, we carry forward the last observed price and set volume to zero. A more detailed description of the construction of secondary-market trading data and the estimation procedure is provided in Internet Appendix Section A.1.

"Brick-and-mortar" real estate data: Our traditional housing data come from S&P CoreLogic, which aggregates property records from local assessor and recorder offices across the United States. These records provide a comprehensive view of residential properties and their transaction histories in the conventional, non-tokenized housing market.

We use the Deeds file to observe property transactions, including sale prices, transaction dates, buyer and seller identifiers, and sale-type classifications. These data allow us to construct repeat-sales price measures and benchmark tokenized property performance against realized transactions in the broader housing market.

We merge the Deeds and Tax files using CoreLogic's unique property identifier. The Tax file reports housing characteristics, including structure type, size, bedrooms, bathrooms, year built, and lot size. These variables serve as controls for physical attributes and allow comparisons between tokenized and otherwise similar non-tokenized homes.

Public REIT benchmark: We benchmark token price dynamics against the *FTSE Nareit Equity Single Family Homes Price Return Index*, which tracks publicly traded REITs that own and operate portfolios of single-family rental housing (Nareit, 2025). The price-return series captures capital appreciation (excluding dividends) and provides a public-market proxy for changes in the valuation of institutional single-family rental platforms.

The index is concentrated in a small number of large operators, primarily Invitation Homes and American Homes 4 Rent. This concentration makes the series a clean benchmark for professionally managed, large-scale residential rental exposure.

Long-term rental firms: Large-scale long-term rental firms (LTRs) are institutional investors that acquire and operate residential properties as rental units, often managing geographically diversified portfolios. Because their investment model closely resembles that of tokenization platforms, LTR transactions provide a natural benchmark for institutional ownership in traditional housing markets.

Following Gorback, Qian, and Zhu (2025), we construct an LTR registry by identifying parent firms and subsidiaries from industry reports and matching them to aggregated portfolio information. We use this registry to flag property purchases by LTRs in the CoreLogic transactions data.

3.4 Observable features of the tokenized real estate landscape

Our final sample comprises 644 properties tokenized by RealT between April 2019 and December 2024. In Figure 3, we summarize the evolution of tokenization activity. The number of newly launched projects increases sharply over time, rising from three in 2019 to 223 by 2024.

The annual amount raised through associated security token offerings (STOs) grows rapidly during the expansion phase and reaches around $35 million in 2024. Together, these patterns indicate growth along both the extensive margin (number of launches) and the intensive margin (capital raised), even as fundraising varies across years.

Figure 4 describes the spatial footprint of tokenized properties. Panel A maps tokenized units across U.S. cities and shows strong geographic concentration. Panel B zooms in on Detroit. Tokenized properties are not confined to a single neighborhood; they are dispersed across the city and embedded in the broader housing stock.

Table 1 reports summary statistics by launch year, property type, and location. Panel A shows that RealT launched 644 tokenization projects covering 2,044 housing units during 2019–2024. Panel A also highlights the rapid growth in new launches, from 3 projects in 2019 to 223 projects in 2024. The number of tokenized units varies across years because project composition changes over time; years with more multi-unit launches contribute disproportionately to total units.

Panel B reports composition by property type. Single-family properties account for the majority of projects (471 out of 644, including both single-family homes and SFR portfolios). Multi-family properties account for the majority of tokenized units (1,214 out of 2,044, including both multi-family homes and MFR portfolios). Thus, multi-family assets are less frequent at the project level but contribute a disproportionate share of tokenized housing units.

Panel C shows that tokenization is concentrated in a small set of markets. Detroit, Cleveland, and Chicago account for the largest shares of both projects and tokenized units. This concentration is consistent with these markets offering relatively high rental yields. For example, America Mortgages Inc. (2024) ranks Detroit and Cleveland as the top two U.S. cities by gross rental yield.

3.5 Sample characteristics of tokenized real estate projects

Table 2 reports summary statistics for tokenization projects. Panel A summarizes project-level deal terms, fee structure, underlying property characteristics, rental outcomes, and ownership dispersion, while Panel B reports investor-level characteristics. Several patterns stand out.

First, projects are small and concentrated in low-priced properties. The median *total investment* is \$81,248 and the median *property acquisition price* is only \$63,000. This acquisition price is an order of magnitude below the national median sales price of houses sold (MSPUS), which is around \$410,800 as of 2025Q2.[1] The low acquisition prices suggest that the tokenized sample is drawn disproportionately from the low end of the U.S. housing market, which is also the segment where rental yields can appear especially high.

Second, initial yields are unusually high. The mean (median) *initial yield* is 9.99% (9.82%). This magnitude is economically large because the platform-reported initial yield is a *net*

[1]Median Sales Price of Houses Sold for the United States (MSPUS), available from FRED: https://fred.stlouisfed.org/series/MSPUS.

rental yield at launch. For comparison, Demers and Eisfeldt (2022) estimate that net rental yields in the United States are about 4.2% on average. The near-10% net yield in our tokenization sample is therefore remarkable and suggests that tokenization disproportionately targets the high-yield segment of the housing market.

Third, tokenization involves a sizable fee load. The upfront *listing fee* averages 9.97% of total investment, which is large relative to conventional residential brokerage commissions that are often cited in the 5–7% range. In addition, the platform charges a *platform fee* of 2% of gross rental income, and the *property management fee* averages 7.87% of gross income. Taken together, these recurring fees imply roughly 10% of gross rent paid to the platform and the manager, which is comparable to the fee range typically quoted for third-party property management in residential rental markets (often 8–12% of monthly rent), albeit with a different division between the platform and the manager (see Forbes Advisor, 2025).

Fourth, the underlying housing stock is old, consistent with elevated maintenance and compliance risk. The mean property age is 74 years and the median is 81 years, substantially higher than the U.S. housing stock benchmark: the median age of owner-occupied homes is about 40 years (Zhao, 2024). Projects set aside reserves at launch: the mean *initial renovation reserve* is 5.86% of total investment, and the mean *initial maintenance reserve* is 2.63%.

Fifth, the realized vacancy in the observed rental distribution data is low. The mean *vacancy rate* is 3.46%, which is below the U.S. rental vacancy rate series that is around 6% in recent years.[2] Overall, the summary statistics indicate that tokenized projects are characterized by high net advertised yields, economically meaningful fees, and an underlying housing stock that is substantially older (and cheaper) than national benchmarks, consistent with a riskier segment of the housing market.

Finally, token ownership is highly dispersed. At the project level, the median number of token holders is 466.5, and the average wallet balance is only $327.3. At the investor level, the median balance is $432.8, spread across a median of 3.7 tokens, indicating small positions diversified across multiple tokens. Such a high degree of dispersion raises concerns about weak monitoring incentives and motivates our subsequent analyses.

[2] Rental Vacancy Rate in the United States (RRVRUSQ156N), available from FRED: https://fred.stlouisfed.org/series/RRVRUSQ156N.

4 Empirical Evidence on Tokenized Real Estate

Tokenization promises to make residential real estate more accessible, liquid, and transparent by fractionalizing ownership and enabling continuous trading. Whether these features translate into better investment outcomes, however, is ultimately an empirical question.

Fractional ownership and small minimum investments may broaden participation and facilitate trading. At the same time, fragmented venues, platform intermediation, and thin order flow may limit liquidity and weaken price discovery. The net effect on returns and market quality is therefore ambiguous ex ante.

We evaluate five questions. Do tokenized properties deliver competitive or superior returns relative to traditional housing and residential REITs? Do token prices incorporate local housing fundamentals? Does tokenization improve tradability? Which project characteristics determine liquidity and volatility? And does tokenization affect nearby non-tokenized properties? We analyze these questions sequentially, moving from price discovery to performance, liquidity, and broader market effects.

4.1 Price Discovery and Informativeness

A central question is whether token prices incorporate local housing fundamentals. Continuous trading and high-frequency settlement could, in principle, improve price discovery relative to infrequently traded physical housing. If token markets are informative, their prices should move closely with underlying property values rather than behave as noisy or detached financial claims.

Detroit provides a natural laboratory because tokenization activity is concentrated there (Table 1, Panel C), yielding a sufficiently long and liquid time series. We construct an index of Detroit single-family tokens, weighted by their market capitalization, and compare it to the Detroit Case-Shiller house price index.

Panel (a) of Figure 5 shows close comovement between the Detroit token price index and the Detroit Case–Shiller index, consistent with a cointegrating relation between token prices and local housing fundamentals. Panel (b) reports the analogous comparison for listed single-family rental REITs. Because REIT price data are only available at the national level, we compare the REIT index to the aggregate U.S. Case–Shiller index. The alignment is visibly weaker, suggesting that REIT prices track local housing conditions less closely than tokens.

Panels (c) and (d) compare income performance. Realized net rental yields on tokens are high, around 10% throughout much of the sample, whereas REIT dividend yields average only 2-3%. Token investments, therefore, combine housing-like price exposure with substantially higher cash-flow yields.

To quantify price discovery, we estimate a bivariate vector error-correction model (VECM) for the token and Case–Shiller indices.[3] Specifically, we estimate:

$$\Delta p_{CS,t} = \lambda_1(p_{CS,t-1} - \alpha_0 - \alpha_1 p_{Token,t-1}) + \sum_{j=1}^{p-1} \beta_{1j} \Delta p_{CS,t-j} + \sum_{j=1}^{p-1} \delta_{1j} \Delta p_{Token,t-j} + \varepsilon_{1t}$$

$$\Delta p_{Token,t} = \lambda_2 \underbrace{(p_{CS,t-1} - \alpha_0 - \alpha_1 p_{Token,t-1})}_{Cointegrating\ relation} + \sum_{j=1}^{p-1} \beta_{2j} \Delta p_{CS,t-j} + \sum_{j=1}^{p-1} \delta_{2j} \Delta p_{Token,t-j} + \varepsilon_{2t}.$$

where $p_{CS,t}$ and $p_{Token,t}$ denote the log Case–Shiller and value-weighted token price indices. The coefficients α_0 and α_1 define the long-run cointegrating relation, so the term in parentheses represents deviations from the common price trend. The adjustment parameters λ_1 and λ_2 measure how each series responds to such deviations and therefore indicate which market leads price discovery. The lagged difference terms capture short-run dynamics.

These adjustment dynamics provide a direct measure of price discovery. We therefore compute Hasbrouck information shares (Hasbrouck, 1995) and Gonzalo-Granger component shares (Gonzalo and Granger, 1995), which attribute innovations in the common price trend to each series. The corresponding statistics are:

$$HAS_1 = \frac{\lambda_2^2\left(\sigma_1^2 - \frac{\sigma_{12}^2}{\sigma_2^2}\right)}{\lambda_2^2\sigma_1^2 - 2\lambda_1\lambda_2\sigma_{12} + \lambda_1^2\sigma_2^2},\ HAS_2 = \frac{\left(\lambda_2\sigma_1 - \lambda_1\frac{\sigma_{12}}{\sigma_1}\right)^2}{\lambda_2^2\sigma_1^2 - 2\lambda_1\lambda_2\sigma_{12} + \lambda_1^2\sigma_2^2},\ GG = \frac{\lambda_2}{\lambda_2 - \lambda_1},$$

where σ_{ij} denotes the (i,j)-th element of the covariance matrix of innovations $(\varepsilon_{1t}, \varepsilon_{2t})'$.

Table 3, Panel B reports the resulting estimates across alternative specifications. We account for the Case–Shiller index's two-month publication delay by allowing the index to enter with 0 to 2 additional monthly lags.[4] We also report results using both seasonally adjusted and unadjusted indices.

[3]ADF tests, reported in Table 3, Panel A, indicate both series contain unit roots, justifying the VECM specification. Lag length is selected using the BIC, and Johansen tests indicate an optimal lag order of $p = 2$ and a single cointegrating relation ($r = 1$) across all specifications.

[4]S&P CoreLogic notes that Case–Shiller index levels are published with a two-month lag and are released at 9:00 a.m. EST on the last Tuesday of each month; see https://www.spglobal.com/spdji/en/index-family/indicators/sp-cotality-case-shiller/sp-cotality-case-shiller-composite/#overview

Across all specifications, the Case–Shiller index accounts for nearly all price discovery. Hasbrouck information shares for Case–Shiller range from 0.556 to 0.999 and are in most instances above 0.80, while the corresponding shares for tokens are near zero. Similarly, the Gonzalo-Granger component shares are mostly close to one. Thus, innovations to the common trend originate almost entirely in the housing market, and token prices adjust passively to these movements.

This pattern suggests that, despite continuous trading and high realized rental yields, the token market contributes little incremental information about local fundamentals. One plausible explanation is that ownership is highly fragmented, which may weaken investors' incentives to acquire or process property-specific information. More broadly, tokenization appears to improve access and cash-flow yields while leaving price discovery anchored in traditional housing markets. We therefore next study return performance and examine liquidity, volatility, and trading frictions as potential constraints on token market quality.

4.2 Return performance

To assess whether tokenized housing is a viable investment asset, we evaluate the return performance of RealT tokens relative to a close public-market benchmark. Table 4 compares tokens to the FTSE Nareit Equity Single Family Homes Price Return Index, which captures the price performance of listed single-family rental REITs.

A distinctive feature of tokenized real estate is that both prices and cash flows are directly observable at high frequency for individual properties. We observe secondary-market token prices and realized rent distributions, allowing a transparent decomposition of total returns into capital gains and realized net rental yields, an exercise that is rarely feasible in residential real estate research.[5] Our analysis is based on the 625 real estate tokens, out of a total of 644 tokens, for which secondary market transactions are available and historical token prices can therefore be constructed.

At the monthly frequency, we compute capital gains as $P_t/P_{t-1} - 1$, realized net rental

[5] Only a few studies can measure total real estate returns using property-level prices and rents. For example, Chambers, Spaenjers, and Steiner (2021) construct a long-run residential total-return series from property-level rents and transaction prices in the institutional real estate portfolios of four large Oxbridge colleges (1901–1983), and Eichholtz, Korevaar, Lindenthal, and Tallec (2021) estimate residential total returns using house-level rents and sales prices for Paris (1809–1943) and Amsterdam (1900–1979). Conducting analogous analyses for the U.S. residential housing market is difficult because property-level rent data are generally unavailable.

(dividend) yields as D_t/P_{t-1}, and total returns as $(P_t + D_t)/P_{t-1} - 1$, where P_t is the end-of-month price and D_t is net rental income distributed during month t.

