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Research for Institutional Money Management

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INTRODUCTION

Introduction to the Research for Institutional Money Management Supplement in *Pensions & Investments*, August 2026

Timothy Whittaker
Director
EDHEC Infrastructure & Private Assets Research Institute

We at EDHEC Infrastructure & Private Assets Research Institute are grateful to Pensions & Investments for the opportunity to present this special supplement focusing on the global private assets market. This is an industry that is navigating one of its most consequential periods in decades, and the questions that institutional investors are asking have rarely felt more urgent.

The conventional wisdom on private assets is being tested on multiple fronts. In the following pages, you will find insight into the most pertinent findings from our research team. Our analysts examine some of the fault lines in private asset investment assumptions – and what the evidence actually shows.

Our first article takes a look at popular methods for valuing private assets – and the many problems they present, often systematically unreliable, updated too infrequently, rarely truly independent, and structured to smooth away volatility that doesn't actually disappear. Investors need a shift away from this illusion of fair valuation; we argue for procedural reform, delivering more reliable estimates with minimum revaluation frequencies, event-triggered re-marking, and independent valuation committees. Valuation governance is not a box-ticking exercise; it should be treated as a systemic safeguard rather than an accounting technicality.

Next, we take a look at the constant underestimation of volatility in unlisted infrastructure investments that is delivered by appraisal-based valuations. These all too frequently produce implausibly high Sharpe ratios and misleading assessments of risk. We reveal that true total-return volatility is several times the guesstimates of appraisal figures. A realistic volatility estimate is not a technical refinement; it changes the decisions institutions make and reshapes the role of infrastructure across the institutional landscape.

In our third piece we summarize developments in the regulation of valuations. There is good news here for investors, as valuation is finally beginning to be treated as a governance and accountability issue, not merely a technical or back-office function. Many of the most significant global regulatory bodies are taking a proactive approach, and expectations for mandatory requirements include named accountability, functional independence, trigger-based revaluation, model validation, and a tested pathway from pricing error to investor remediation. IOSCO, the FCA, Luxembourg's CSSF, and Australia's APRA/ASIC set out the most detailed operational expectations; the US, though lacking a current formal rule, remains actively engaged.

Our final paper looks at another concerning valuation issue for investors: private asset valuations systematically understate exit prices in every year of the decade studied. And by no small amount – median uplifts are around 20%, in breach of fair value principles. We warn that this mispricing poses growing fiduciary and regulatory risks. Because the trusts studied invest through many of the world's leading private asset managers, the findings are indicative of industry-wide practice. Routine back-testing of carrying values against realized exits should be a standard component of valuation governance.

These articles bring together EDHEC Infrastructure & Private Assets Research Institute's latest independent, evidence-based research on institutional private markets, examining the fault lines in established assumptions and what the evidence actually shows. I hope you find them valuable.

This supplement exists because Pensions & Investments shares our conviction that rigorous research has a practical role to play in how institutions allocate capital. We thank them for that partnership.

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contributors

Frédéric Blanc-Brude
Affiliated Researcher and CEO
Scientific Infra & Private Assets

Demi Chung
Senior Researcher and Head of Accounting Standards & Financial Reporting Doctrine and Practices
EDHEC Infrastructure & Private Assets Research Institute

Evan Clark
Senior Private Markets Analyst
EDHEC Infrastructure & Private Assets Research Institute

Abhishek Gupta
Affiliated Researcher and Head of Business
Scientific Infra & Private Assets

Nastaran Bayat Patapeh
Risk Analyst
EDHEC Infrastructure & Private Assets Research Institute

Timothy Whittaker
Director
EDHEC Infrastructure & Private Assets Research Institute

Beyond the Illusion of Stability: Valuation Discipline in Private Markets

Timothy Whittaker
Director
EDHEC Infrastructure & Private Assets Research Institute

- Private market valuations are often unreliable – infrequently updated, rarely independent, and structured to smooth away volatility that doesn't disappear.
- Blackstone's Real Estate Investment Trust illustrates the problem: its appraisal-based NAV barely moved during the COVID shock and 2022–23 rate cycle while comparable listed REITs fell by around a third of their value.
- The consequences ripple across the institutional landscape because calculations at every level are based on estimates that don't reflect reality.
- We call for procedural reform – minimum revaluation frequencies, event-triggered re-marking and independent valuation committees – and argue that valuation discipline is essential, not an accounting technicality.

THE PRICE OF OPACITY

Private markets have undergone a structural transformation over the past two decades. What was once a niche allocation has become a core pillar of institutional portfolios worldwide. Global private market assets under management surpassed USD13 trillion in 2023, growing at double-digit annual rates since 2010, and are projected to reach USD24.1 trillion by 2029. Pension funds, insurers, and sovereign wealth funds (SWFs) have collectively driven this growth, attracted by the prospect of yield enhancement, diversification, and access to long-duration assets aligned with long-term liabilities.

Yet as private markets have grown in scale and systemic importance, a fundamental governance question has remained unresolved: how credibly, frequently, and independently are these assets valued? The answer, across much of the industry, is not credibly enough, not frequently enough, and rarely with sufficient independence.

The consequences are not abstract. Inaccurate or stale interim valuations distort member account balances in defined contribution pension schemes, misrepresent solvency in defined benefit funds and insurance companies, impair the risk management and countercyclical investment capacity of SWFs, and suppress the market information needed for efficient price discovery in secondary markets. They create hidden wealth transfers between investor cohorts, delay corrective action until crises become unavoidable, and provide fund managers with the discretion to present performance in ways that serve their commercial interests rather than the informational needs of investors.

