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Research Article

Stranded Assets and the Financialization of Real Estate: Conceptualizing the Systemic Risk of Climate Inaction

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Abstract

The global real estate sector faces unprecedented exposure to climate-related stranded asset risks, yet the mechanisms through which environmental policy transitions translate into systemic financial instability remain inadequately theorized. Existing research has documented the potential magnitude of asset stranding in real estate, with estimates suggesting $16 trillion in residential and $5 trillion in commercial assets at risk, but limited attention has been given to how these risks propagate through financialized global capital markets. This conceptual paper addresses this gap by developing a comprehensive framework for understanding climate-related stranded assets in real estate as a source of systemic financial risk. The study employs a conceptual research methodology based on systematic review and theoretical synthesis, integrating path dependence theory, financialization research, and socio-technical system studies. The analysis reveals that traditional real estate valuation methodologies are locked into regressive practices that systematically ignore climate risks, while energy performance regulations have the potential to hardwire valuation risk into global capital markets. The financialization of real estate over recent decades has created deep integration between property markets and global financial systems, meaning that climate-related devaluation could trigger cascade effects through credit markets, insurance systems, and broader financial networks. The conceptual framework identifies transmission channels including credit rationing, insurance premium escalation, collateral devaluation, and fire sales that could amplify localized stranding into systemic

crises (Bauer & Rudebusch, 2023). The study concludes that addressing stranded asset risk requires fundamental reforms to valuation methodologies, enhanced regulatory frameworks, and coordinated supervision across energy and financial sectors. This paper contributes to emerging scholarship on climate finance and systemic risk by providing theoretical foundations for understanding how climate inaction in real estate markets threatens global financial stability.

Keywords: Stranded assets; real estate; financialization; systemic risk; climate transition; property valuation; energy policy; financial stability; climate risk; asset stranding

Introduction

The concept of stranded assets has emerged as a critical concern in climate finance discourse, yet its application to the global real estate sector remains surprisingly underdeveloped (Warren-Myers & Hurlimann, 2022). Stranded assets are defined as assets that have suffered from unanticipated or premature write-downs, devaluation, or conversion to liabilities due to environmental changes, policy shifts, or technological disruption (Coulson et al., 2024). The global real estate sector, representing a substantial portion of global investment wealth and household assets, stands at the frontline of climate-related stranding risks, yet the mechanisms through which environmental policy transitions could devalue property assets remain inadequately understood (Addoum et al., 2024). Estimates suggest that climate-related stranding could affect up to $16 trillion in residential real estate assets and $5 trillion in commercial assets globally, representing losses comparable to or exceeding those of the 2008 financial crisis (Warren-Myers & Hurlimann, 2022). The financialization of real estate over recent decades has created deep integration between property markets and global capital markets, meaning that localized asset stranding could propagate through financial networks to create systemic risks (Zhou et al., 2023).

Understanding the stranded asset threat is critical for investors, lenders, regulators, and policymakers seeking to navigate the transition to a low-carbon economy (Bauer & Rudebusch, 2023). Climate change and associated environmental policy responses present both physical risks to property assets and transition risks as regulatory frameworks evolve (Nguyen et al., 2022). The interaction between these risks and the institutional structures of global real estate markets creates complex dynamics that require careful theoretical elaboration (Coulson et al., 2024). This conceptual paper addresses this challenge by developing a comprehensive framework for understanding climate-related stranded assets in real estate as a source of systemic financial risk (Addoum et al., 2024). The framework integrates insights from real estate economics, climate finance, financialization research, and systemic risk theory to identify transmission channels and amplification mechanisms through which localized stranding could generate broader financial instability (Warren-Myers & Hurlimann, 2022).

Literature Review

1. Stranded Assets in Real Estate: Conceptual Foundations

The concept of stranded assets is not new to real estate, as changing consumer demand and technological shifts have regularly rendered property assets redundant or obsolete throughout history (Warren-Myers & Hurlimann, 2022). However, what is new is the influence of climate change and associated environmental policy on property assets, creating stranding risks that are systemic rather than localized (Coulson et al., 2024). Climate-related stranding differs from traditional obsolescence in several important respects, including the scale of potential impacts, the speed of policy-driven change, and the interconnectedness of global property markets through financialization (Addoum et al., 2024). The wide urban context of the international perspective reveals the need for caution in generalization, as each international property market contains highly specific contexts that are contingent and socially produced (Kiviaho & Toivonen, 2023). Despite these caveats, the magnitude of potential stranding suggests that this is a risk that cannot be ignored (Warren-Myers & Hurlimann, 2022).