Panel A in Table 4 aligns investment horizons at the token level. Because tokens launch at different dates, we compute each token's performance from its launch month through June 2025 and evaluate REIT performance over the same calendar-month window. We summarize results for *All* tokens, *Detroit* tokens, and *Detroit (SFR)* tokens. The Detroit subsamples are useful because Detroit accounts for a large share of issuance and provides a longer time series.

Across all samples, tokens deliver higher average total returns than the matched REIT benchmark. For *All* tokens, mean monthly total returns are 0.956% versus 0.105% for SFR REITs, with similar gaps for *Detroit* (0.993% vs. 0.133%) and *Detroit (SFR)* (0.981% vs. 0.130%). The difference is driven primarily by the cash-flow component: realized net rental yields are materially higher for tokens (e.g., 0.723% per month for *All*) than for SFR REITs (0.251%), while capital gains differ less.

Panel B evaluates performance at the index level. We construct token indices weighted by market capitalization for *All*, *Detroit*, and *Detroit (SFR)* and compare them to the REIT benchmark over a common window (April 2019–June 2025).

Consistent with Panel A, token indices exhibit higher average total returns than the REIT benchmark. Mean monthly total returns are 1.152% (*All*), 1.263% (*Detroit*), and 1.415% (*Detroit (SFR)*), versus 0.819% for SFR REITs, with most of the gap again coming from higher rental yields (0.740–0.800% per month for tokens versus 0.193% for REITs). Token indices also display lower total-return volatility in this sample, which translates into higher Sharpe ratios than the REIT benchmark.

Overall, tokenized housing delivers substantially higher realized income yields and higher average total returns than the listed SFR REIT benchmark in our sample. We next compare these returns to traditional housing-market benchmarks and assess whether performance differences reflect compensation for risk and frictions rather than superior information or liquidity.

4.3 Liquidity and Tradability

Tokenization is often marketed as improving the tradability of real estate by enabling fractional ownership and secondary-market trading. A direct way to evaluate this claim is to measure turnover. If tokenization reduces trading frictions, tokenized properties should transact more frequently than comparable homes in the traditional housing market.

We therefore compare turnover for tokenized properties (treatment) to nearby control properties located within a 200-meter radius. Annual turnover is defined as the number of transactions in a given year divided by the number of properties in the relevant group. Before tokenization, both groups trade in the physical housing market. After tokenization, however, the underlying properties no longer transact directly, so post-event turnover for the treatment group is measured using token-market activity, defined as tokens traded divided by circulating supply.

Table 5 and Figure 6 show that baseline turnover in the housing market is low. Nearby properties trade infrequently, with annual turnover of roughly 3–4%, consistent with housing being an inherently illiquid asset class. Pre-event turnover for properties that later become tokenized is similarly modest, indicating that tokenization begins from assets that rarely trade.

After tokenization, turnover increases relative to the control group. Panel B reports a difference-in-differences estimate of approximately 3.6 percentage points, meaning that tokenized properties experience a larger rise in trading activity than nearby homes. The time-series evidence mirrors this result: turnover for tokenized properties jumps around the event year and remains persistently higher thereafter. This pattern is consistent with tokenization creating an additional trading venue and enabling secondary-market transactions that would not occur in the traditional housing market.

At the same time, the economic magnitude remains modest. Post-tokenization turnover averages about 8% annually (Table 5), indicating that tokenized properties trade more frequently than the underlying housing stock but still infrequently in absolute terms. For comparison, listed U.S. REITs exhibit substantially higher trading intensity. Average daily dollar volume is approximately $10.9 billion relative to a market capitalization of $1.47 trillion, implying daily turnover of roughly 0.7% and annualized turnover near 190% (Nareit, 2025). Relative to these liquid real-estate securities, token markets remain thin.

Even the most active segments of the housing market trade only intermittently. Near the boom peak before the 2007-2009 housing crash, roughly 15% of purchases were resold within two years, and flipper purchases accounted for at most 10% of transactions (Bayer, Geissler, Mangum, and Roberts, 2020). Modern iBuyers turn inventory more quickly, with median holding periods of about 105 days (Buchak, Matvos, Piskorski, and Seru, 2025), but even this pace remains below the trading intensity of liquid securities. Compare this with the post-tokenization turnover of about 8%, which under a constant-hazard (Poisson) model with trading intensity τ maps into an expected holding period of roughly $1/\tau \approx 12.5$ years, while nearby homes with turnover around 3–4% imply holding periods of roughly 25 years or more.

By contrast, liquid financial markets exhibit substantially higher turnover. On the New York Stock Exchange (NYSE), average daily equity trading volume in 2025 was roughly $80.6 billion against a market capitalization of $31.7 trillion, implying an annualized turnover rate on the order of 60-70%.[6] Early empirical evidence in Odean (1999) also documents the average annualized turnover on the NYSE stocks exceeding 75%, reflecting the high frequency of trade activity in equity markets relative to real estate.

Against these benchmarks, token markets remain closer to housing than to liquid securities. Even post-tokenization turnover is modest relative to public markets, indicating that meaningful trading frictions persist. Tokenization therefore improves tradability at the margin but does not eliminate illiquidity in our sample. We next examine cross-sectional determinants of liquidity, including volatility and price impact, to better understand when tokenized assets become meaningfully more liquid.

4.4 Determinants of Market Quality

Motivated by the modest level of secondary-market activity documented in Section 4.3, we examine which project characteristics contribute to higher liquidity and improved market quality. Answering this question is central for evaluating token market design.

Table 6 relates turnover, volatility, and the Amihud price impact measure (Amihud, 2002) to token size, property fundamentals, and information frictions, while absorbing year–month fixed effects. *Turnover (%)* is the annualized turnover rate measured at the monthly frequency. *Volatility* is the average absolute daily log return, and *Amihud* is the average daily ratio of the absolute log return to dollar trading volume ($1,000 unit). In our analysis, to ensure reliable estimation, we require at least 10% of daily observations within each month when computing *Volatility* and *Amihud*, following the liquidity-measure estimation approach in Schwert (2017). Panel A documents the baseline: tokens trade infrequently (average turnover of 7.902%), return volatility (average volatility of 4.814%) is approximately twice

[6] We approximate turnover as Traded Value/Market Capitalization $\approx 20.3/31.7 \approx 64\%$ per year.

that of U.S. stocks[7], price impact is high, with \$1,000 of trading volume associated with a median daily return movement of 77.9%, and both volatility and price impact exhibit substantial cross-sectional dispersion. These differences provide useful variation for identifying the drivers of liquidity and market quality.

First, market size matters. Larger tokens exhibit higher turnover and lower price impact. Lagged log(market capitalization) is positively related to trading activity and negatively related to the Amihud illiquidity measure, with little effect on volatility. Economically, the magnitudes are meaningful: a roughly one standard-deviation increase in lagged log market capitalization raises the turnover by 0.511 percentage points, nearly 6.5% of the sample mean, and reduces Amihud illiquidity by about 17.3%. Larger vehicles therefore provide greater trading capacity and absorb order flow more easily, lowering price impact. This suggests that bundling properties into larger, portfolio-backed tokens can mechanically improve liquidity in otherwise thin markets.

Second, the timeliness of valuation information is central. Tokens whose properties have been appraised more recently trade more actively and display lower volatility and price impact. Years since appraisal is strongly negatively associated with turnover and positively associated with both volatility and illiquidity. Fresh valuation updates likely reduce uncertainty and disagreement about fundamentals, encouraging participation and lowering adverse selection costs. This evidence is consistent with the broader evidence that token prices tend to follow the Case–Shiller index rather than lead it. It is also consistent with standard microstructure models (Kyle, 1985), which suggest that more precise value information lowers information asymmetries and reduces the price impact of trades.

Third, risk characteristics shape trading behavior. Higher initial yields are associated with higher turnover but also greater volatility and price impact. Because high yields plausibly proxy for risk or distressed assets, these tokens may attract more speculative trading, increasing both volume and return variability. This pattern aligns with models of disagreement-driven trade, in which speculative activity raises both turnover and volatility (Scheinkman and Xiong, 2003). Ownership concentration also matters: higher concentration (HHI) is linked to higher volatility and price impact, consistent with thinner effective float.

Taken together, these results point to three forces that govern market quality in tokenized real estate: scale, information, and risk. Liquidity improves when tokens are larger, valuations

[7] Ang, Chen, and Xing (2006) report an average annualized volatility of 36% for U.S. stocks. Assuming 252 trading days per year, this corresponds to an average daily volatility of approximately 2.268%.

are updated more frequently, and ownership is more dispersed, whereas small, stale, or high-yield projects remain comparatively more illiquid.

4.5 Collateralization of Real Estate Tokens

As a real estate tokenization platform, RealT offers both primary-market issuance and a decentralized lending (DeFi) protocol, RealT Money Market (RMM), built on the open-source Aave codebase. Launched in April 2022, RMM allows investors to pledge RealTokens as collateral and borrow stablecoins. More broadly, collateralized borrowing is one of the central functions enabled by the tokenization of real-world assets. The economic value of tokenization lies not only in fractional ownership and secondary-market trading, but also in the ability to transform otherwise illiquid asset claims into collateral that can be deployed in on-chain credit markets.[8] By allowing investors to obtain liquidity without unwinding their positions, collateralization can in principle enhance the capital efficiency and usefulness of the underlying assets.

This function is particularly important in our setting because the previous section documents that the secondary markets for real estate tokens exhibit poor market quality, including low turnover, high volatility, and large price impact. From this perspective, DeFi-based collateralization could potentially mitigate these frictions by giving investors an alternative source of liquidity other than selling in thin secondary markets. At the same time, collateral eligibility may also worsen market quality if it reduces secondary-market float or amplifies leverage-related demand shocks.[9] In this section, we study RMM and examine whether this core function of tokenized real-world assets can mitigate the secondary market frictions.

In April 2022, RealT introduced RMM v2 and began admitting collateral assets on a staggered basis. Panel A of Figure 7 illustrates this rollout. The blue series plots the number of tokens eligible as collateral and exhibits a step-function pattern. The number of eligible tokens increases only modestly during the v2 period, likely because RMM v2 could support at most 128 collateral assets due to gas and operational considerations.[10] This constraint was relaxed with the public launch of RMM v3 in February 2024, following a major technological upgrade. Consistent with this institutional change, the red series in Panel A rises sharply

[8] Collateralized borrowing is not unique to real estate tokens within the broader RWA sector. For example, Kamino Finance accepts tokenized stocks, particularly xStocks, as collateral for stablecoin borrowing.

[9] For example, Pelizzon, Riedel, Simon, and Subrahmanyam (2024) show that the effect of collateral eligibility of Eurozone bonds on liquidity is ambiguous and depends on the type of bond.

[10] https://medium.com/realtplatform/rmm-v3-public-launch-51c8d80d0a55

after the v3 launch, reflecting the broad expansion of collateral eligibility once the capacity constraint was removed.

Another notable pattern is the substantial share of supply posted as collateral. Panel B of Figure 7 plots, for each date, the ratio of collateral posted to total outstanding supply, averaged across tokens that are eligible as collateral on that date. The average ratio remains around 25-35% throughout much of the sample, indicating that a sizeable fraction of outstanding token supply is locked in the lending protocol.

To benchmark the intensity of collateral use in RMM, we compare this collateral-to-total-supply ratio to standard measures of home-equity borrowing in the U.S. household sector. Using the 2022 Survey of Consumer Finances (SCF), 6.9% of U.S. families report having a home equity line of credit (HELOC), 3.5% report having a HELOC with an outstanding balance, and 1.2% report holding a junior-lien (closed-end) mortgage, which closely corresponds to a traditional home equity loan.[11] Relative to these benchmarks, the collateral posted in RMM represents a markedly larger share of outstanding token supply, suggesting that RealToken holders make much more intensive use of collateralized borrowing in this setting than the typical homeowner does in traditional housing finance markets.

In Panel C, we compare the borrowing rate on RMM with the HELOC rate obtained from Bankrate. HELOCs provide a natural benchmark because both HELOCs and RMM extend credit against real estate-related collateral, either directly in the form of physical property or indirectly in the form of real estate tokens. We find that the general trend in borrowing rates is similar through early 2024. Since then, however, the RMM borrowing rate has become substantially higher, indicating a meaningful divergence from rates in the analogous traditional market.

We next examine how becoming eligible as DeFi collateral affects secondary-market trading activity and market quality for the underlying tokens. Following the approach of Pelizzon, Riedel, Simon, and Subrahmanyam (2024), who study the impact of collateral eligibility in the Eurozone bond market, we employ a stacked difference-in-differences (DiD) framework. As Panel A of Figure 7 shows, collateral eligibility is introduced through a sequence of discrete events, and multiple assets can become eligible on the same date. Over our sample period, we identify 23 such events, covering 579 newly eligible assets in total.

[11] These SCF shares are reported for all families. In the same report, the homeownership rate is 66.1%. Converting to a homeowner denominator yields back-of-the-envelope fractions of approximately $6.9/66.1 = 10.4\%$ (HELOC line), $3.5/66.1 = 5.3\%$ (HELOC with balance), and $1.2/66.1 = 1.8\%$ (junior-lien/closed-end loan) among homeowners. All SCF statistics are from `https://www.federalreserve.gov/publications/changes-in-us-family-finances-from-2019-to-2022.htm` (2022 SCF).

For each event date j, we define as treated the assets that become newly eligible on that date, and as controls the assets that are not yet eligible as of that date. As time progresses, control assets that subsequently become eligible exit the control group beginning in the month in which they first become eligible. We then estimate the following stacked DiD specification for three outcomes: *Turnover*, *Log(volatility)*, and *Log(Amihud)*:

$$y_{i,j,t} = \alpha + \beta\, Treatment_{i,j} \times Post_{j,t} + \eta_j \times \gamma_i + \eta_j \times \delta_t + \varepsilon_{i,j,t}, \tag{1}$$

where i indexes tokens, j indexes events, and t indexes quarters relative to the event date. Our baseline specification includes Event×Token fixed effects ($\eta_j \times \gamma_i$), which absorb time-invariant token characteristics within each event stack, and Event×Quarter fixed effects ($\eta_j \times \delta_t$), which absorb event-specific shocks common to all tokens in that stack. We use a ± 4 quarter-window around each event.