The smoothing problem

At the heart of the valuation challenge is a phenomenon known as return smoothing. Because private assets are not continuously traded, their valuations depend on periodic appraisals that rely on modeled assumptions – such as: discount rates, growth forecasts and market multiples – rather than observable market prices. When these inputs are updated infrequently, or when managers exercise discretion in their selection, reported valuations systematically understate the volatility of the underlying economic exposure.

The result is a reported return series that appears smoother, less volatile, and less correlated with public markets than the true exposure warrants. However, this is not a neutral presentation of reality. It misrepresents risk inherent in these assets. And critically, it does not make the underlying volatility disappear; it defers and concentrates it. When corrections eventually come, whether forced by a transaction, a market dislocation, or regulatory scrutiny, they arrive suddenly, in a correlated fashion, and at precisely the moment when institutional investors are least able to absorb them.

Smoothing also suppresses information across the system. When many funds simultaneously report stable values for assets whose economic reality has deteriorated, policymakers, boards, and regulators lose the signals they need to act. Hidden losses accumulate until they can no longer be concealed. The resulting correction amplifies rather than dampens systemic stress.

STABILITY AS THEATRE: THE BREIT ILLUSTRATION

The dynamics of valuation smoothing are vividly illustrated by the experience of non-traded net asset value (NAV) real estate investment trusts (REITs) during two recent market dislocations: the COVID-19 shock of 2020 and the 2022–23 interest rate tightening cycle. Blackstone Real Estate Income Trust, or BREIT, one of the largest and most closely scrutinized non-traded REITs, provides a particularly instructive case.

BREIT invests in broadly similar underlying property markets to listed US REITs. During the COVID-19 shock, the FTSE Nareit Equity REITs Index, a proxy for mark-to-market pricing of comparable assets, fell by approximately 39% in a matter of weeks, before recovering as monetary conditions eased. BREIT's appraisal-based NAV adjusted gradually, reporting a fraction of the listed market's peak-to-trough decline. During the 2022–23 rate tightening cycle, listed REITs again fell sharply, by around 32% at the trough whilst BREIT's reported NAV remained close to its prior level. Figure 1 tracks estimated index levels for both, normalized to 100 in January 2017.

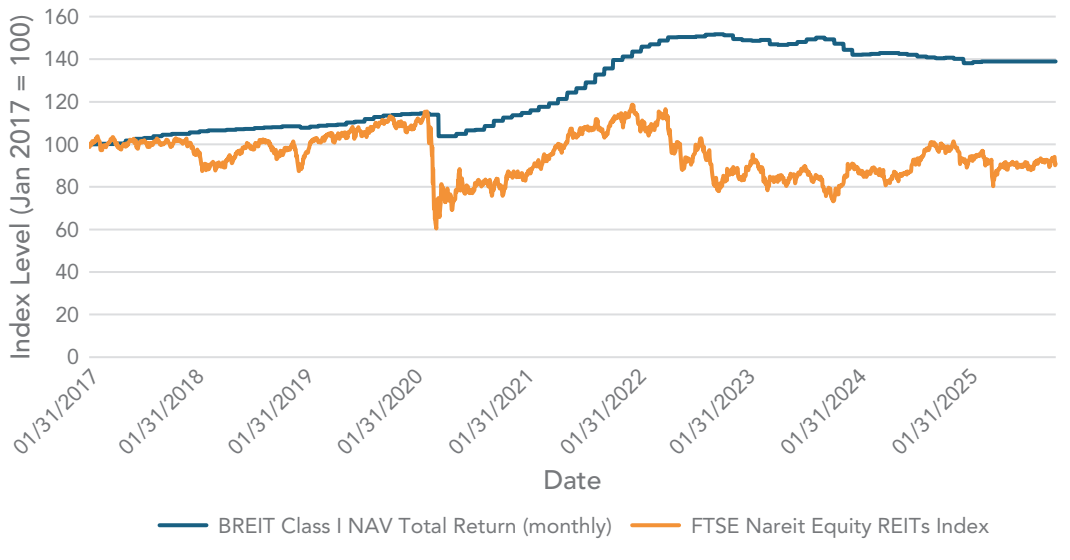
The divergence is not evidence of superior management or a genuinely different risk profile. It is a consequence of valuation methodology.

FIGURE 1

BREIT vs listed REITs: smoothed NAV and traded prices

Notes: Estimated BREIT Class I NAV vs FTSE Nareit Equity REITs Index (Jan 2017 = 100). Listed REITs reflect mark-to-market pricing; BREIT NAV reflects appraisal-based smoothing. Both invest in broadly similar underlying property markets.

Source: Bloomberg; EDHEC analysis.



BREIT's appraisal-based approach, updated monthly using modeled assumptions, absorbs market shocks gradually. Listed REITs, priced continuously by market participants, reflect new information immediately.

The systemic implication is more serious than it may first appear. Smoothed marks suppress information about losses in a common direction across multiple funds simultaneously. The idiosyncratic component of fair-value noise, the genuine uncertainty in any single asset's valuation, tends to diversify away across a portfolio. But a regime of smoothed marks suppresses information in a common direction, amplifying the systematic component of risk and making market swings more correlated when the correction finally arrives. The small, continuous pain of marking assets at fair value in real time is, in this sense, an insurance premium against the concentrated pain of a cliff-edge restatement during a crisis.