Adapting theories of lock-in and path dependence, research has identified two not necessarily mutually exclusive explanations for the silence of climate-related stranded assets in global real estate markets (Addoum et al., 2024). First, the real estate market may have digested the stranded asset threat and decided that environmental legislation will be sufficiently diluted that stranding will not impact global real estate assets (Coulson et al., 2024). Second, the institutions and traditional ways of working in the real estate market may be largely blind to the stranded asset threat, locked into traditional ways of working that simply do not account for it (Warren-Myers & Hurlimann, 2022). Both positions are untenable, as they leave real estate assets and the investors and communities, they serve prone to an uncertain future (Nguyen et al., 2022). The failure to adequately address stranded asset risks reflects deeper institutional challenges that require systematic theoretical analysis (Bauer & Rudebusch, 2023).

2. Path Dependence and Institutional Lock-in

Path dependence theory provides a powerful lens for understanding why real estate markets have been slow to incorporate climate risks into valuation and investment practices (Warren-Myers & Hurlimann, 2022). The history of how we got where we are is important in understanding global real estate markets, built environments, and related institutions (Addoum et al., 2024). Research suggests that traditional ways of working are locked into regressive valuation methodologies, and that this, in part, accounts for the silence afforded to stranded assets in real estate practice (Coulson et al., 2024). Institutional lock-in creates barriers to change, as established practices, professional norms, and regulatory frameworks reinforce existing approaches even when they become increasingly inadequate for emerging challenges (Nguyen et al., 2022). This path-dependent nature of real estate valuation has significant implications for understanding how climate risks are, or are not, transmitted through financial systems (Bauer & Rudebusch, 2023).

Path dependence operates at multiple levels in real estate markets, including valuation practices, investment criteria, regulatory frameworks, and professional education (Warren-

Myers & Hurlimann, 2022). Traditional valuation methodologies typically focus on historical transaction data and current market conditions, with limited incorporation of forward-looking climate risks (Addoum et al., 2024). This creates a systematic blind spot that may persist even as climate risks become more evident in market data (Coulson et al., 2024). The path-dependent nature of real estate valuation suggests that policy intervention may be necessary to overcome institutional inertia and accelerate the incorporation of climate risks into property pricing (Orazalin et al., 2024). Without such intervention, the mispricing of climate risks could continue to build, creating increasingly dangerous systemic vulnerabilities (Zhou et al., 2023).

3. Financialization and Systemic Risk Transmission

Financialization provides a critical lens for connecting property practices and techniques in global real estate markets to broader financial system dynamics (Zhou et al., 2023). Research reveals a new global asset risk in parts of global real estate that have been financialized for many decades, presenting a new emphasis for financialization research (Warren-Myers & Hurlimann, 2022). Contemporary research typically focuses on newly financialized assets, but this reveals what may happen to financialized products further down the line following disruption and reconfiguration (Addoum et al., 2024). The deep integration of real estate into global capital markets creates transmission channels through which climate-related devaluation could propagate through financial networks (Bauer & Rudebusch, 2023). This financialization of real estate has created both opportunities for capital mobilization and vulnerabilities to systemic shocks (Nguyen et al., 2022).

Socio-technical system theory has been used to show how Energy Performance Certificates and associated minimum energy regulation have the potential to hardwire and connect valuation risk into global capital markets (Coulson et al., 2024). The informational by-products of such regulations can be used to reveal the potential magnitude of stranded assets (Warren-Myers & Hurlimann, 2022). The transmission of climate risks through financial systems involves multiple channels including credit rationing, collateral devaluation, insurance premium escalation, and forced asset sales (Zhou et al., 2023). The banking sector, as a financial accelerator, can promote the contagion of climate change risks and even lead to the emergence of systemic risk (Bauer & Rudebusch, 2023). These transmission mechanisms require careful theoretical elaboration to understand how localized stranding could generate broader financial instability (Addoum et al., 2024).