Table 7 reports the baseline results. Column (1) shows that annualized turnover decreases by 1.72 percentage points for treated assets relative to controls after eligibility. This magnitude is economically meaningful given that the average annualized turnover is roughly 8%. *Log(volatility)* and *Log(Amihud)* also increase. The estimates imply increases of 20.8% and 35.3%, respectively, relative to the control group (Columns (3) and (5)). To address concerns about region-level time-varying shocks, we replace Event×Quarter fixed effects with Event×Region×Quarter fixed effects, where regions are defined using eight city-based groups. The corresponding estimates in Columns (2), (4), and (6) are similar. Taken together, the evidence suggests that collateral eligibility is associated with lower turnover, higher volatility, and greater price impact for the underlying real estate tokens.

Figure 8 plots the dynamic coefficients from the difference-in-differences specification with Event×Token fixed effects and Event×Quarter fixed effects. Overall, the dynamic estimates are consistent with the parallel trends assumption. Another notable finding is that the effect is strongest shortly after tokens become eligible as collateral, which lends further support to a treatment-effect interpretation.

Overall, the results suggest that DeFi-based collateralization does not mitigate the core secondary-market frictions documented in the previous section: once tokens become pledgeable in RMM, turnover declines while volatility and price impact rise. These findings suggest that the design of real estate tokenization platforms should account for the possibility that introducing collateralized borrowing, although economically important, may further deteriorate the market quality of the underlying tokens.

4.6 Yield Formation

The evidence in Table 2 suggests that tokenized properties advertise high initial net rental yields relative to standard estimates for U.S. housing (Demers and Eisfeldt, 2022). Understanding what drives these yields is important for interpreting token returns: initial yield is both a headline marketing metric and a key input into investor expectations at issuance.

Table 8 examines cross-sectional determinants of initial yield at token launch. The regressions include property-type fixed effects to account for systematic yield differences across property categories and relate initial yields to macroeconomic conditions, project design choices, and asset characteristics.

A quantitatively dominant driver is the interest-rate environment. Initial yields are strongly negatively related to the federal funds rate (FFR), implying that offerings advertise higher yields when safe rates are lower (34 basis points higher when interest rates are one percentage point lower). Adding the FFR in column (2) of Table 8 increases explanatory power to 48.9% based on the adjusted R^2, relative to 3.5% in a model with just property type fixed effects in column (1). This evidence is consistent with a reaching-for-yield channel, whereby issuers and institutional investors tilt issuance and portfolio choice toward higher-yield securities when the risk-free rate is compressed.[12]

Second, project design choices help shape advertised yields mechanically. The reserve ratio (maintenance and renovation reserves scaled by total investment) loads negatively on initial yield in column (3). Setting aside more cash for future upkeep reduces distributable income and therefore lowers the yield that can be promised at launch, whereas thinner reserves can raise advertised yields by allocating less cash to expected future costs. This factor is quantitatively important since a one standard deviation increase in the reserve ratio (%) is associated with a 34 basis points higher initial yield.

Third, higher initial yields are associated with riskier underlying assets and market selection. Property age is positively related to initial yield in column (3), consistent with higher-yield offerings being backed by older homes with greater maintenance uncertainty. Location indicators in columns (6) for Detroit and Cleveland, the cities with the highest tokenization penetration, also load positively, aligning with these cities' high rental-yield profiles and suggesting that platform activity is concentrated in structurally high-yield markets.

[12] Reaching-for-yield has been documented across several settings, including corporate bonds (Becker and Ivashina, 2015; Chen and Choi, 2024), bond funds (Choi and Kronlund, 2018), and decentralized finance (Augustin, Chen-Zhang, and Shin, 2022).

Figure 9 illustrates how these characteristics evolve over time. Initial yields decline as policy rates rise, while reserve shares increase and average property age falls. This pattern is consistent with a shift from early high-yield offerings, supported by low-rate conditions and more aggressive reserve/asset choices, toward more conservative fundamentals as interest rates normalize.

Taken together, the evidence indicates that initial yields reflect both macro conditions and intermediary choices. Yield levels are higher when safe rates are low, and they are further shaped by reserves, asset age, and geographic concentration - features that jointly determine the headline yields observed at issuance.

4.7 Regulatory and Platform Risk

Tokenized real estate claims depend not only on property-level fundamentals but also on the operational and legal standing of the sponsoring platform. Because rent collection, compliance, and distributions are centralized at the intermediary level, enforcement actions or operational disruptions may affect cash flows across many tokens simultaneously. Studying such platform risk is therefore important for understanding how token prices incorporate non-property-specific exposures.

On July 2, 2025, the City of Detroit filed a nuisance-abatement lawsuit against RealT and affiliated entities, alleging widespread housing-code violations and failure to maintain hundreds rental properties (Mondry, 2025; Cwiek, 2025). The complaint seeks portfolio-wide remediation and tenant-protection measures, including compliance upgrades and rent escrow. Because the action targets the platform's management of multiple properties rather than an isolated address, it constitutes a platform-level shock that may affect expected rents, costs, and discount rates across tokens.[13] This governance failure is also consistent with weak platform-level incentives, given that RealT held, on average, only 0.75% of the outstanding supply of RealTokens as of June 30, 2025.

The allegations imply several valuation channels. Increased maintenance and compliance expenditures, potential fines, higher vacancy risk, and operational disruptions can reduce expected net cash flows, while regulatory uncertainty can raise required returns. The lawsuit date therefore provides a natural event to examine whether token prices incorporate platform and legal risk beyond local housing fundamentals.

[13] See *City of Detroit v. Real Token LLC* available at https://outliermedia.org/wp-content/uploads/2025/07/City-v.-Real-Token-Complaint-1-1.pdf).

Panel (a) in Figure 10 plots token prices around the filing date. Token prices decline relative to both Detroit and U.S. Case–Shiller indices, indicating that the repricing is not explained by contemporaneous movements in housing markets. This divergence is consistent with token valuations reflecting intermediary risk that is orthogonal to property-level fundamentals, even though all properties are legally ring-fenced through a property-specific special purpose vehicle.

The price response is more pronounced for Detroit tokens. Column (1) in Table 9 shows that Detroit tokens experience an additional decline of 1.687% relative to non-Detroit tokens in the immediate month post-event window. This difference increases to a differential 4.572% drop over a two-month period, as reported in column (5). This pattern is consistent with a local exposure component, as the enforcement action directly concerns Detroit properties and may increase the likelihood of inspections, remediation orders, fines, or temporary vacancy.

We further examine heterogeneity within Detroit tokens. Tokens with higher initial yields and earlier issuance dates exhibit larger post-event declines, as shown in Panels (b) and (c) of Figure 10 and columns (2) and (3) in Table 9, respectively. The differential magnitude in house price drops ranges between 2% and 4%. These characteristics plausibly proxy for ex-ante risk rather than mispricing, suggesting that investors associate higher yields and early vintages with weaker property or compliance fundamentals.

To assess this interpretation, we use the City's priority classifications. Properties are grouped into three categories based on the severity of code violations and compliance failures. Panel A of Table 10 shows that among 632 tokenized properties in Detroit, 375 (i.e., 60%) fall into one of these three priority groups. Columns (1) and (2) of Panel B further show that earlier vintages and higher-yield properties are more likely to receive such classifications. These patterns indicate that the tokens most exposed to municipal violations experience the largest repricing following the lawsuit. In columns (4) and (5), we find similar results for violations that may directly affect nearby properties, particularly Priority 1 and Priority 2 violations.

Taken together, the evidence suggests that token prices incorporate both property-level risk and intermediary-level risk. Even when ownership is legally separated through property-specific SPVs, platform-wide operational or regulatory shocks can propagate across the entire token universe.

4.8 Spillover Effects on Local Housing Markets

Tokenization may affect welfare not only through investor outcomes but also through local externalities. If tokenized rental properties are associated with weaker maintenance, code noncompliance, or tenant disruption, nearby homeowners may bear costs through reduced neighborhood amenities and perceived safety. This mechanism is particularly plausible when properties exhibit severe habitability or vacancy-related violations (e.g., emergency correction orders or vacant homes open to trespassers), which can generate localized disamenities.

We test for such spillovers by examining transaction prices of nearby, non-tokenized homes around tokenization events in Detroit. Our identification uses a local difference-in-differences design that compares homes within 200 meters of a tokenized property (inner ring) to homes located 200–400 meters away (outer ring) around the same event. The design holds constant neighborhood-level trends and isolates price movements at very short distances, where externalities should be most pronounced.

Specifically, we estimate:

$$\log(Price_{i,j,t}) = \alpha + \beta(\mathit{Treat}_{i,j} \times \mathit{Post}_{j,t}) + \gamma^{\top} X_{i,j,t} + FEs + \varepsilon_{i,j,t}, \tag{2}$$

where $Price_{i,j,t}$ is the transaction price of property i at tokenization event j in year-month t. $\mathit{Treat}_i = 1$ for homes within 200 meters of the tokenized property and $\mathit{Treat}_{i,j} = 0$ for homes in the 200–400 meter ring. $\mathit{Post}_{j,t} = 1$ in years after tokenization and zero otherwise. $X_{i,j,t}$ includes detailed housing characteristics (e.g., age, living area, lot size, bedrooms/bathrooms, and amenities). We absorb event-by-year-month fixed effects and distance-by-event fixed effects, and cluster standard errors at the tokenized-property level. The sample includes four pre-years and five post-years, and we restrict tokenization events to April 2019–October 2023 so that each event has at least two years of post outcomes given transaction data through October 2025. Related local-ring designs are used in the housing literature (e.g., Diamond and McQuade, 2019; Bayer, Mangum, and Roberts, 2021; LaPoint, 2022; Billings and Soliman, 2023; van Binsbergen, Cocco, Grotteria, and Naaraayanan, 2026).

Figure 11 shows no evidence of differential pre-trends between inner- and outer-ring homes in the years prior to tokenization. After tokenization, the event-time coefficients turn negative, indicating that homes nearer to tokenized properties decline in value relative to homes slightly farther away. Table 11 Column (1) summarizes this effect: inner-ring transaction prices fall by 7.8% more than outer-ring prices after tokenization.

The average effect masks substantial heterogeneity. Columns (2)–(5) show that the negative spillover is concentrated among projects that appear ex ante riskier—in particular, high-initial-yield tokenizations (above the sample median) and earlier vintages. For high-yield projects, the estimated inner-minus-outer price effect is -12.1% (versus a statistically insignificant -0.9% for low-yield projects), and for early vintages it is -16.3% (versus a statistically insignificant -1.2% for later vintages). This pattern is consistent with initial yields and early cohorts capturing differences in underlying risk and operational constraints rather than purely reflecting higher expected returns.

To assess whether this heterogeneity aligns with observable compliance risk, we link projects to the City of Detroit's priority classifications from the nuisance-abatement action. Priority 1–2 properties correspond to the most severe cases (e.g., emergency orders, serious habitability concerns, or vacant properties open to trespassers), which are precisely the types of conditions likely to generate neighborhood disamenities. Columns (3)–(4) of Table 9 show that early-vintage and high-initial-yield properties are more likely to fall into Priority 1–2 categories, supporting the interpretation that the spillovers are driven by projects with higher compliance and maintenance risk.

To benchmark these results, we implement the same local-ring design around acquisitions by long-term rental (LTR) firms. Columns (8)–(10) show no evidence of negative spillovers around LTR purchases. This comparison is informative because both tokenization platforms and LTRs convert properties into rentals managed by an intermediary, yet only tokenization exhibits negative local price effects in our sample.

Overall, the evidence suggests that neighborhood spillovers are not an automatic consequence of institutional rental ownership. Instead, they arise in settings where tokenization is associated with elevated compliance and maintenance risk, a mechanism that is most visible for early and high-yield projects.

4.9 Governance Tokens and Monitoring Incentives

In April 2024, RealT introduced the RealToken Ecosystem Governance (REG) token as part of its plan to decentralize the RealToken ecosystem through a decentralized autonomous organization (DAO). REG is not a direct claim on the cash flows of individual tokenized properties. Instead, it allocates platform-level governance rights, including voting on borrowing-rate curves on RMM, fee structures on YAM, DAO budgets, and ecosystem incentives. Thus, whereas property tokens provide economic exposure to specific real estate assets, REG provides voice over the governance of the RealT platform.

The key feature of REG is that it separates governance rights from direct property-level cash-flow rights. This design provides a useful setting for studying whether governance rights affect investor monitoring incentives in tokenized real estate. When property-token holders also hold REG, they combine economic exposure to real estate assets with formal platform-governance rights. Thus, the fraction of REG holders among investors in a given property captures the overlap between cash-flow exposure and governance capacity, or governance-participating ownership.

We examine how this measure relates to token returns after the lawsuit announcement, property-level code violations, and neighborhood spillovers. Columns (4) and (8) of Table 9 show a positive correlation between the fraction of REG holders and token returns. Columns (3) and (6) of Table 10 document a negative relationship between the fraction of REG holders and property code violations. Finally, columns (6) and (7) of Table 11 show that negative neighborhood spillovers are concentrated among tokenized properties with below-median fractions of REG holders. Overall, the evidence suggests that the adverse effects of agency frictions are attenuated for properties with a higher fraction of REG holders.

A plausible interpretation is a governance-rights channel. In RealT, property selection, maintenance, tenant management, legal compliance, and disclosure are largely delegated to the platform or affiliated managers, although this interpretation should remain cautious given the potential endogeneity of governance-token ownership. This separation between dispersed outside investors and control over the underlying real assets creates agency frictions, especially because tokenized real estate investors are geographically dispersed, individually small, and have limited access to property-level information. REG tokens may provide a monitoring channel by giving economically exposed investors a formal mechanism for voice and coordination. Through this channel, REG holders may become better informed about property-level problems and avoid lower-quality properties in equilibrium. Consistent with this interpretation, properties with a higher fraction of REG holders are associated with weaker negative effects after the lawsuit announcement, fewer code violations, and weaker negative spillover effects.

This interpretation is closely related to evidence that governance rights can induce investors to acquire information and monitor. Iliev and Lowry (2015) show that mutual funds' voting decisions reflect the costs and benefits of becoming informed, with funds relying less on proxy-advisor recommendations when the benefits of researching voting items are higher.

Aggarwal, Saffi, and Sturgess (2015) show that institutional investors recall loaned shares before proxy record dates when voting is more valuable, suggesting that investors incur costs to preserve governance rights when monitoring benefits are high. Relatedly, Brav, Cain, and Zytnick (2022) show that retail shareholder voting participation increases with ownership and expected voting benefits and decreases with participation costs. Our setting extends this logic to tokenized real estate: REG tokens provide governance rights, and these rights should be most effective when held by investors who are also economically exposed to the relevant property.