TABLE 1

Institutional channels and consequences of valuation failure
Source: EDHEC analysis.

Institution	Primary Risk Channel	Consequence of Delay or Inaccuracy
Defined contribution pension funds	Member equity and unit pricing	Cross-subsidization between cohorts; liquidity mismatch; regulatory enforcement
Defined benefit pension funds	Solvency and funding ratios	Overstated funding; deferred contributions; intergenerational inequity
Insurance companies	Regulatory capital and liquidity	False solvency ratios; asset-liability mismatch; amplified systemic risk
Sovereign wealth funds	Governance and fiscal accountability	Impaired stabilization capacity; loss of public trust; fiscal misallocation

VALUATIONS AS GOVERNANCE INFRASTRUCTURE

Beyond their role in risk measurement, interim valuations perform a fundamental governance function. In private funds, limited partners delegate control over capital to general partners but retain residual claims on returns. This creates a classic principal-agent problem: without credible, independently verifiable performance assessments, investors cannot ensure that managers adhere to investment mandates, deploy capital responsibly, or report results honestly.

The opportunities for opportunistic behavior are well documented. Managers may smooth valuations to inflate reported performance, delay the recognition of losses to avoid adverse investor reactions, or selectively disclose information that supports their fundraising and compensation objectives. Interim valuations that are accurate, transparent, and independently reviewed constrain this discretion.

The informational function of valuations extends to secondary markets, where GP-reported NAVs frequently serve as anchor prices for transaction negotiations. Research has demonstrated that interim valuation patterns are predictive of final investment outcomes and that funds with more frequent reporting display reduced information asymmetry in their LP communications (Ercan et al., 2025). Credible interim marks thus support not only internal governance but also the development of a more liquid and efficient secondary market, an outcome the entire private markets industry benefits from.

Valuations also determine the fairness of outcomes between investor cohorts. In funds that allow secondary sales, redemptions, or restructuring transactions, inaccurate pricing creates systematic wealth transfers. If valuations are inflated at the point of entry, new investors overpay. If they are understated at exit, sellers are disadvantaged. These are not hypothetical concerns; they have given rise to regulatory enforcement actions and, in the defined contribution pension context, to compensation requirements for affected members.

CONSEQUENCES ACROSS THE INSTITUTIONAL LANDSCAPE

The consequences of poor valuation governance are not uniform. They vary according to the institutional context in which private assets are held, the promises made to beneficiaries, the regulatory framework in force, and the role the institution plays in the broader financial system. Table 1 sets out the primary channels through which valuation failures transmit to each of the four principal institutional stakeholder types.

Defined contribution pension funds

Defined contribution schemes face a structural contradiction at the heart of their design. Members are able to transact daily, switching investment options, taking transfers, or commencing drawdown, yet the portfolios in which their savings are invested increasingly include private assets whose valuations are updated monthly, quarterly, or less frequently. When reported NAVs lag actual market conditions, members who transact at the wrong moment relative to a revaluation cycle do so at prices that do not reflect current economic value.

This is not a marginal concern. The 2024 review of superannuation funds by the Australian Prudential Regulation Authority (APRA) found sector-wide weaknesses in revaluation frequency and triggers for unlisted assets (APRA, 2024). The HESTA case, in which a large superannuation fund applied the results of a COVID-related out-of-cycle revaluation to different investment options at different times, resulted in some members transacting at materially incorrect prices. APRA concluded the process was inequitable and required compensation to affected members. Similar dynamics prompted multiple UK open-ended property funds to gate redemptions following the 2016 Brexit referendum and again during the COVID-19 pandemic, after independent valuers invoked material valuation uncertainty clauses.

Beyond individual transaction fairness, valuation smoothing in DC funds distorts performance measurement, complicates fee calculation, and encourages member behaviors that are misaligned with the true risk profile of the fund. Members who see apparently stable reported values may allocate more aggressively to illiquid assets than their risk tolerance warrants and could face a sudden shock when valuations eventually adjust.

Defined benefit pension funds

In defined benefit schemes, the primary consequence of valuation inaccuracy falls on the funding ratio, the ratio of asset fair value to the present value of accrued liabilities. Under IAS 19 and IAS 26, plan assets are recognized at fair value. When unlisted asset valuations are stale or inflated, schemes appear better funded than they are, with direct consequences for contribution requirements, benefit decisions, and investment strategy.

Overvalued assets suppress employer contributions and can lead trustees to approve benefit enhancements the scheme cannot sustain. When market corrections eventually expose the shortfall, the required increase in contributions is abrupt, pro-cyclical, and often comes at the worst possible moment for the sponsoring employer. Research by Andonov et al. (2021) has demonstrated that infrastructure investments via closed-end private vehicles behave with volatility and cyclicality comparable to private equity, challenging the widespread perception of these assets as low-risk, stable contributors to DB portfolios.

A second distortion, often termed the diversification illusion, arises from the serial correlation inherent in smoothed private asset returns. Because smoothed valuations change infrequently, they appear to have low volatility and low correlation with public markets, making them look like attractive diversifiers. In reality, the measured diversification benefit overstates the true reduction in portfolio risk. A DB scheme that over-allocates to unlisted assets on this basis may be taking on substantially more systematic risk than its models suggest, leaving it exposed to severe correlated drawdowns during market-wide stress events.