4. Scale and Magnitude of Stranding Risk

The potential magnitude of climate-related stranded assets in real estate is substantial, with estimates suggesting $16 trillion in residential assets and $5 trillion in commercial assets at risk (Warren-Myers & Hurlimann, 2022). For comparison, this corresponds to several multiples of financial losses incurred during the 2008 financial crisis (Coulson et al., 2024). The stranded asset literature shows important potentials for financial instability that emerge from escaping carbon lock-in, focusing less on financial instability as such than on sources of financial instability (Zhou et al., 2023). System fragility emerges progressively as imbalances build up through time, and an important question is the extent to which asset stranding will be a decisive source of imbalances that may degenerate into financial instability (Bauer & Rudebusch, 2023).

The time distribution of asset stranding depends on the technology and sector considered, with stranded assets in different sectors becoming problematic at different times (Addoum et al., 2024).

The downstream high-carbon and real estate sectors bear 62% of the climate-related risk from the mining sector, which is further transmitted to the financial sector through capital linkages (Nguyen et al., 2022). This transmission risk is then amplified by the financial accelerator effect, potentially resulting in significant credit losses (Zhou et al., 2023). The magnitude of potential losses suggests that stranded asset risks in real estate represent a significant threat to financial stability that requires urgent policy attention (Warren-Myers & Hurlimann, 2022). However, the precise mechanisms through which stranding would propagate through financial systems remain poorly understood, highlighting the need for conceptual frameworks that can guide both academic research and policy development (Coulson et al., 2024).

Methodology

This study adopts a conceptual research methodology based on comprehensive review and theoretical synthesis of literature across multiple disciplines (Leavy, 2022). The conceptual research design enables the systematic integration of diverse literature streams to generate new theoretical insights, which is particularly appropriate for emerging topics requiring theoretical elaboration before empirical investigation can proceed (Salter, 2023). This study employs a comprehensive review of existing theoretical and empirical literature, drawing from real estate economics, climate finance, financialization research, and systemic risk theory (Addoum et al., 2024; Coulson et al., 2024; Warren-Myers & Hurlimann, 2022). The conceptual framework is developed through iterative synthesis of key concepts, mechanisms, and relationships identified in the literature (Hunziker & Blankenagel, 2024). The resulting framework identifies transmission channels and amplification mechanisms through which climate-related stranding in real estate could generate systemic financial risks (Takona, 2024). Secondary data from published research, policy documents, and industry reports inform the conceptual development process (Barkham et al., 2022). This methodology aligns with established practices in conceptual research, where the goal is theory building rather than empirical testing (Leavy, 2022; Salter, 2023).

Results and Discussion

1. The Conceptual Framework: Transmission Channels

The conceptual analysis identifies three primary transmission channels through which climate-related stranded assets in real estate generate systemic financial risk (Zhou et al., 2023). Credit channel transmission operates through mortgage lending, as property devaluation erodes collateral values and increases default risk for real estate loans (Bauer & Rudebusch, 2023). Bank balance sheets are exposed to real estate assets through direct lending, creating contagion risks as stranding propagates through the financial system (Nguyen et al., 2022). Capital market

transmission operates through real estate investment trusts, securitized products, and institutional investment portfolios that link property values to broader financial markets (Addoum et al., 2024). Insurance transmission operates through coverage withdrawal, premium escalation, and the potential insolvency of insurers exposed to climate-related property claims (Warren-Myers & Hurlimann, 2022). These transmission channels interact with each other and with amplification mechanisms to generate systemic risk (Coulson et al., 2024).