5 Conclusion

This paper studies the economic effects of residential real estate tokenization using a unique, hand-collected dataset that combines more than 600 tokenized projects with on-chain trading records, realized rental distributions, and matched local housing transactions. The setting is unusual in that it makes both cash flows and secondary-market prices observable at high frequency for individual properties, objects that are rarely jointly observable in traditional real estate markets. This data structure allows us to measure returns, liquidity, price discovery, and neighborhood outcomes within a unified, property-level framework.

Conceptually, tokenization represents a change in the organization of ownership rather than merely a technological change in settlement. By dispersing ownership across many small, geographically distant investors while delegating operational control to a centralized sponsor, tokenization intensifies the classical separation of ownership and control (Berle and Means, 1932; Jensen and Meckling, 1976) and weakens the incentives of dispersed owners to monitor operations (Alchian and Demsetz, 1972). Consistent with these theories, we document evidence of monitoring frictions, compliance risk, and platform-level shocks that affect many tokens simultaneously.

At the same time, although tokenization introduces secondary market trading, token prices largely follow local housing fundamentals rather than lead them. This pattern is consistent with microstructure models in which price discovery requires informed trading rather than trading volume per se (Kyle, 1985): markets can exhibit frequent transactions yet contribute little independent information to prices. It is also consistent with models of speculative trade in which disagreement among investors generates volume and volatility without necessarily improving informational efficiency (Scheinkman and Xiong, 2003).

In our early-stage market, tokenization lowers entry barriers and increases transparency of cash flows, but liquidity improvements remain modest and new intermediary risks emerge. Token turnover averages about 8% annually, already thin and illiquid secondary markets are further impaired by DeFi collateralization, platform-wide events propagate across tokens, and higher-yield projects are associated with greater operational and neighborhood risk. These findings indicate that tokenization changes the packaging and accessibility of real estate claims more than their underlying economic risks.

From a policy and market-design perspective, improving outcomes likely depends less on trading technology itself and more on governance and incentives, such as stronger maintenance standards, transparent reserves and fees, credible valuation updates, and oversight mechanisms that align sponsor behavior with property quality and local welfare.

Our analysis provides suggestive evidence consistent with this view. Properties with a higher fraction of investors holding governance tokens experience weaker adverse outcomes, including smaller return declines after the lawsuit announcement, fewer code violations, and more limited neighborhood spillovers. These patterns are consistent with the interpretation that governance rights may strengthen investors' monitoring incentives and help mitigate agency frictions. This finding has implications for the design of real-world-asset tokens. In the current RealT setting, property tokens do not provide direct voting rights. Our evidence suggests that incorporating governance rights into property-token design may improve investor monitoring incentives, although this interpretation should remain cautious given the potential endogeneity of governance-token ownership.

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Figure 1: Legal and operational structure of RealT's tokenized real estate ownership model.

Properties are legally held by bankruptcy-remote Series LLCs. A law firm establishes the entity and records ownership publicly, while a property management service administers operations and rental income from tenants. Economic ownership is fractionalized through ERC-20 tokens issued on Ethereum, with tokens held in investors' digital wallets representing membership interests in the underlying LLC. This structure separates legal title from tradable economic claims and enables blockchain-based fractional ownership and secondary market liquidity. Source: Request Finance (RealT case study), Request Finance (2026).

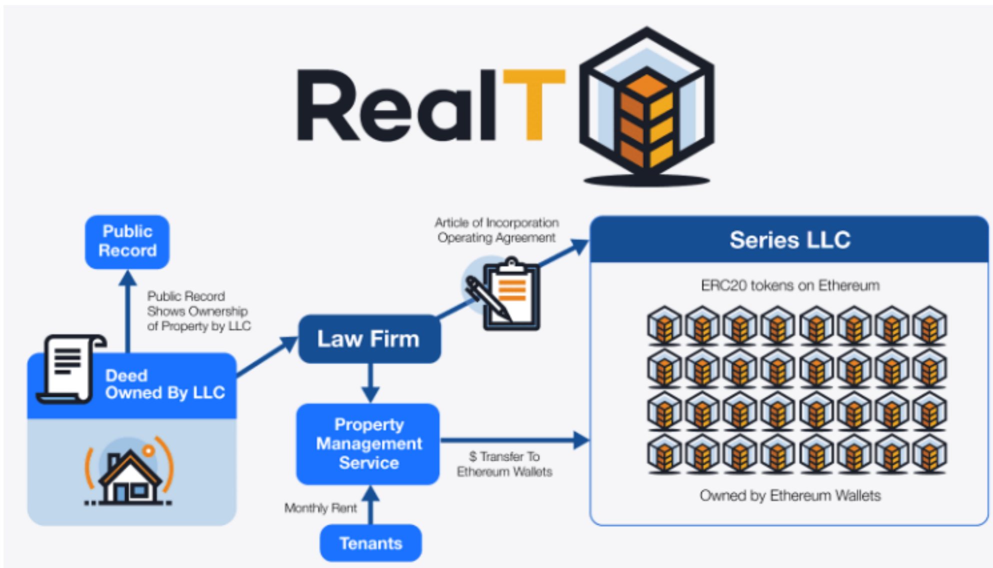


Figure 2: Example of property-level disclosures on the RealT platform.

Example listing showing the financial projections, property characteristics, token supply and pricing, blockchain contract information, and offering details provided to investors for a single tokenized property. The platform reports projected rents and expenses, expected yield, total tokens issued, minimum investment, issuing Series LLC, and settlement infrastructure across Ethereum and Gnosis, illustrating the inputs used in our empirical analysis. Source: Author screenshots from the RealT.co website.

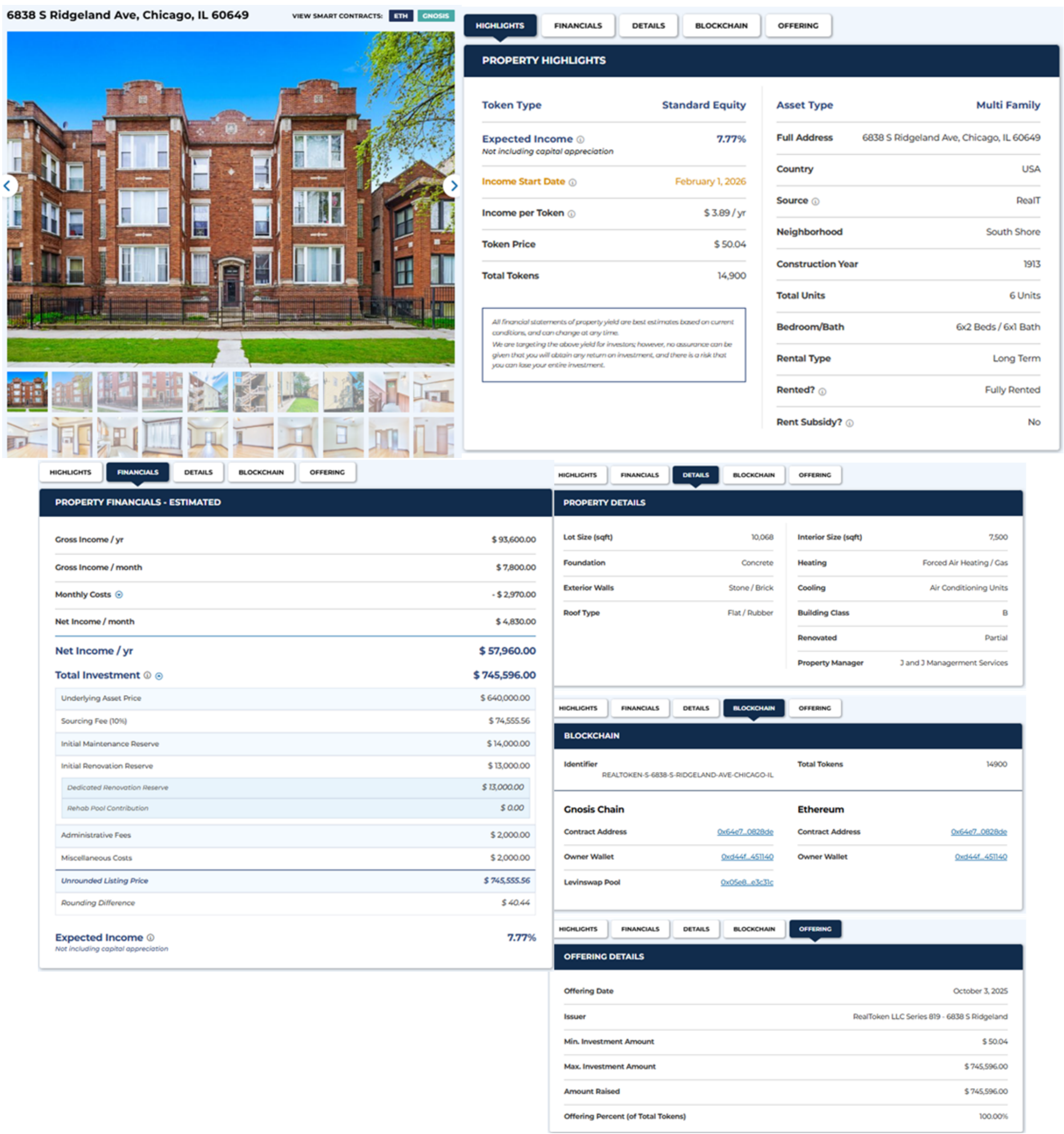


Figure 3: Evolution of Tokenization

This figure plots annual tokenization activity on RealT. The blue bars report the number of tokenization projects launched each year. The red line reports the annual amount of capital raised through security token offerings (STOs) associated with these projects. Source: RealT.

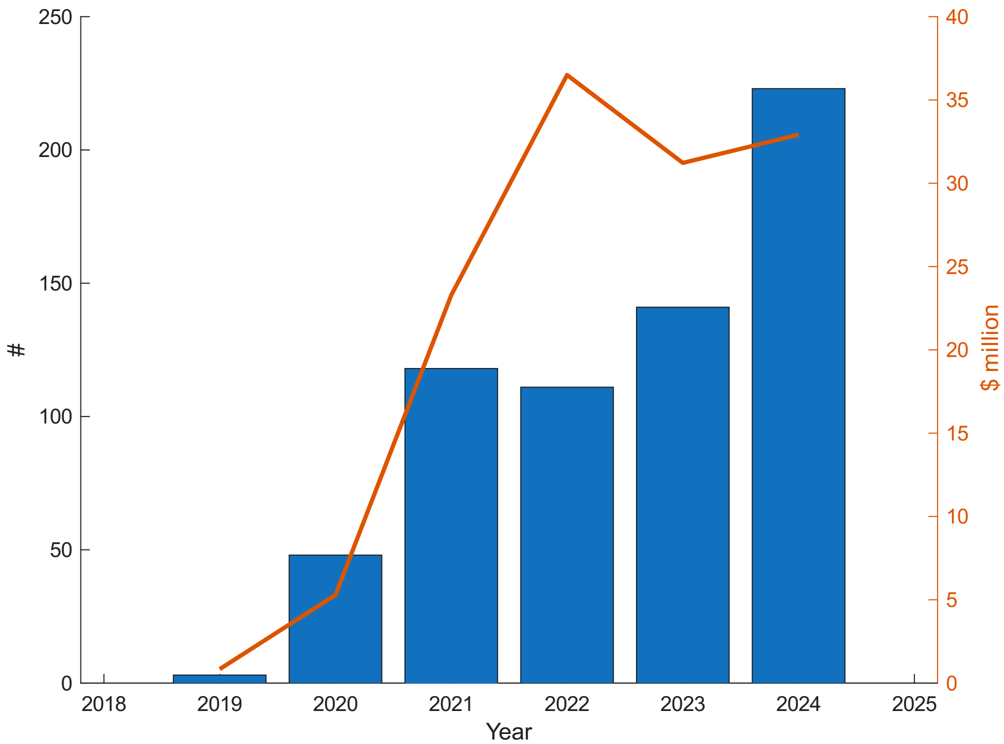
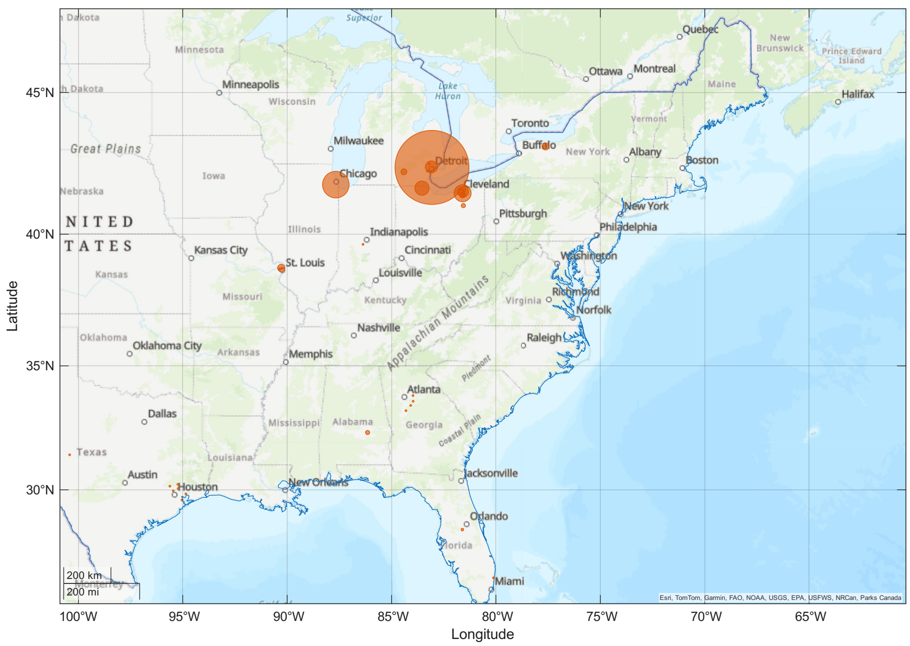


Figure 4: Geographical Distribution of Tokenized Properties

This figure maps the geographic distribution of properties tokenized by RealT. Panel A plots tokenized properties across U.S. cities, with marker size proportional to the total number of tokenized units in each city. Panel B zooms in on Detroit, MI and plots tokenized units alongside the local housing stock. Red markers denote tokenized properties and blue markers denote residential housing units. Source: RealT.