Valuation inaccuracy in DB funds also creates intergenerational inequity. Members who retire or transfer out when unlisted assets are overvalued extract more than their fair share of scheme assets. The remaining members are left in a scheme that is effectively underfunded, a wealth transfer from younger and future members to those departing, which runs directly contrary to the collective nature of the defined benefit promise.

Insurance companies

For insurance companies, the valuation of unlisted and illiquid assets is a core input into prudential supervision, regulatory capital calculation, and financial stability assessment. Under Solvency II in the European Union and Risk-Based Capital frameworks in the United States, insurers must measure assets and liabilities at fair value, with solvency ratios, capital buffers, and liquidity positions all derived from these fair-value measures.

A single stale or inflated valuation can create a materially misleading picture of an insurer's solvency position. Overvalued assets inflate the Solvency Capital Requirement headroom, delaying supervisory intervention and concealing emerging vulnerabilities. Undervalued assets produce the opposite distortion, compelling firms to hold excess capital, reducing investment efficiency, and distorting risk-taking incentives. The International Association of Insurance Supervisors is explicit on this point: inaccurate valuations can overstate or understate the financial condition of an insurer, undermining both prudential oversight and market confidence.

The liquidity implications are equally serious. A stale or over-optimistic asset valuation can mislead firms about their ability to access liquidity or post collateral under stress. This dynamic was vividly illustrated during the UK gilt-market crisis of late 2022, when sharp yield increases forced liability-driven investment programs to meet unexpected margin calls, precipitating forced sales and a rapid evaporation of market liquidity. Insurers and other large balance-sheet institutions that rely on illiquid or hard-to-liquidate assets face comparable risks when their reported valuations diverge from what those assets could realistically be sold for under stress conditions.

The systemic dimension of insurance valuation failures is particularly significant. When divergent

valuation methodologies and inconsistent update frequencies persist across many institutions simultaneously, they create macroprudential blind spots. If unlisted assets are collectively overvalued across the sector, it appears stronger and more liquid than it truly is, encouraging additional leverage, credit expansion, and risk-taking during upswings. When valuations eventually adjust, the simultaneous tightening of balance sheets amplifies the downturn through forced deleveraging, asset sales, and reduced new lending. Accurate and timely valuation of unlisted assets is not, for insurers, a narrow technical issue. It is a systemic safeguard.

Sovereign wealth funds

SWFs, as stewards of national wealth, are accountable not to individual members or policyholders but to citizens, legislators, and future generations. This accountability relationship makes valuation transparency a matter of public governance, not merely institutional practice.

The temptation for SWFs to deprioritize frequent revaluations is understandable. Their investment horizons are genuinely long, often intergenerational, and interim marks may seem irrelevant to strategies designed to deliver value over decades. This logic is flawed on several grounds. First, without timely valuations, internal risk management and portfolio rebalancing decisions rest on outdated data, impairing the strategic asset allocation that is the SWF's primary function. Second, valuation opacity undermines fiscal transparency and governance credibility. This creates space for suspicion about how national assets are being managed. Third, and most importantly, inaccurate valuations impair the SWF's ability to perform its macroeconomic stabilization role.

Many stabilization-oriented SWFs are explicitly designed to act as countercyclical shock absorbers, accumulating assets in good times and deploying capital when adverse shocks hit the domestic economy. To act decisively in a downturn, SWF managers must have confidence in their own balance sheets. Accurate, timely valuations function as a license to act: they make visible the true scale of existing losses and the amount of capital that can be deployed without breaching fiscal or risk constraints. When valuations are stale, funds operate under heightened uncertainty and may delay intervention, undermining their stabilization role at precisely the moment it is most needed.

A broader literature on illiquid asset valuation demonstrates that delayed markdowns and smoothed prices can create a collective valuation illusion that masks fragility and leads to abrupt corrections once hidden losses are recognized, amplifying rather than dampening volatility. When large public investors such as SWFs understate losses or lag in valuing unlisted holdings, these dynamics can mislead policymakers and financial markets about the true state of public balance sheets. Credible, market-relevant valuations give SWFs the information needed to act decisively and send a strong signal of confidence to markets, supporting macro-financial stability and public trust simultaneously.

A FRAMEWORK FOR VALUATION DISCIPLINE

Sound valuation governance in private markets requires more than the selection of an appropriate methodology. It requires a comprehensive framework that addresses how valuations are prepared, reviewed, documented, and challenged – and how that process is structured to be independent of the commercial incentives of those managing the assets being valued.

There are five governance dimensions that together constitute best practice (Table 2). These are not abstract principles. Each has direct operational implications for boards, investment committees, and valuation functions.

TABLE 2

EDHEC valuation governance framework; five dimensions of best practice for private market valuations

Governance Dimension	Core Principle	Illustrative Outcome
Economic substance	Capture true risk and reward – not legal or accounting form	Prevents contractual distortion in layered structures
Transparency & independence	Full audit trails; valuation function separated from portfolio management	Reduces optimism bias; builds external credibility
Timeliness & market consistency	Current market data; event-triggered re-marking; no smoothed or averaged inputs	Prevents accumulation of hidden losses
Methodological soundness	Consistent, evidence-based models; cross-validated; back-tested against exit prices	Ensures comparability across reporting periods
Purpose alignment	Scope and depth proportionate to use – reporting, regulation, or transaction pricing	Balances cost, complexity, and decision-usefulness

Economic substance: Looking through form

The most important governance dimension is economic substance. Valuations must reflect the real economic position of an asset, the genuine risk and reward profile, rather than its legal or accounting form. For infrastructure assets, this means capturing future cash flows, demand risk, and regulatory exposure rather than focusing on the surface structure of the entity holding the concession. For private equity, it means looking through the layered fee and carry structures to assess the true return to the ultimate capital provider.