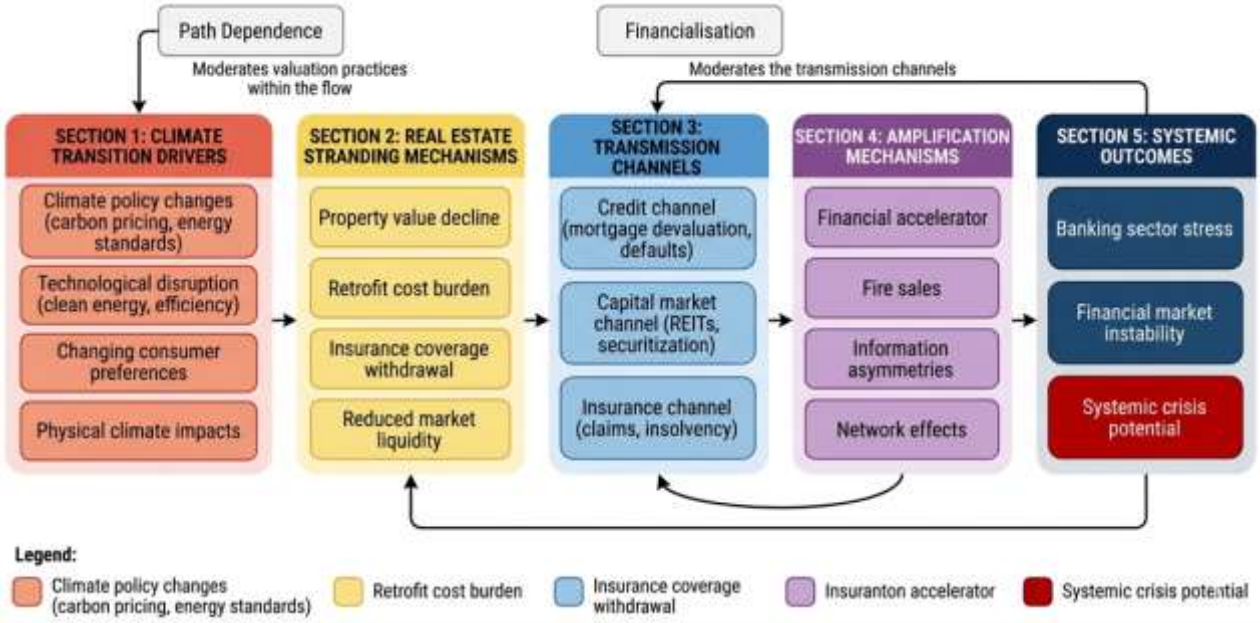

FIGURE 1: Conceptual Framework: Stranded Assets and Systemic Risk in Financialized Real Estate Markets

The framework reveals that credit channel transmission represents the most immediate and potentially dangerous pathway for systemic risk propagation (Bauer & Rudebusch, 2023). Commercial mortgage-backed securities and other securitized products create linkages between property performance and capital market stability (Nguyen et al., 2022). The erosion of collateral values triggers margin calls, forced asset sales, and balance sheet deterioration that can cascade through financial networks (Zhou et al., 2023). Insurance channel transmission amplifies these effects through premium escalation that reduces property cash flows and values, creating reinforcing feedback loops (Warren-Myers & Hurlimann, 2022). The interaction of these channels suggests that even localized stranding could generate broader systemic effects (Addoum et al., 2024).

2. Amplification Mechanisms

The analysis reveals four amplification mechanisms that could transform localized stranding into systemic financial crisis (Zhou et al., 2023). The financial accelerator effect amplifies initial shocks through credit constraints and balance sheet effects, creating feedback loops that magnify devaluation (Bauer & Rudebusch, 2023). Information asymmetries create price discovery challenges, as the true extent of climate risks may be poorly understood and mispriced (Addoum et al., 2024). Fire sale dynamics can accelerate devaluation as distressed asset sales create downward price pressure that affects broader markets (Warren-Myers &

Hurlimann, 2022). Network effects propagate risks through interconnected financial institutions, creating cascade effects that can overwhelm individual risk management systems (Nguyen et al., 2022). These amplification mechanisms suggest that systemic risk from stranded assets could significantly exceed the sum of individual asset devaluations (Coulson et al., 2024).

The framework shows that the financial accelerator effect is particularly significant in real estate markets due to the high leverage typically employed in property investment (Bauer & Rudebusch, 2023). Declining property values reduce borrower equity and increase loan-to-value ratios, triggering lender responses that further depress prices (Nguyen et al., 2022). Fire sale dynamics amplify these effects as distressed sales create new market benchmarks that devalue other properties (Zhou et al., 2023). Network effects transmit these dynamics across financial institutions through interconnected exposures, creating the potential for systemic crisis (Warren-Myers & Hurlimann, 2022). The framework emphasizes the interaction between mechanisms, with amplification effects reinforcing each other in ways that can rapidly escalate local problems into systemic crises (Addoum et al., 2024).

3. Institutional Barriers to Resilience

The conceptual framework identifies institutional barriers that inhibit effective response to stranded asset risks (Warren-Myers & Hurlimann, 2022). Valuation lock-in reflects path dependence in professional practices that systematically exclude climate risks from property valuations (Addoum et al., 2024). Regulatory fragmentation creates coordination failures across energy, financial, and real estate policy domains (Coulson et al., 2024). Information gaps reflect limited disclosure and data availability regarding climate risk exposure (Nguyen et al., 2022). Capacity constraints limit the ability of market participants to assess and manage climate-related risks effectively (Orazalin et al., 2024). These barriers interact with each other to create systemic resistance to change, even as climate risks become increasingly evident (Bauer & Rudebusch, 2023).