(a) Tokenized units in U.S. cities



(b) Tokenized units in Detroit

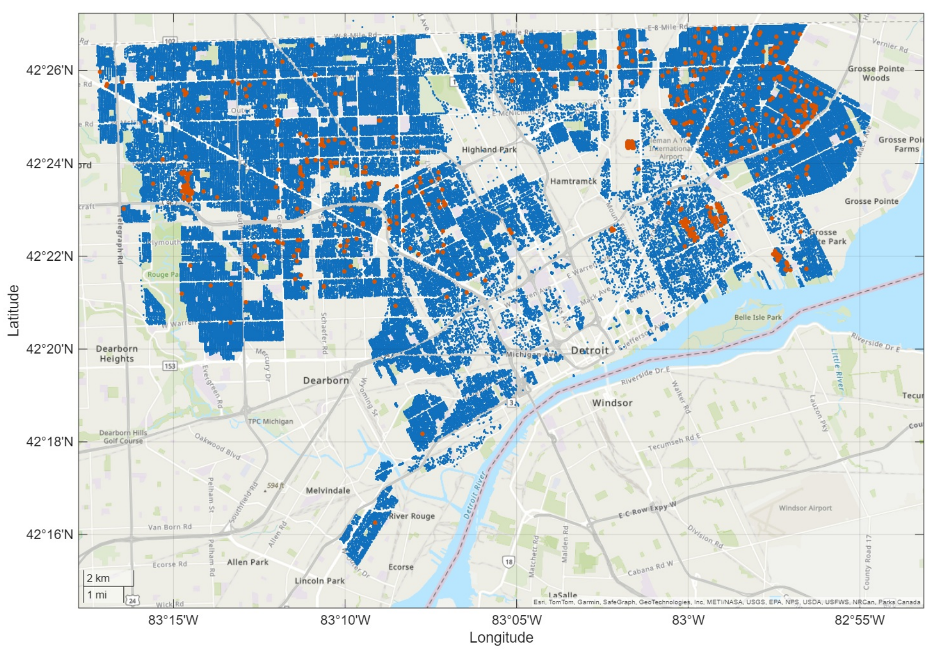


Figure 5: Price Index & Performance of Real Estate Tokens, Case-Shiller, and REITs

Panel (a) compares the cumulative return dynamics of the Detroit Case-Shiller house price index with that of the real estate token price index. Each series is normalized to 1 on April 30, 2019. Panel (b) illustrates a similar comparison between the aggregate U.S. Case-Shiller house price index and the U.S. Single Family Residential REIT index. Panels (c) and (d) report the annualized realized net rental and dividend yields, respectively, for the real estate token index in Panel (c) and the REIT index in Panel (d).

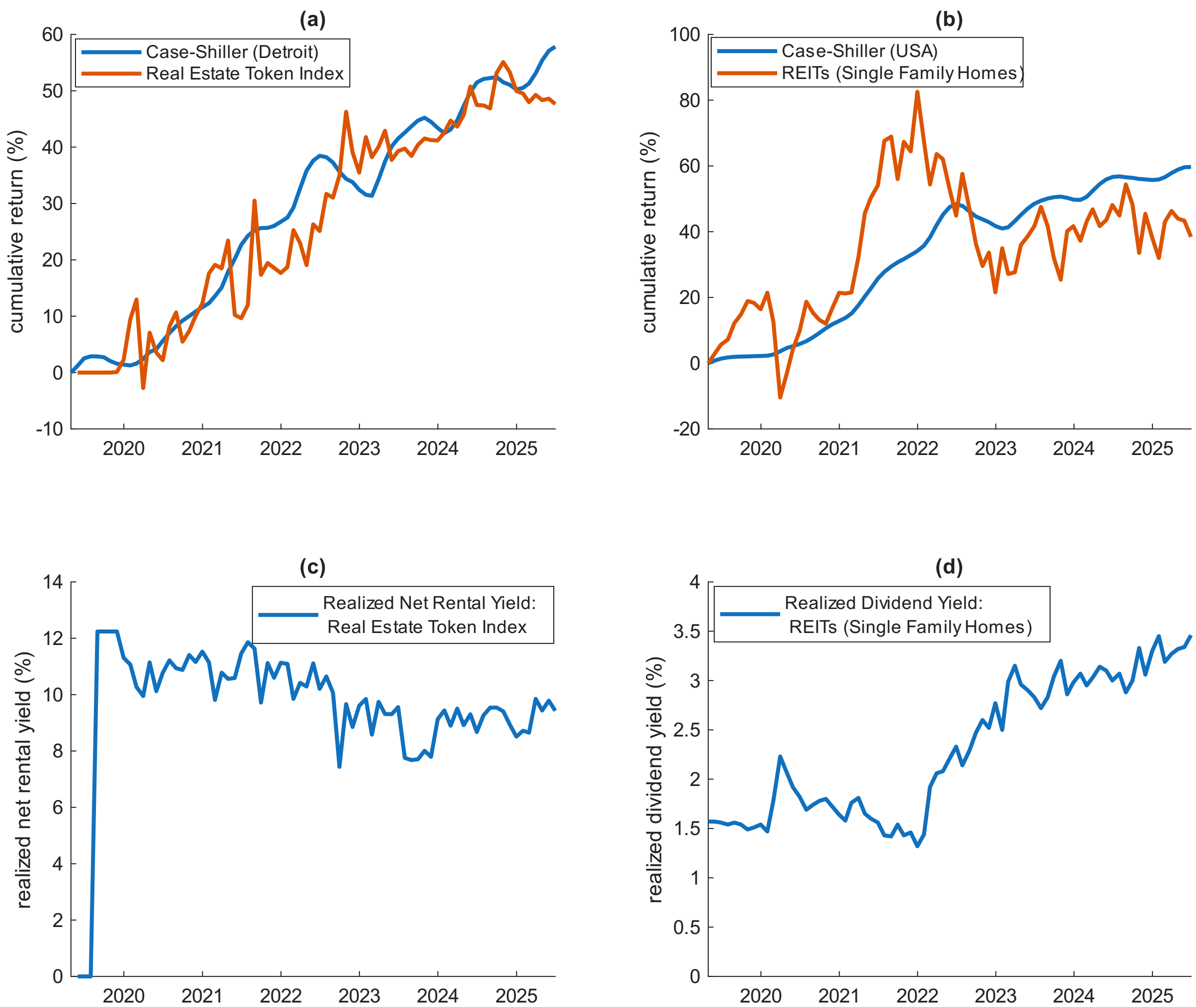


Figure 6: Impact of Tokenization on Housing Turnover

This figure examines the impact of tokenization on turnover. *Annual turnover*, the main outcome variable, is defined as the number of transactions divided by the total number of properties in a given year, expressed in percent. For tokenized properties after tokenization, physical real-estate transactions are no longer observed; therefore, post-event turnover is measured using token trading activity, defined as the total number of tokens traded during the year divided by circulating supply (in percent). The blue line denotes tokenized properties and the red line denotes nearby properties within a 200-meter radius of a tokenized property. Dotted lines indicate 95% confidence intervals.

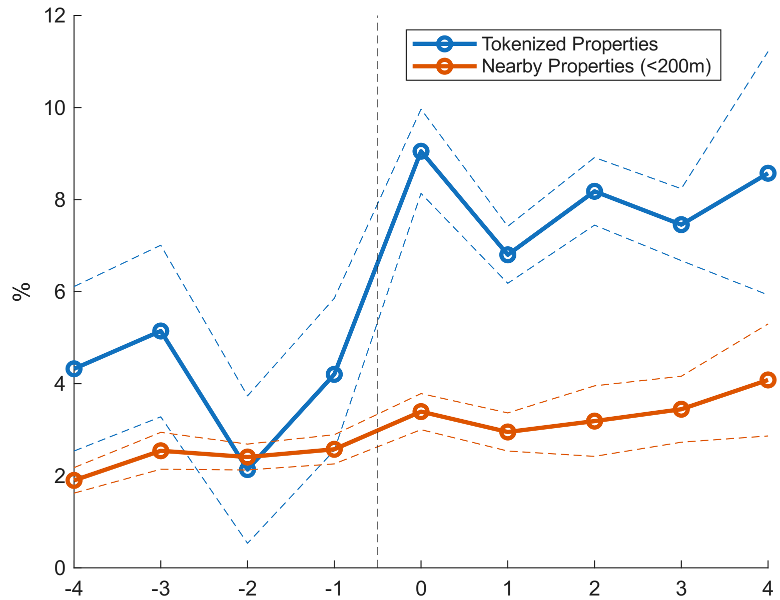
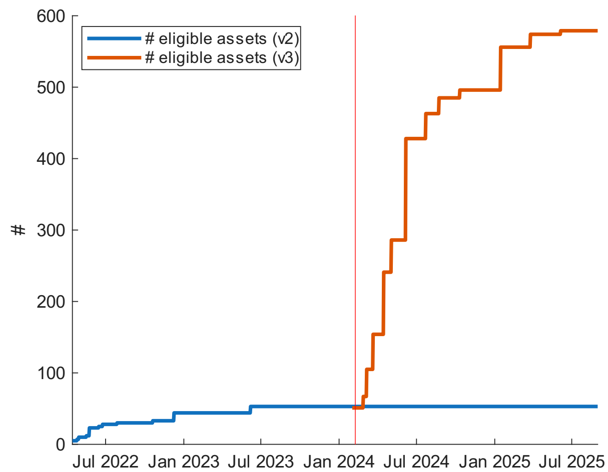


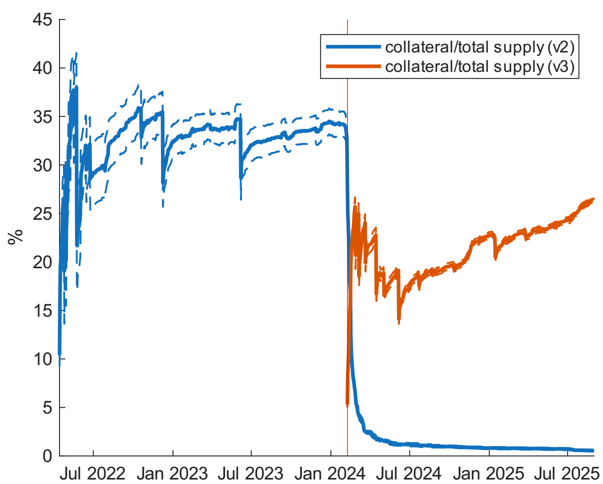
Figure 7: DeFi Collateralization

This figure describes the collateralization of RealT tokens on Real Market Maker (RMM). Panel (a) plots the number of tokens in our sample, the number eligible as collateral in RMM v2 (blue), and the number eligible in RMM v3 (red); the vertical line marks the introduction of RMM v3. Panel (b) plots, for eligible tokens, the ratio of collateral posted to total token supply in v2 (blue) and v3 (red). Dashed lines denote 95% confidence intervals.

(a)



(b)



(c)

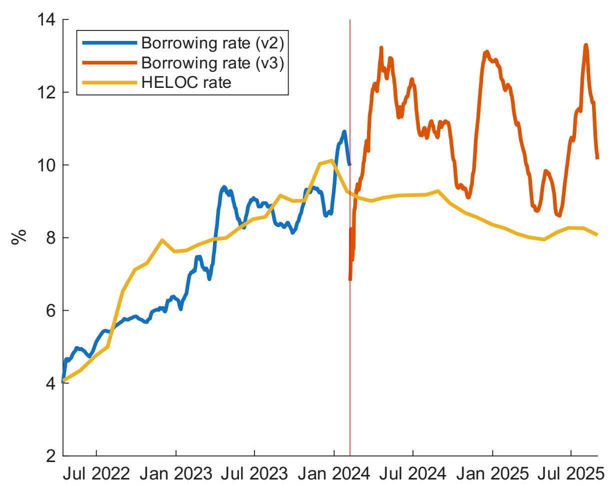


Figure 8: Impact of DeFi Collateralization

This figure plots event-time difference-in-differences estimates and their 90% and 95% confidence intervals. Panel (a) reports dynamic effects on *Turnover*; Panels (b) and (c) report corresponding effects on *Log(Volatility)* and *Log(Amihud)*, respectively. For fixed effects, we include *Event* × *Quarter FE* and *Event* × *Token FE*. Standard errors are clustered at the token level.

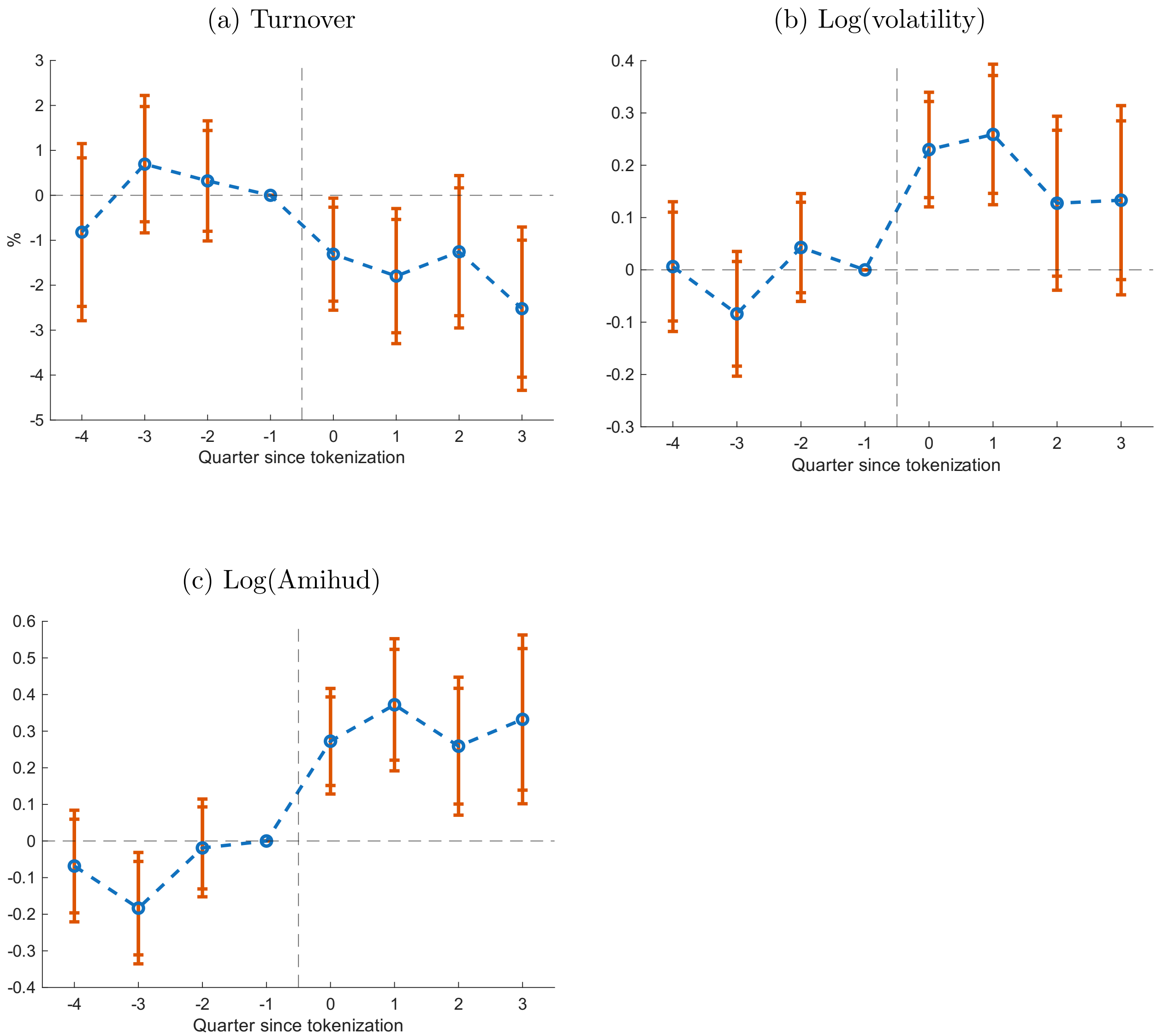
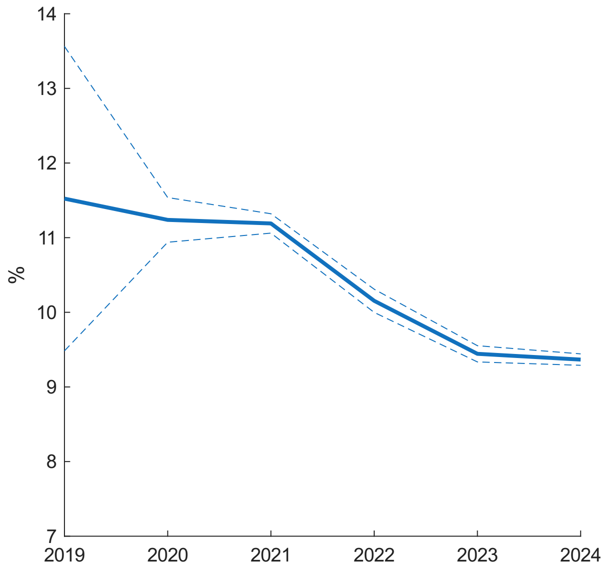