This principle matters most for complex, layered ownership structures, common in infrastructure, real estate, and large buyout transactions, where legal form can obscure the actual distribution of economic risk. An informed market participant pricing the asset would look through these structures to the underlying economics. A credible valuation must do the same.

Independence: The structural safeguard

Independence in both process and oversight is essential to the integrity of any valuation framework. When portfolio managers or investment teams are directly involved in valuing the assets they manage, the structural incentives for optimism are powerful, particularly where performance fees, fundraising targets, or internal bonus structures depend on reported values.

Best practice requires an independent valuation committee with a mandate to review methodologies, challenge key assumptions, and approve valuations before reporting. Under APRA's Prudential Standard SPS 530, Australian superannuation trustees are now required to maintain exactly this structure, with documented board-level approval and regular, evidence-based challenge of revaluation triggers. The Solvency II framework imposes comparable requirements on European insurers. In the UK, The Pensions Regulator is explicit that delegation of valuation tasks to external managers does not absolve trustees of accountability: they are expected to challenge, verify, and document the bases of valuation judgments applied to scheme assets (The Pensions Regulator, 2024).

Timeliness: The event-trigger imperative

Many institutional investors define revaluation frequency by calendar schedule, quarterly or semi-annually, without specifying what events should prompt out-of-cycle revaluations. This is insufficient. Market environments can change rapidly and materially between scheduled valuation dates. A significant interest rate movement, a credit event affecting a key counterparty, a regulatory change affecting a concession, or an arm's-length transaction involving a comparable asset may all render a prior valuation materially misleading before the next scheduled update.

Best practice requires defined event-triggers for out-of-cycle revaluations, together with documented processes for identifying when those triggers have been met. Discount rates, risk premia, and other market-derived inputs should be updated using the latest available data at each valuation date, not smoothed across periods or anchored to historical benchmarks.

Back-testing: The accountability mechanism

Governance frameworks are only as credible as the accountability mechanisms that test them. Systematic back-testing, comparing interim valuations against subsequent realized transaction prices or observable market benchmarks, is the most direct way to assess whether valuation models are aligned with market reality. Persistent, unexplained deviations between modeled values and realized exit prices are a signal of model drift, optimism bias, or methodological mis-specification, and should trigger a formal review with escalation to the board.

This practice is embedded in the Solvency II framework for European insurers, which requires independent review and regular verification of valuation data, assumptions, and results. It should be standard governance practice across all institutional private market investors.

THE CASE FOR STRUCTURAL REFORM

The gap between what valuation standards require and what they actually deliver is, at its core, a regulatory design problem. IFRS 13, ASC 820, and the International Private Equity and Venture Capital (IPEV) Guidelines (IPEV, 2022) each provide a coherent conceptual definition of fair value. None prescribes how frequently it must be assessed, what events should trigger reassessment, or how the independence of the valuation process should be structured. This absence of procedural discipline has created a regime in which compliance is technically easy, comparability across funds is low, and the scope for managerial discretion is wide.

The consequence is that fair value, as it is actually practiced across much of the private markets industry, is as much a governance choice as an

accounting outcome. Different managers, auditors, and jurisdictions interpret market participant assumptions in fundamentally different ways. Valuation cycles for comparable asset classes vary from monthly to annually. Few funds disclose the sensitivity of their reported values to changes in unobservable parameters. This inconsistency undermines comparability and allows prolonged periods during which reported values reflect managerial judgment more than market reality.

What reform should look like

Supervisors should move beyond conceptual guidance toward procedural discipline. Minimum expectations should address valuation frequency, event-triggered re-marking, and the governance of key inputs – including explicit rules for updating discount rates, market multiple benchmarks, and cash-flow assumptions when market conditions change materially. Valuation cadence and input governance should be treated with the same rigor as capital adequacy requirements, central to prudential oversight, not peripheral to disclosure.

A coordinated approach across the Financial Stability Board, the International Organisation of Securities Commissions, and the European Insurance and Occupational Pensions Authority, and national prudential regulators would prevent the regulatory arbitrage that fragmented national requirements invite. The Solvency II experience in Europe, which mandates quarterly solvency calculations and fair-value balance-sheet updates without overburdening firms, demonstrates the feasibility of this approach. APRA's reforms in Australia and the SEC's 2023 private fund rules (SEC, 2023) (subsequently invalidated on procedural grounds but clear in intent) point in the same direction.

Periodic submission of valuation-methodology summaries and independent-review attestations to supervisors would allow early detection of divergence between reported and realized values, shifting the supervisory model from post-hoc audit to continuous risk monitoring.

Technology has removed the cost argument

The historical argument against more frequent valuations, that they are too costly, too subjective, and too data-limited to be meaningful, is no longer credible. Machine-learning techniques can systematically extract signals from observable market proxies, secondary transaction prices, listed comparable companies, credit spreads, macroeconomic indicators, to generate interim shadow marks that provide independent reference ranges for illiquid assets. When calibrated and governed appropriately, these models allow boards and independent committees to identify whether reported values deviate materially from model-implied ranges, without incurring the full cost of a quarterly independent appraisal for every asset.