The framework reveals that valuation lock-in represents perhaps the most significant barrier to resilience (Warren-Myers & Hurlimann, 2022). Traditional valuation methodologies have developed over decades without systematic consideration of climate risks, creating deep path dependence that is difficult to overcome (Addoum et al., 2024). Professional norms and education reinforce these established practices, while regulatory frameworks often mandate or implicitly endorse them (Coulson et al., 2024). Overcoming this lock-in requires coordinated action across multiple institutional domains, including professional education, regulatory reform, and market incentives (Orazalin et al., 2024). The framework suggests that voluntary market action alone is unlikely to overcome these institutional barriers, highlighting the need for policy intervention (Zhou et al., 2023).

4. Implications for Financial Stability

The analysis suggests that climate-related stranded assets in real estate present a significant threat to financial stability that requires urgent policy attention (Warren-Myers & Hurlimann, 2022). The scale of potential stranding, estimated at $16 trillion in residential and $5 trillion in

commercial assets, represents losses comparable to or exceeding those of the 2008 financial crisis (Coulson et al., 2024). The deep integration of real estate into global capital markets through financialization creates transmission channels through which localized stranding could propagate through financial networks (Zhou et al., 2023). The banking sector, as the primary provider of mortgage credit, is particularly exposed to real estate devaluation (Bauer & Rudebusch, 2023). These findings have significant implications for financial supervision, macroprudential policy, and climate risk management (Nguyen et al., 2022).

The framework suggests that addressing stranded asset risk requires a fundamental rethinking of financial supervision and regulation (Orazalin et al., 2024). Traditional approaches to financial stability have not systematically incorporated climate risks, creating vulnerabilities that could be exposed by policy transitions (Zhou et al., 2023). Macroprudential policy tools need to be adapted to address climate-related risks, including capital requirements, stress testing, and disclosure mandates (Bauer & Rudebusch, 2023). The framework highlights the importance of coordinated action across energy, financial, and real estate policy domains to address the systemic nature of stranded asset risks (Warren-Myers & Hurlimann, 2022). Without such coordination, the transition to a low-carbon economy could generate significant financial instability (Addoum et al., 2024).

Conclusion

This conceptual paper has developed a comprehensive framework for understanding climate-related stranded assets in real estate as a source of systemic financial risk. The analysis reveals that path dependence and institutional lock-in in real estate valuation practices have created systematic blind spots to climate risks, while financialization has integrated property markets into global financial systems in ways that create systemic transmission channels. The potential magnitude of stranding, estimated at $16 trillion in residential and $5 trillion in commercial assets, suggests that climate inaction in real estate markets could generate financial instability comparable to or exceeding the 2008 financial crisis. The framework identifies transmission channels including credit rationing, collateral devaluation, and insurance premium escalation, with amplification mechanisms including financial accelerator effects and fire sale dynamics. The study also identifies institutional barriers, including valuation lock-in and regulatory fragmentation, that inhibit effective response to stranded asset risks. This paper contributes to emerging scholarship on climate finance and systemic risk by providing theoretical foundations for understanding how climate inaction in real estate markets threatens global financial stability. The conceptual framework offers a foundation for empirical investigation and policy development aimed at addressing the systemic risks posed by climate-related stranded assets in financialized real estate markets.

Recommendations

Based on the conceptual analysis, several recommendations emerge for addressing stranded asset risks in real estate markets. First, valuation professionals should develop methodologies that systematically incorporate climate risks and transition scenarios, overcoming path

dependence in traditional practice. Second, regulators should mandate climate risk disclosure for real estate assets and integrate climate stress testing into financial supervision frameworks. Third, policymakers should coordinate across energy, financial, and real estate policy domains to ensure coherent approaches to transition risk management. Fourth, financial institutions should reduce carbon exposure of credit assets through diversified green investments and proactive risk management. Fifth, international organizations should develop guidance and best practices for stranded asset assessment and management in real estate. Sixth, researchers should conduct empirical studies validating transmission mechanisms across different property types, geographic markets, and regulatory contexts. Finally, supervisors should incorporate climate-related stranded asset risks into macroprudential policy frameworks to ensure financial stability in the context of climate transition.

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The author(s) declare no competing interests.

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