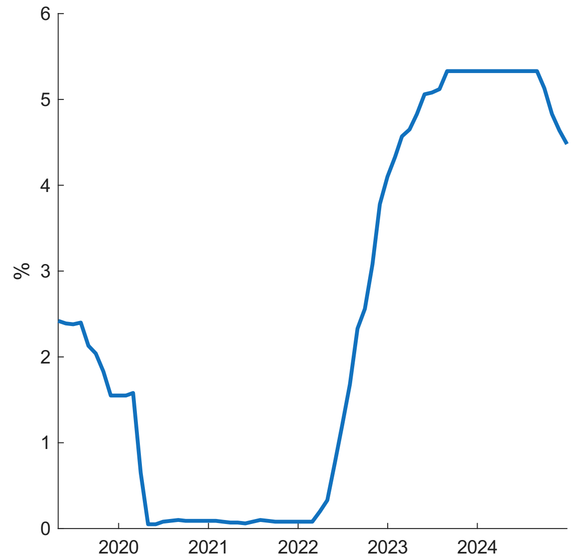
Figure 9: Changing Landscape of Tokenization

This figure presents the changing landscape of tokenization over time. For *Initial yield*, *Reserve*, and *Property age*, we plot the annual mean and 95% confidence interval. *Reserve* is defined as the sum of the initial renovation and maintenance reserves divided by total investment, expressed in percent. For the federal funds rate, we report the end-of-month value.

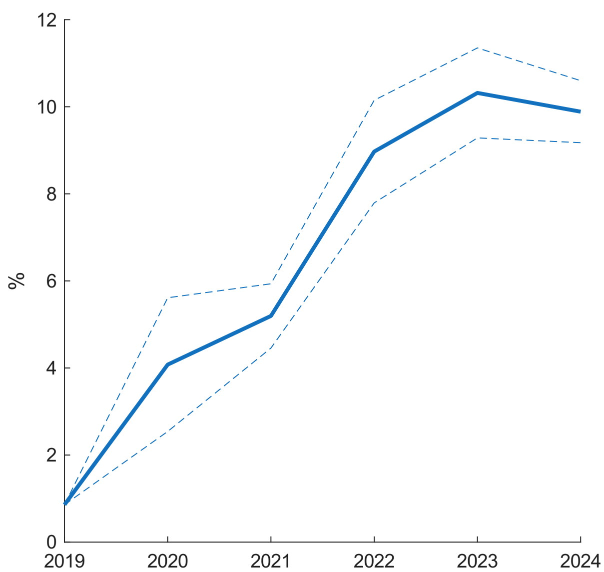
(a) Initial yield



(b) Federal funds rate



(c) Reserve (%)



(d) Property age

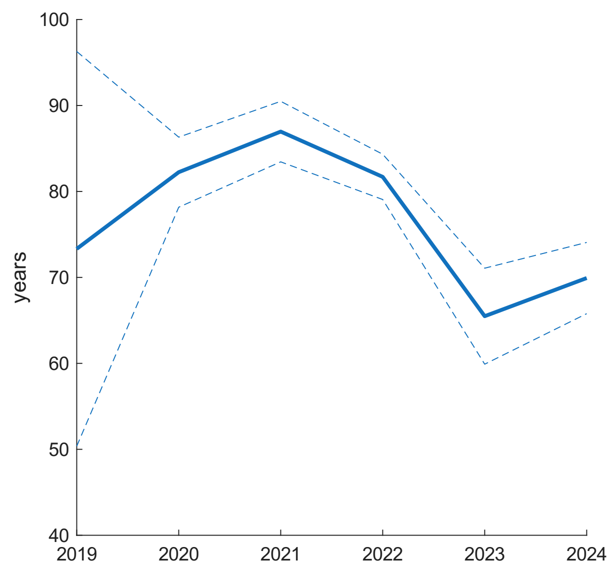


Figure 10: Token Price Dynamics around Detroit City's Lawsuit Against RealT.co

This figure examines token price dynamics around the lawsuit filed by the City of Detroit against RealT on July 2, 2025. Panel (a) plots the average prices of Detroit tokens and non-Detroit tokens, together with the Detroit and U.S. Case–Shiller indexes; all series are normalized to 1 on June 30, 2025. Dotted bands denote 95% confidence intervals for token prices. Panels (b) and (c) focus on Detroit tokens. Panel (b) compares price paths for tokens launched in 2019–2021 versus 2022–2024. Panel (c) compares high- and low-yield tokens issued on Detroit residential real estate, where *high yield* (*low yield*) indicates an initial yield above (below) the sample median.

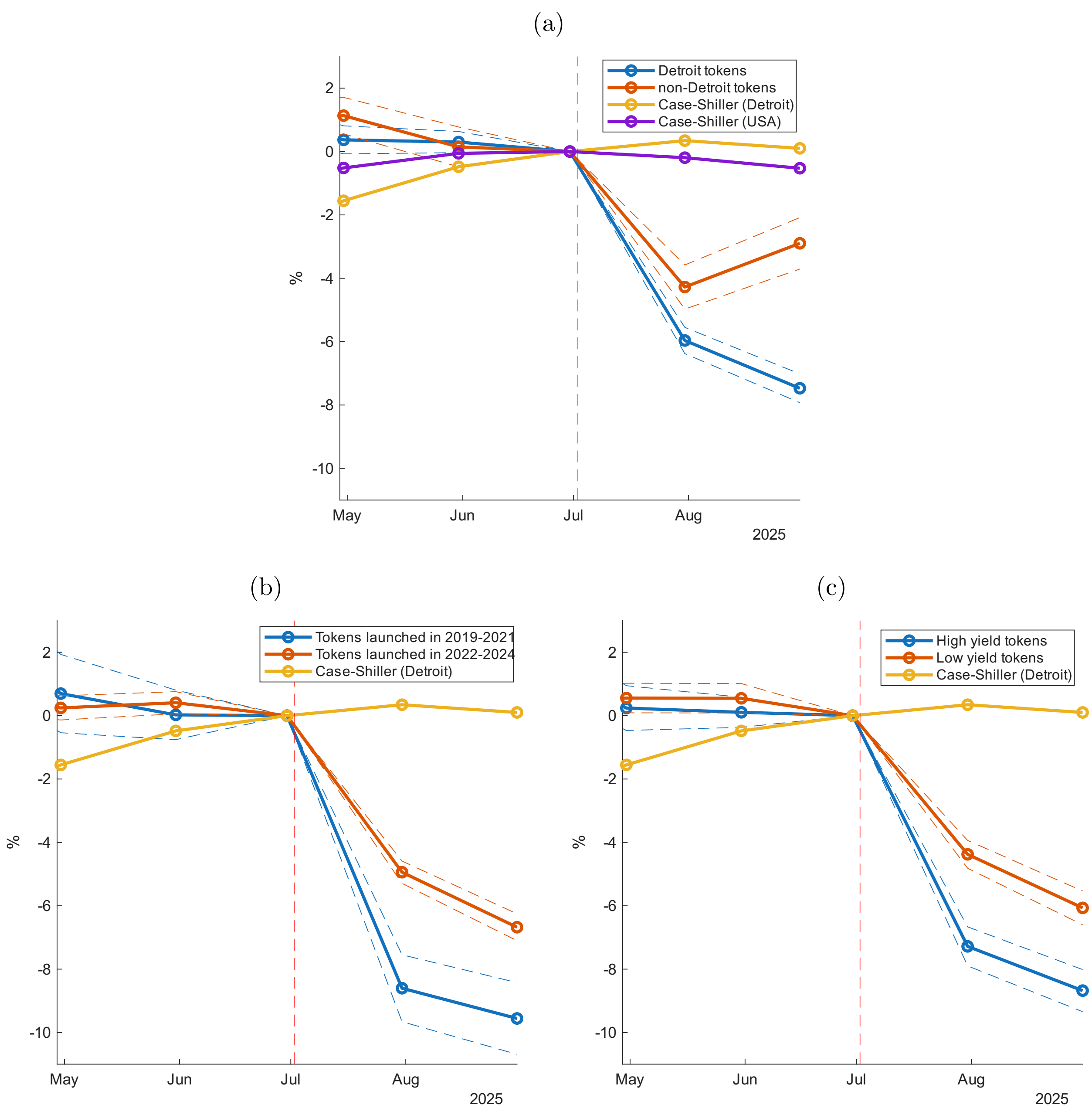


Figure 11: Spillover Effects

This figure reports estimates from an event-study difference-in-differences regression around tokenization:

$$\log(Price_{i,t}) = \alpha + \sum_{k=-4,\, k\neq -1}^{4} \beta_k I_{t-\tau=k} \times Treat_i + \gamma^\top X_{i,t} + \varepsilon_{i,t},$$

where $Price_{i,t}$ is the transaction price of property i in year t; $I_{t-\tau=k}$ is an indicator for event time k relative to property i's tokenization year τ (with $k = -1$ omitted as the reference period); $Treat_i$ equals one for properties located within 200 meters (the inner ring) of a tokenized property and zero for properties located within a distant radius between 200 and 400 meters; and $X_{i,t}$ is a vector of property characteristics (see Section 4.8). The figure plots the estimated β_k coefficients with 90% and 95% confidence intervals. Standard errors are clustered at the tokenized property level.

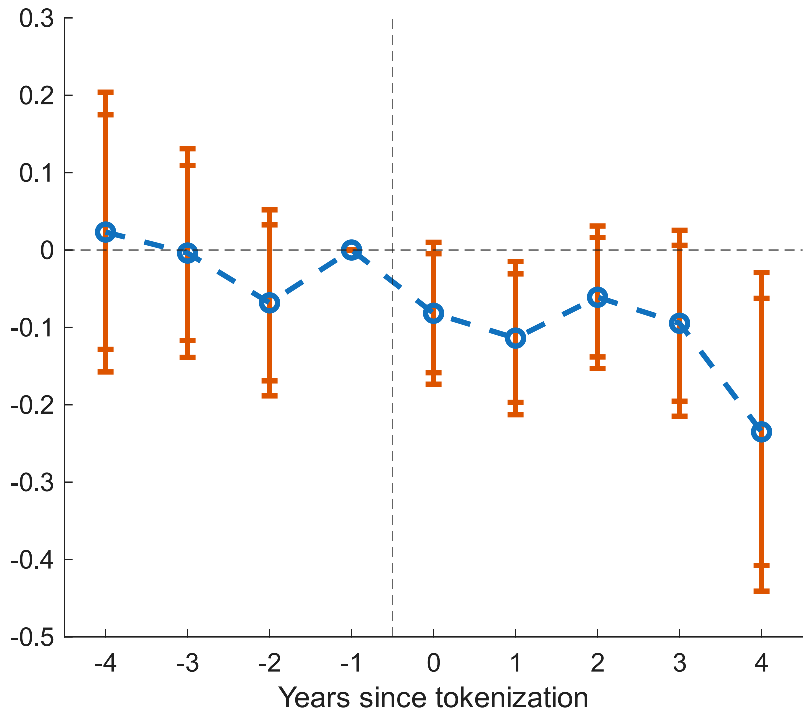


Table 1: Evolution of Tokenization

This table reports the number of tokenization projects and the number of tokenized units, tabulated by launch year (Panel A), property type (Panel B), and project location (Panel C). Source: RealT.