Centralized transaction databases, analogous to the Trade Reporting and Compliance Engine (TRACE) system in fixed-income markets, would further support valuation integrity by providing auditable evidence of arm's-length pricing. Data-pooling initiatives by the Institutional Limited Partners Association (ILPA), the IPEV Board, and the OECD Infrastructure Data Initiative are already moving in this direction. Regulators could accelerate progress through safe-harbor provisions that allow anonymized trade data to be shared without breaching fund confidentiality.

The constraint on better valuation practice is no longer data availability or cost. It is the willingness, of managers, boards, and the industry as a whole, to accept that transparency is a mark of governance maturity rather than a concession of competitive advantage.

VALUATION DISCIPLINE AS FIDUCIARY PRACTICE

The case for valuation discipline in private markets is not primarily regulatory, though the regulatory direction of travel is clear. It is a matter of institutional integrity. Pension funds, insurers, and SWFs that hold private assets make promises to beneficiaries: defined benefit promises, policy obligations, or intergenerational stewardship mandates. The credibility of those promises depends, in part, on the credibility of the valuations that underpin reported solvency, funding ratios, and returns.

When valuations are stale, smoothed, or prepared without genuine independence, these institutions are not merely accepting a limitation of private market investing. They are participating in a fiction that serves the short-term interests of asset managers at the expense of the long-term interests of beneficiaries. The small, continuous discipline of marking assets at fair value in real time – accepting the volatility, managing the governance process, investing in the necessary independence structures – is an insurance premium against the concentrated harm that follows from deferred and distorted accounting.

Technology has removed the cost argument. Regulatory pressure is building. The remaining barrier is cultural: a willingness to treat transparency as competence rather than vulnerability, and to insist that the managers of private assets be held to the same standards of honest accounting that govern every other asset class in an institutional portfolio.

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The Volatility of Unlisted Infrastructure Investments: A Market-Consistent Estimate of Risk in Unlisted Infrastructure Equity

Frédéric Blanc-Brude
Affiliated Researcher and CEO
Scientific Infra & Private Assets

Abhishek Gupta
Affiliated Researcher and Head of Business
Scientific Infra & Private Assets

Nastaran Bayat Patapeh
Risk Analyst
EDHEC Infrastructure & Private Assets Research Institute

- Appraisal-based valuations systematically understate unlisted infrastructure volatility, producing implausibly high Sharpe ratios and misleading assessments of risk.
- Using 20 years of transaction data, we reveal true total-return volatility of 7–12% – several times appraisal figures.
- Risk stems from three sources: revisions to expected cash flows, interest-rate movements, and shifts in the infrastructure risk premium, none of which appraisals capture reliably.
- A realistic volatility estimate is not a technical refinement; it changes the decisions institutions make and reshapes the role of infrastructure across the institutional landscape.

THE COMFORT OF SMOOTHED NUMBERS

Infrastructure has become a core allocation for pension funds, insurers, and sovereign wealth funds (Inderst, 2010). Its long-dated cash flows, perceived resilience, and diversification benefits have earned unlisted infrastructure equity a reputation as a defensive, low-risk holding, and a natural match for long-term liabilities (Newell, Peng and De Francesco, 2011). Yet that reputation rests on fragile foundations. Most assessments of infrastructure risk rely on appraisal-based valuations that smooth returns and materially understate true market volatility. The asset class is routinely regarded as far calmer than it actually is – a misperception with direct consequences for portfolio construction, liability hedging, performance benchmarking, and regulatory capital.

The problem is well understood in principle but unresolved in practice. Decades of research on private and illiquid assets have documented that appraisal-based returns exhibit smoothing, serial correlation, and delayed adjustment to market conditions, producing artificially low volatility and implausibly high risk-adjusted returns (Geltner, 1991; Getmansky, Lo and Makarov, 2004). What that literature had not delivered for infrastructure was a way to measure the hidden risk directly, from market evidence, rather than simply diagnosing that appraisals are too smooth. Infrastructure makes this hard: assets are heterogeneous, transactions are infrequent, reliable listed comparables are scarce, and the data are proprietary. Closing that gap – producing a market-consistent estimate of the risk that smoothing conceals – is the purpose of this work.

How appraisals are built, and why they lag

Appraisals of unlisted infrastructure equity are typically produced using the income, or discounted-cash-flow, approach: the value of an asset is the sum of its expected future dividends, each discounted at a rate made up of a risk-free component for the relevant maturity plus a deal-specific equity risk premium. The logic is sound; the implementation is where the trouble begins. In practice the risk-free input is usually a moving average of long-term bond yields, and the risk premium is anchored to long-run assumptions, often derived from the capital asset pricing model. Both move only gradually.

Two further weaknesses compound the lag. Estimating a single asset beta under CAPM requires listed comparables that, for most unlisted infrastructure, simply do not exist, leaving beta estimates subjective and rarely revised. And the assumption that one public-equity risk premium captures all relevant risk ignores the multi-factor nature of asset pricing. The outcome is the familiar pattern of smoothed returns and stale pricing: reported net asset values drift gradually from historical cost but are never consistently re-anchored to observable market inputs – contrary to the fair-value principle set out in IFRS 13. Smoothing does not make volatility disappear; it defers and conceals it. If the volatility implied by appraisal NAVs were accurate, infrastructure would represent a near-arbitrage opportunity with extraordinarily high risk-adjusted returns (Merton, 1980). The more reasonable conclusion is that appraisal-based volatility does not reflect the true risk of the asset class (Amenc et al., 2020).