Panel A: Tokenization projects and units by launch Year		
Launch year	**# Tokenization projects**	**# Tokenized units**
2019	3	16
2020	48	94
2021	118	400
2022	111	689
2023	141	505
2024	223	340
Total	644	2044
Panel B: Tokenization projects and units by property type		
Property type	**# Tokenization projects**	**# Tokenized units**
Single Family	438	438
Multi Family	93	1202
Duplex	63	126
SFR Portfolio	33	192
Condominium	7	7
Mixed-Use	5	55
Quadplex	3	12
MFR Portfolio	2	12
Total	644	2044
Panel C: Tokenization projects and units by property location		
Property location	**# Tokenization projects**	**# Tokenized units**
Detroit (MI, USA)	500	1539
Cleveland (OH, USA)	40	82
Chicago (IL, USA)	21	199
St. Louis (MO, USA)	14	15
Toledo (OH, USA)	9	57
Garfield Heights (OH, USA)	8	10
Highland Park (MI, USA)	6	41
Montgomery (AL, USA)	5	5
Boquete (Panama)	3	3
Maple Heights (OH, USA)	3	3
Euclid (OH, USA)	3	3
Punta Chame (Panama)	3	3
East Cleveland (OH, USA)	2	32
Jackson (MI, USA)	2	10
Kissimmee (FL, USA)	2	2
Others	23	40
Total	644	2044

Table 2: Summary Statistics of Tokenization Projects

This table reports summary statistics for tokenization-project characteristics. In Panel A (B), we present project-level (wallet-level) summary statistics. *Total investment* is the dollar amount raised in a tokenization project. *Property acquisition price* is the purchase price of the underlying property(ies). *Circulating supply* is the number of tokens outstanding. *Initial token price* is the offer price at launch. *Initial yield* is the expected net rental yield at launch. *Initial renovation reserve / Total investment* and *Initial maintenance reserve / Total investment* are the fractions of total investment set aside for renovation and maintenance, respectively, expressed in percent. *Listing fee* is the fee paid to RealT as a percentage of total investment. *Property management fee* is the fee paid to a property management company as a percentage of gross rental income. *Platform fee* is the fee paid to RealT as a percentage of gross rental income. *Property size* is the total size of the underlying property(ies) for a project. *Number of units* is the number of rental units in the project. *Unit size* equals *Property size* divided by *Number of units*. *Property age* is measured at launch; for projects backed by multiple properties, we use the average age across properties. *Vacancy rate* is one minus the fraction of months occupied by tenants (expressed in percent). We compute each project's *# of wallets*, *Balance per wallet ($)* from end-of-month token-holder snapshots, valuing holdings using wallet-level realized rent data, and then average each measure over the sample period. At the wallet level, we compute *# of real estate tokens* and *Balance ($)* analogously and average over the sample period. Source: RealT.

Panel A: Project-level summary statistics						
Variables	**N**	**Mean**	**St.dev**	**p25**	**p50**	**p75**
Tokenization deal characteristics						
Total investment ($)	644	198,128.5	258,294.9	66,465.5	81,248.0	157,929.5
Property acquisition price ($)	644	161,856.0	218,010.1	54,000.0	63,000.0	131,500.0
Circulating supply	644	3,782.4	4,984.1	1,300.0	1,600.0	3,000.0
Initial token price ($)	644	50.806	1.693	50.170	50.510	50.930
Initial yield (%)	644	9.992	1.062	9.310	9.820	10.840
$\frac{\text{Initial renovation reserve}}{\text{Total investment}}$ (%)	644	5.855	5.899	1.602	4.377	8.039
$\frac{\text{Initial maintenance reserve}}{\text{Total investment}}$ (%)	644	2.626	0.419	2.517	2.659	2.780
Fee structure						
Listing fee (%)	477	9.971	0.241	10.000	10.000	10.000
Property management fee (%)	644	7.870	0.430	8.000	8.000	8.000
Platform fee (%)	644	2.000	0.000	2.000	2.000	2.000
Property characteristics						
Property size (ft^2)	644	2,953.9	3,846.6	1,092.0	1,362.5	2,353.5
Number of units	644	3.109	4.878	1.000	1.000	2.000
Unit size (ft^2)	644	1,167.2	413.3	887.8	1,139.5	1,348.1
Property age (years)	644	74.450	27.921	68.000	81.000	94.000
Ex-post rental outcomes						
Vacancy rate (%)	644	3.461	13.222	0.000	0.000	0.000
Ownership dispersion						
# of wallets	638	573.625	349.789	350.429	466.542	668.125
Balance per wallet ($)	620	327.295	275.128	177.327	227.414	358.992
Panel B: Wallet-level summary statistics						
# of real estate tokens	22,767	13.544	25.339	1.019	3.698	13.077
Balance ($)	22,767	3,186.064	8,970.164	107.520	432.803	1,923.345

Table 3: Price Discovery and Information Shares: Tokens vs. Case-Shiller

Panel A reports augmented Dickey-Fuller (ADF) tests for the log Detroit token price index (constructed from Detroit single-family property tokens) and the log Detroit Case-Shiller Home Price Index, using both seasonally adjusted and unadjusted series. For each ADF lag order, we report the test statistic, the 5% critical value, and the p-value. Panel B reports estimates from a bivariate vector error-correction model (VECM) for the log token index and the log Case-Shiller index. To align the information set with the Case-Shiller publication delay, we allow the Case-Shiller series to enter with 0-2 additional monthly lags. For each lag assumption, we select the VECM lag length using the Bayesian information criterion (BIC). For the chosen optimal VECM lag, we report Johansen trace statistics (with 5% critical values in parentheses) for the hypotheses of zero and at most one cointegrating relationship, and present price-discovery measures based on Hasbrouck (1995) and Gonzalo and Granger (1995), as described in Section 4.1.

Panel A

Variable	**ADF time series lag**	**Test statistics**	**Critical value (5%)**	**p-value**
Log(Seasonally unadjusted CS index)	0	-1.613	-2.916	0.476
Log(Seasonally unadjusted CS index)	1	-1.699	-2.917	0.432
Log(Seasonally unadjusted CS index)	2	-1.794	-2.918	0.384
Log(Seasonally adjusted CS index)	0	-2.831	-2.916	0.054
Log(Seasonally adjusted CS index)	1	-1.775	-2.917	0.393
Log(Seasonally adjusted CS index)	2	-1.863	-2.918	0.350
Log(Token price index)	0	-1.859	-2.916	0.357
Log(Token price index)	1	-1.556	-2.917	0.481
Log(Token price index)	2	-1.147	-2.918	0.672

Panel B

CS lag	**Optimal VECM lag**	**Trace statistics (critical value 5%) # of cointegrating vectors** None	**At most 1**	λ_1	λ_2	**HAS1**	**HAS2**	**GG**
Using seasonally unadjusted CS index								
0	2	31.10 (15.41)	3.30 (3.76)	-0.048	0.448	0.556	0.705	0.903
1	2	26.26 (15.41)	2.79 (3.76)	-0.045	0.506	0.769	0.730	0.918
2	2	26.65 (15.41)	2.37 (3.76)	-0.031	0.568	0.837	0.895	0.948
Using seasonally adjusted CS index								
0	2	21.19 (15.41)	3.61 (3.76)	-0.009	0.466	0.945	0.969	0.981
1	2	20.46 (15.41)	3.34 (3.76)	-0.007	0.489	0.994	0.982	0.986
2	2	22.23 (15.41)	3.29 (3.76)	-0.002	0.535	0.995	0.999	0.997

Table 4: Performance of Real Estate Tokens and REITs

At the end of each month t, we compute (i) capital gain, $P_t/P_{t-1} - 1$, (ii) realized net rental (dividend) yield, D_t/P_{t-1}, and (iii) total return, $(P_t + D_t)/P_{t-1}$, where P_t denotes the end-of-month price and D_t denotes per-share net rental (dividend) income earned during month t. Panel A reports tokenization project-level summary statistics for these measures. Because tokens launch at different dates, we align investment horizons by computing each token's returns from its launch month through June 2025 and evaluating REIT performance over the same calendar-month window. We then compare average monthly outcomes for three token samples: *All* (all tokenization projects), *Detroit* (all Detroit projects), and *Detroit (SFR)* (Detroit projects backed by single-family homes). For each sample, we report the performance of the corresponding REIT benchmark(s). Panel B reports market-capitalization-weighted price indexes for *All*, *Detroit*, and *Detroit (SFR)* and compares them with the REIT benchmark over April 2019–June 2025.

Panel A: Tokenization-level analysis

		Capital Gain (%)					**Realized Net Rental (Dividend) Yield (%)**					**Total Return (%)**				
	N	Mean	St.dev.	p25	p50	p75	Mean	St.dev.	p25	p50	p75	Mean	St.dev.	p25	p50	p75
All	625	0.232	0.224	0.085	0.213	0.360	0.723	0.124	0.677	0.757	0.802	0.956	0.292	0.763	0.965	1.155
SFR REITS	625	-0.146	0.338	-0.394	-0.167	0.070	0.251	0.022	0.231	0.260	0.265	0.105	0.332	-0.132	0.099	0.317
Detroit	483	0.253	0.221	0.108	0.250	0.382	0.740	0.110	0.702	0.768	0.809	0.993	0.269	0.803	1.010	1.180
SFR REITS	483	-0.116	0.315	-0.282	-0.108	0.089	0.249	0.022	0.229	0.258	0.265	0.133	0.308	-0.039	0.134	0.340
Detroit (SFR)	424	0.245	0.222	0.099	0.247	0.373	0.736	0.106	0.699	0.765	0.805	0.981	0.266	0.784	0.993	1.171
SFR REITS	424	-0.121	0.315	-0.282	-0.108	0.089	0.250	0.022	0.227	0.260	0.265	0.130	0.307	-0.039	0.134	0.328

Panel B: Index-level analysis

		Capital Gain (%)					**Realized Net Rental (Dividend) Yield (%)**					**Total Return (%)**					**Sharpe Ratio**
	N	Mean	St.dev.	p25	p50	p75	Mean	St.dev.	p25	p50	p75	Mean	St.dev.	p25	p50	p75	
All	74	0.412	2.988	-0.656	0.131	1.885	0.740	0.177	0.683	0.755	0.830	1.152	3.013	0.000	0.957	2.773	0.382
Detroit	74	0.495	3.447	-0.992	0.140	2.023	0.768	0.181	0.731	0.795	0.853	1.263	3.475	-0.259	0.996	2.972	0.363
Detroit (SFR)	74	0.615	4.193	-0.762	0.057	2.148	0.800	0.193	0.761	0.819	0.923	1.415	4.223	0.000	1.020	3.090	0.335
SFR REITS	74	0.626	6.080	-3.924	1.218	4.325	0.193	0.057	0.138	0.183	0.251	0.819	6.080	-3.698	1.475	4.500	0.100

Table 5: Impact of Tokenization on Turnover

This table examines the impact of tokenization on turnover. *Pre-* and *Post-Annual turnover* are defined as the number of transactions divided by the total number of properties in a given year, expressed in percent, for periods before and after the tokenization event, respectively. Because tokenized properties are not transacted as physical real estate after tokenization, post-event turnover for tokenized properties is measured using token trading activity: annual token turnover is the total number of tokens traded during the year divided by circulating supply, expressed in percent. Panel A reports summary statistics for tokenized properties and nearby (control) properties located within 200 meters. Panel B reports difference-in-differences estimates in which *Treat* equals one for tokenized properties (and zero for nearby controls) and *Post* equals one for observations after the token launch date (and zero otherwise). Standard errors are clustered at the tokenized project level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Summary statistics

Variables	N	Mean	St.dev.	p25	p50	p75
Tokenized properties						
Pre-annual turnover (%)	2,436	3.582	18.488	0.000	0.000	0.000
Post-annual turnover (%)	1,248	8.061	7.517	3.802	6.388	10.007
Nearby properties ($\leq$ 200 meters)						
Pre-annual turnover (%)	2,436	2.356	4.072	0.000	1.190	3.306
Post-annual turnover (%)	1,248	3.252	4.610	0.509	2.180	4.497

Panel B: Impact of tokenization on turnover

	(1) Annual turnover (%)
Treat x Post	3.582***
	(0.460)
N	7,368
Adjusted R2	0.098
Event x Years since tokenization FE	Yes

Table 6: Token Turnover, Volatility, and Price Impact

Panel A reports summary statistics for *Turnover (%)*, *Volatility (%)*, and *Amihud*. *Turnover (%)* is the annualized turnover rate, expressed in percent, and measured at the monthly frequency. *Volatility (%)* is the average absolute daily return within the month, expressed in percent. *Amihud* is the monthly average of the daily ratio of absolute log return to trading volume. Panel B examines cross-sectional determinants of turnover, volatility, and price impact. *Lagged log(market cap)* is the lagged market capitalization of the token. *Property age* is measured relative to the token's launch date. *Years since appraisal* is the number of years since the most recent disclosed appraisal. *Initial yield* is the expected rental yield at launch. *Reserve (%)* is the sum of initial maintenance and renovation reserves divided by total investment, expressed in percent. *Lagged HHI* is the prior-month Herfindahl index of token holdings across wallets. Standard errors are clustered at the token level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Summary statistics

Variables	N	Mean	SD	p25	p50	p75
Turnover (%)	17,246	7.902	12.999	1.232	3.512	8.825
Volatility (%)	11,058	4.814	3.997	2.181	3.810	6.086
Amihud	11,058	1.298	1.613	0.304	0.779	1.752

Panel B: Determinants of turnover, volatility, and price impact

	(1) Turnover (%)	(2) Log(Volatility)	(3) Log(Amihud)
Lagged log(market cap)	0.511***	0.015	-0.173***
	(0.196)	(0.016)	(0.026)
Property age (years)	-0.006	0.000	0.001*
	(0.006)	(0.001)	(0.001)
Years since appraisal	-0.514***	0.158***	0.152***
	(0.194)	(0.020)	(0.028)
Initial yield (%)	0.767***	0.142***	0.177***
	(0.172)	(0.018)	(0.025)
Reserve (%)	0.032	0.005*	0.005
	(0.027)	(0.003)	(0.004)
Lagged HHI	-8.982	1.032**	5.200***
	(5.994)	(0.449)	(0.820)
N	17,242	10,748	10,748
Adjusted R2	.0929	.226	.347
Year-month FE	Yes	Yes	Yes

Table 7: Impact of DeFi Collateral Eligibility

This table reports difference-in-differences estimates of the effects of DeFi collateral eligibility on market quality and token prices. The analysis uses a stacked difference-in-differences design with a sample window of ±4 quarters around each event. It examines trading activity, volatility, and price impact. *Turnover (%)* is the annualized turnover rate, expressed in percent, and measured at the quarterly frequency. *Log(volatility)* and *Log(Amihud)* are defined analogously to those in Table 6, but are measured at the quarterly frequency. Standard errors are clustered at the token level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Turnover (%)		Log(volatility)		Log(Amihud)	
Treatment x Post	-1.720***	-1.811***	0.208***	0.241***	0.353***	0.366***
	(0.590)	(0.583)	(0.055)	(0.057)	(0.066)	(0.071)
N	25,683	25,600	17,041	16,951	17,041	16,951
Adjusted R2	0.186	0.183	0.457	0.538	0.603	0.603
Event x Token FE	Yes	Yes	Yes	Yes	Yes	Yes
Event x Quarter FE	Yes	No	Yes	No	Yes	No
Event x Region x Quarter FE	No	Yes	No	Yes	No	Yes