WHERE INFRASTRUCTURE RISK REALLY COMES FROM

Infrastructure is often viewed as low-risk because its revenues are long-term and its business models are stable. But from a fair-value perspective, risk arises from more than whether the cash flows arrive. A useful comparison is a 30-year US Treasury bond: although its cash flows are effectively risk-free and carry no risk premium, its ten-year total-return volatility exceeds 18%. That volatility is pure duration risk – the sensitivity of long-dated cash flows to changes in interest rates. Infrastructure equity, with dividends expected over several decades, is exposed to the same effect.

Unlike Treasury cash flows, however, infrastructure cash flows are not risk-free. Economic downturns can materially affect revenues, as the Covid-19 lockdowns demonstrated for airports, toll roads, ports, and other demand-sensitive assets. Across the 650-plus companies tracked in the Scientific Infra & Private Assets universe over two decades, we observe numerous defaults, dividend suspensions, bankruptcies, and public-sector terminations, concentrated in merchant business models and sectors hit by structural shocks. Infrastructure equity therefore commands a genuine risk premium – and that premium is itself a market price that moves with supply and demand. Taken together, the market value of unlisted infrastructure fluctuates for three reasons: changes in expected cash flows; changes in the market price of infrastructure risk; and changes in the term structure of interest rates. A credible measure of volatility must capture all three. Appraisals capture none of them reliably, because their gradually adjusting discount rates mask precisely the dynamics – interest-rate movements and shifts in the risk premium – that account for much of the true risk.

MEASURING RISK FROM THE MARKET, NOT THE MODEL

We re-examine the volatility of unlisted infrastructure equity using a market-consistent valuation framework built on more than twenty years of firm-level data from the Scientific Infra & Private Assets database, the largest structured dataset of unlisted infrastructure investments. The principle is straightforward: in equilibrium, expected returns equal fair-market discount rates. Rather than trusting reported NAVs, we extract the discount rates implied by observed secondary-market transactions and model how they move – recovering the evolving market price of infrastructure risk directly from prices investors actually paid.

The data and the universe

The framework rests on a representative view of the investable universe. Using TICCS®, an objective industry taxonomy, the database covers the 25 most active infrastructure markets globally, where price signals can be observed reliably. From several thousand identified companies and project vehicles, a sample of roughly 650 firms is constructed to match the evolving characteristics of the universe across TICCS segments, subject to inclusion criteria such as the availability of detailed financial statements. This sample underlies the infra300 index, which closely tracks the composition of the broader universe.

The design mitigates two common biases in contributed indices. Selection bias is reduced because constituents are sampled from a clearly defined population reflecting market structure at each point in time. Survivorship bias is avoided through a fill-forward approach: new firms enter as they become investable,

while exited or distressed firms remain in the historical record. Model calibration draws on more than 1,000 individually validated secondary-market transactions observed over twenty years, including 250-plus deals corresponding to firms tracked in the indices.

A three-step framework

First, for each observed transaction, we infer the deal-specific risk premium implied by its price, given its expected cash flows and the prevailing risk-free curve. Second, we explain those premia with a multi-factor model based on observable firm characteristics, with the price of each factor updated sequentially through Bayesian (Kalman) filtering as new transactions arrive; quarterly factor prices are the average implied price across transactions in each quarter. Third, we apply the estimated factor prices to value any asset – discounting its projected dividends at the appropriate risk-free curve plus its estimated premium – and track how its fair value evolves quarter by quarter.

Consistent with established asset-pricing theory and prior research (Bessembinder, Cooper and Zhang, 2019; Bartram and Grinblatt, 2018; Blanc-Brude and Tran, 2019), the systematic factors that explain transaction-implied premia are leverage (senior liabilities to total assets), size (total assets), profitability (return on assets before tax), investment intensity (capex to total assets), and country risk (the term spread), alongside controls for TICCS business model and corporate structure. Leverage affects equity risk under Modigliani–Miller; size, profitability, and investment are well-documented risk factors; and country risk captures macroeconomic exposure. Because the framework relies on principal markets, contemporaneous inputs, and calibration to observed transactions, it is consistent with the fair-value principles of IFRS 13. The pay-off is decomposition: every change in value can be split into revisions to expected cash flows, movements in risk-free interest rates, and shifts in the infrastructure risk premium.

Does the model hold up?

It does. For the 250-plus transactions where a real secondary-market price can be observed, the model's predicted valuations track the actual ones closely: predicted versus reported deal IRRs line up with an R^2 of 0.97, and the prediction error is typically within 5% of observed prices. Predicted EV/EBITDA, price-to-book, and price-to-sales ratios show similarly close agreement with reported values. The framework reproduces real prices well enough to trust the volatility estimates it produces.

WHAT THE MARKET REVEALS

Measured against real transactions rather than appraisals, the true total-return volatility of unlisted infrastructure equity typically runs between 7% and 12% – several times the figure that smoothed valuations imply. For contracted projects in advanced economies, the contrast is stark: where appraisal data suggest near-riskless behavior and Sharpe ratios above three, market-consistent estimates imply materially higher risk and far more plausible risk-adjusted performance; see Table 1.

The same dispersion appears across the asset class. Volatility, value-at-risk, and drawdowns behave as economic intuition would predict: contracted and Core infrastructure are calmer than merchant or growth-oriented segments, and the difference between the lowest and highest 99.5% value-at-risk approaches 2,500 basis points across segments. The positive relationship between expected return and risk holds throughout.