Table 8: Determinants of Initial Yield

This table examines cross-sectional determinants of *Initial yield*, defined as the expected rental yield at token launch. *Federal funds rate* is the end-of-month federal funds rate most recently observed prior to the launch date. *Reserve (%)* is the sum of initial maintenance and renovation reserves divided by total investment, expressed in percent. *Property age* is measured at launch. *Log(unit size)* is the logarithm of total property size divided by the number of units. *Detroit* (*Cleveland*) is an indicator equal to one if the underlying properties are located in Detroit, MI (Cleveland, OH), and zero otherwise. Heteroskedasticity-robust standard errors are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Initial Yield (%)				
Federal funds rate (%)		-0.344***					-0.291***
		(0.014)					(0.022)
Reserve (%)			-0.057***				-0.025**
			(0.848)				(1.076)
Property age (years)				0.010***			0.008***
				(0.002)			(0.001)
Log (unit size)					-0.641***		-0.151
					(0.164)		(0.092)
Detroit						0.902***	0.756***
						(0.139)	(0.126)
Cleveland						0.355*	0.609***
						(0.184)	(0.158)
N	643	643	643	643	643	643	643
Adjusted R2	.035	.489	.132	.0876	.0649	.126	.581
Property Type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 9: Effect of the Detroit Lawsuit on Token Prices

This table examines the effect of the lawsuit filed by the City of Detroit against RealT.co on July 2, 2025 on real estate token prices. Columns (1)–(4) (columns (5)–(8)) use as the dependent variable the log price change from June 30, 2025 to July 31, 2025 (to August 31, 2025), defined as $\log(P_t/P_{\text{Jun 30, 2025}})$. *Detroit* is an indicator equal to one if the underlying properties are located in Detroit, MI, and zero otherwise. *Launched in 2019–2021* is an indicator equal to one if the tokenization project launched between 2019 and 2021, and zero otherwise. *Initial yield* is the expected rental yield at launch. *Frac. of REG holders* is the fraction of investors who held more than 10 REG tokens as of June 30, 2025. Heteroskedasticity-robust standard errors are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		$Log\left(\frac{P_{July\ 2025}}{P_{June\ 2025}}\right)$				$Log\left(\frac{P_{August\ 2025}}{P_{June\ 2025}}\right)$		
Detroit	-1.687***				-4.572***			
	(0.413)				(0.474)			
Launched in 2019-2021		-3.665***				-2.879***		
		(0.567)				(0.614)		
Initial yield (%)			-1.525***				-1.304***	
			(0.291)				(0.286)	
Fraction of REG holders				18.244***				16.758***
				(3.322)				(4.656)
N	625	483	480	478	625	483	480	478
Adjusted R2	.022	.124	.105	.0628	.125	.0627	.0638	.0431
Sample	All	Detroit	Detroit	Detroit	All	Detroit	Detroit	Detroit

Table 10: The Detroit Lawsuit and Property Code Violations

This table examines the determinants of property-level code violations issued by the City of Detroit against RealT.co on July 2, 2025. *Any Violation (Violation affecting nearby properties)* is defined as an indicator equal to one if the underlying property incurs a Priority 1–3 violation and zero otherwise. *Launched in 2019–2021* is an indicator equal to one if the tokenization project launched between 2019 and 2021, and zero otherwise. *Initial yield* is the expected rental yield at launch. *Frac. of REG holders* is the fraction of investors who held more than 10 REG tokens as of June 30, 2025. This regression includes control variables used in equation (1). Heteroskedasticity-robust standard errors are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A **Violation category**	**# Properties**
Priority 1 violation	46
Priority 2 violation	222
Priority 3 violation	107
No violation	257
Total	632

Panel B	(1)	(2)	(3)	(4)	(5)	(6)
	Any Violation			Violation affecting nearby properties		
Launched in 2019-2021	0.234***			0.152***		
	(0.035)			(0.051)		
Initial yield (%)		0.125***			0.079***	
		(0.018)			(0.024)	
Fraction of REG holders			-1.218***			-1.248***
			(0.340)			(0.276)
N	631	631	629	631	631	629
Adjusted R2	.360	.368	.280	.288	.291	.382
Property Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Include Control Variables	Yes	Yes	Yes	Yes	Yes	Yes

Table 11: Spillover Effects from Tokenization in Detroit

This table examines the spillover effects of tokenization in Detroit using the difference-in-differences specification:

$$\log(Price_{i,t}) = \alpha + \beta\,(Treat_i \times Post_t) + \gamma^\top X_{i,t} + \varepsilon_{i,t},$$

where $Price_{i,t}$ is the transaction price of property i in year t. $Treat_i$ equals one for properties located within 200 meters (inner ring) of a tokenized (or LTR) property and zero for properties located between 200 and 400 meters (outer ring). $X_{i,t}$ is a vector of property characteristics (see Section 4.8). Standard errors are clustered at the tokenized property level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log(Price)									
	Tokenization							LTR Acquisition		
Treat x Post	-0.078**	-0.163***	-0.012	-0.009	-0.121***	-0.189***	0.015	0.031	0.052*	-0.017
	(0.032)	(0.058)	(0.031)	(0.043)	(0.043)	(0.041)	(0.042)	(0.023)	(0.027)	(0.039)
N	20,459	10,061	10,398	7,111	13,348	10,842	9,394	21010	14725	6245
Adjusted R2	.28	.236	.327	.356	.242	.254	.306	0.341	0.322	0.366
Event x Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event x Treat FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	Launched in 2019-2021	Launched in 2022-2023	Initial yield <med.	Initial yield ≥med.	Frac. REG holders<med.	Frac. REG holders≥med.	All	Launched in 2019-2021	Launched in 2022-2023

INTERNET APPENDIX

From Bricks to Blocks: Tokenization and the Financialization of Real Estate

Abstract

Tokenization converts real estate into tradable blockchain tokens and promises broader access, continuous trading, and improved liquidity for an otherwise illiquid asset class. We test these claims using a property-level panel of 644 U.S. residential properties, linking on-chain prices, rents, and trades to traditional housing records. Despite frequent trading, token prices add little information and follow, rather than lead, housing fundamentals. Liquidity improves only modestly, and higher returns reflect elevated rental yields and platform design rather than superior performance. Secondary markets exhibit poor market quality, and DeFi collateralization appears to aggravate these frictions. Dispersed ownership also weakens monitoring, introduces intermediary risk, and generates negative neighborhood spillovers. Overall, tokenization changes the packaging and accessibility of real estate claims more than their underlying economics: market design and governance, not blockchain technology alone, can determine information, liquidity, and real outcomes.

JEL Classification Codes: G12, G13, G14, O33, Y80

Keywords: blockchain, housing, real estate, tokenization

A Data construction

A.1 Secondary market trading data

RealTokens are traded in two types of secondary-market venues: peer-to-peer (P2P) token exchange platforms and decentralized exchanges (DEXs). We identify two major P2P platforms, Swapcat and YAM Finance, and two DEXs, LevinSwap and Uniswap. Below, we describe how we construct secondary-market trading data for each type of venue.

For Swapcat and YAM Finance, which have similar smart contract structures, we identify USDC and xDAI as the primary numeraires and therefore restrict the sample to transactions denominated in these two assets. Our main price measure is the volume-weighted average price (VWAP) for token i at the daily or monthly frequency. Suppose that, during period t (day or month), token i has $N_{i,t}$ transactions. For transaction k, we define the transaction price as

$$P_{i,k,t} = \frac{D_{i,k,t}}{Shares_{i,k,t}}, \tag{A.1}$$

where $D_{i,k,t}$ denotes the dollar value of the numeraire transferred and $Shares_{i,k,t}$ denotes the number of tokens transferred. We then compute VWAP as

$$VWAP_{i,t} = \frac{\sum_{k=1}^{N_{i,t}} P_{i,k,t} \times Shares_{i,k,t}}{\sum_{k=1}^{N_{i,t}} Shares_{i,k,t}} = \frac{\sum_{k=1}^{N_{i,t}} D_{i,k,t}}{\sum_{k=1}^{N_{i,t}} Shares_{i,k,t}}. \tag{A.2}$$

For LevinSwap, we begin by identifying all transactions executed through the LevinSwap router. To focus on transactions corresponding to secondary-market trades rather than liquidity provision or withdrawal, we retain only transactions that execute functions containing the keyword "swap." We then collect the addresses of all liquidity provider (LP) tokens issued by LevinSwap and retain only those associated with RealTokens. Next, we gather all token transfers linked to these LP token addresses, including transfers generated by purchases and sales of RealTokens on LevinSwap. To isolate secondary-market trades, we impose two additional filters. First, we retain only transactions with exactly two transfers, such as a transfer of USDC in exchange for a RealToken. Second, we restrict attention to transactions executed through swap functions. This procedure ensures that, for each LP-token-address-by-transaction pair, there are exactly two transfers: one involving the RealToken and the other involving the numeraire.

For Uniswap, we use Bitquery, which provides cleaned DEX trade data with explicitly identified buy and sell tokens. This makes the construction of transaction-level prices straightforward. We then apply the same procedure described above to compute daily and monthly VWAPs for each token traded on LevinSwap and Uniswap.

To convert numeraires into dollar values, we generally use daily prices from CoinGecko, except for the Levin token, which is not covered by CoinGecko. For the Levin token, we instead compute its VWAP using the Levin-USDC pair on LevinSwap.

To reduce the influence of economically negligible trades, we impose several transaction-level filters. First, we require the transfer value of each transaction to exceed \$0.1. Second, we retain only transactions with prices between \$25 and \$1,000. The lower bound is approximately 50% of the initial value of most tokens in our sample, while the upper bound limits the influence of extreme outliers, which can be particularly problematic in thin markets.

After constructing venue-level measures, we define aggregate VWAP for each token by taking the volume-weighted average of venue-level VWAPs, where the weight for each venue is its share of total trading volume. We define total trading volume as the sum of trading volumes across all venues.

Table A.1: Real Estate Tokenization Platforms

This table summarizes the real estate tokenization platforms we hand-collected to gauge the size of the tokenized real estate market. For each platform, we report the platform's location, the blockchain(s) used to issue real estate tokens, the number of tokenized properties, an estimate of market size, the predominant property type, whether more than 80% of properties are located in the United States, and whether tokenized properties are selected by the platform or by property owners. Source: RWA.xyz [https://app.rwa.xyz/real-estate] and independent search.

Platform	Platform location	Blockchain	# properties (or projects)	Market size	Proprety detail	Primarily U.S. properties?	Entity choosing properties
RealT	United States	Ethereum; Gnosis Chain	>700 properties with >2200 units	$144M raised (Dec. 2025). Data source: Our main data	Primarily U.S. residential	Yes	Tokenization platform
Lofty	United States	Algorand	128 properties	Fair Value: $46M (Jan. 2026). Data source	U.S. residential	Yes	Property owners
Landshare	United States	BNB Smart Chain	4 properties	Value: $0.6M (as of Jan 2026) Data source	U.S. residential	Yes	Tokenization platform
Groma	United States	Base	114 properties	$58.2M Data source	US multifamily REIT	Yes	Tokenization platform
AspenCoin	United States	Ethereum (initial issuance)	1 project (St. Regis Aspen Resort)	$18M raised (2018; noted in 2019 press release) Data source	Hotel / resort in Aspen, Colorado, USA.	Yes	Tokenization platform
RedSwan Digital Real Estate	United States	Stellar	Not disclosed	$108M Data source	Commercial real estate (institutional-grade CRE)	N.A.	Tokenization platform
Zoniqx	United States	Multi-chain (Polygon; XRP Ledger; Hedera)	Not disclosed	Tokenized $100M real estate fund (case study); $1B real estate fund on XRPL (Aug 2025) Data source	Real estate funds (PPP, mixed-use) and institutional tokenization	Yes	Tokenization platform
DigiShare	United States	Ethereum	1 property	$20M Data source	U.S. vacant land assets	Yes	Tokenization platform
Binaryx	United States	Polygon	13 properties	$2.6M Data source	Vacation / resort properties (e.g., Bali) & global properties	No	Tokenization platform
Patel Real Estate Holdings (PREH)	United States	Chintai	1 property	$100M Data source	Institutional fund	No	Tokenization platform
CitaDAO	Singapore	Ethereum	3 industrial units	$5.5M Data source	Industrial units (Singapore); also commercial properties (global)	No	Tokenization platform

Continued on next page

Table A.1 – *Continued from previous page*

Platform	Platform location	Blockchain	# properties (or projects)	Market size	Proprety detail	Primarily U.S. properties?	Entity choosing properties
Kin Capital	Singapore	Chintai	1 property	$100M Data source	Real estate debt fund	No	Tokenization platform
RealNOI	Singapore	Chintai	1900 properties	$570M Data source	Apartments	No	Tokenization platform
Fraxtor	Singapore	Not disclosed	25 projects (Feb 2025)	S$2B($\approx$ \$160M) gross development value tokenized (past ∼5 years; reported Feb 2025) Data source	Global real estate projects (incl. Singapore industrial project example)	No	Tokenization platform
Brickken	Spain	Ethereum; BNB Smart Chain; Base; Polygon	Not disclosed	>$250M assets tokenized since Mar 2023 (reported Jan 2025) Data source	RWA tokenization incl. real estate, equity, debt	No	Tokenization platform
Reental	Spain	Polygon	>100 properties	$47.6M Data source	residential rental properties (apartment/condo-style units)	No	Tokenization platform
Blocksquare	Slovenia	Ethereum; IPFS	66 properties	$200M Data source	Mixed: hotels, restaurants, apartments, parking, healthcare, etc.	No	Tokenization platform
StegX	Germany	Hedera	Not disclosed	>$100M (May 2025) Data source	Institutional real estate	No	Tokenization platform
Ctrl Alt	United Arab Emirates	XRP Ledger/MANTRA	19 properties	$124 M Data source	commercial real estate portfolios, government-owned land & buildings, affordable housing developments, hospitality/tourism assets, and special economic zones.	No	Tokenization platform
MetaWealth	Ireland	Solana	Not disclosed	$10.9M Data source	Tokenized real-estate bonds (rental, construction, private credit exposures)	No	Tokenization platform
T-RIZE Group	Canada	Not disclosed	1 major project with 960 units (Project Champfleury)	$23M Data source	Residential new development (Canada)	No	Tokenization platform
RealtyX	British Virgin Islands	Base	1 property	$0.3M Data source	A luxury apartment in Dubai	No	Tokenization platform