Discount rates, not just dividends

A common assumption is that infrastructure risk is mostly about whether the cash flows arrive. In fact, movements in discount rates – driven by both interest rates and the time-varying risk premium – contribute at least as much to volatility as revisions to expected dividends. Decomposing the change in value over one, three, and five years makes the point concrete. Since early 2016, dividend revisions added only a modest amount to aggregate NAV (around 2%), with Covid-related cuts concentrated in merchant assets and airports. Falling interest rates, by contrast, added roughly 9–10% over five years – frequently offset by rising premia in the more cyclical segments; see Table 2.

Because infrastructure cash flows stretch over decades, the asset class carries substantial duration risk, much like a long-dated bond. Ignoring the discount-rate channel therefore understates risk and leads to systematic mispricing – which is precisely what appraisal-based measures do.

A decade of repricing

Much of the volatility recorded over the past fifteen years reflects a one-off event rather than a permanent feature. Between roughly 2009 and 2016, strong institutional demand for yield and diversification compressed risk premia, and average discount rates fell from 12–14% in the early 2000s to 6–8% by 2016. This structural repricing generated large capital gains and accounts for a substantial share of realized volatility. Risk premia also rose during periods of stress – the 2008 financial crisis, the 2012 European debt crisis, and the Covid-19 pandemic – reflecting both changes in the price of risk and shifts in factor exposures.

Since 2016, expected returns have stabilized at lower levels, with movements driven more by interest-rate fluctuations than by further yield compression; the rise in rates in early 2021, for instance, produced negative returns across most segments. The implication for forecasting is important. Five-year volatility is on average about 20% lower than ten-year volatility, reflecting the end of the repricing cycle. Backward-looking volatility of 10–15% therefore overstates the future, while the post-2016 regime points to roughly 8–12% going forward – 7.6% to 11.6% across TICCS segments as of Q1 2021.

TABLE 1

Appraisal-based versus market-consistent risk and return, contracted projects in advanced economies, data to end-2020
Source: Scientific Infra & Private Assets.

Metric (10-year)	Appraisal-Based	Market-Consistent
Return volatility	~1.8%	~11.5%
Total return	~8.0%	~15.3%
Implied Sharpe ratio	~3.8	~1.2

TABLE 2

Cumulative five-year impact on market NAV of changes in dividend forecasts, the term structure of rates, and risk premia, selected segments, as of Q1 2021
Source: Scientific Infra & Private Assets.

Segment (5-year Change)	Dividends	Term Structure	Risk Premia
Global infrastructure	+2.1%	+9.9%	−9.4%
Contracted	+3.6%	+9.9%	−7.0%
Merchant	−2.2%	+8.5%	−13.2%
Airports	+12.4%	+13.8%	−27.2%

What drives the premium

The return investors demand is shaped by a handful of systematic factors whose prices have evolved over time. Leverage is the single largest driver, though its premium has more than halved since 2010 – a major contributor to the overall compression in yields; moving from low to medium leverage sharply increases required returns, but the effect flattens at very high leverage, consistent with highly geared contracted projects being relatively low-risk.

Size carries a positive premium, interpretable as a relative liquidity premium, that rises during periods of stress before easing after 2017. Profitability enters with a negative sign – more profitable firms are less risky – peaking around 2012 amid heightened risk aversion before reverting toward pre-2008 levels. Investment intensity, characteristic of greenfield development risk, commands a higher premium that has declined over time for the most exposed assets. And merchant exposure is priced above contracted or regulated assets, trending down over time but spiking during crises such as 2008 and 2020. Time variation in these premia is itself a major source of valuation volatility: as the asset class matured, pricing evolved through a process of yield compression and risk repricing consistent with broader capital-market dynamics.

A NATURAL EXPERIMENT: LISTED MEETS UNLISTED

To test these private-market estimates against an independent benchmark, we use a rare natural experiment. While listed proxies for unlisted infrastructure generally do not exist, there is one exception: contracted social-infrastructure (PPP) and renewable-energy projects in the United Kingdom. Fourteen funds listed on the London Stock Exchange do nothing but hold the unlisted equity of such projects. With little or no leverage, a single well-defined activity, and a tightly

confined geography, they are effectively a listed basket of unlisted assets.

At the end of 2020 these funds represented around GBP 18.5bn of market value, a reported appraisal value of GBP 16.5bn, and stakes in more than 800 individual unlisted projects – no single fund or theme dominating the sample. Because they are listed, they disclose their chosen discount rates, portfolio valuations, and the sensitivity of NAVs to discount-rate changes, and their market prices, returns, and volatility can be observed directly. Combining their market prices with reported appraisal NAVs – via a simple dividend-growth relationship – yields a market-implied discount rate for each fund. Since 2010 these funds have traded at persistent premiums to NAV of roughly 5–15%, implying market-implied discount rates that fell from about 8–9% in 2010 to 6–7% by 2020.

Comparing these market-implied rates with appraisal rates and with a matched private-market portfolio – built to the same TICCS and geographic weights, comprising 141 wholly-owned assets worth around GBP 16bn in 2020 – produces a clear result. The private and public market-implied measures converge over the decade and become statistically indistinguishable from 2018 onward. Appraisal discount rates, by contrast, remain stubbornly 60–90 basis points too high throughout; see Table 3.

Two comparable sets of investments exposed to the same risk factors – one listed, one unlisted – thus arrive at the same expected returns after 2018, following a decade of convergence. For these comparable UK assets, the public and private markets price the same underlying risk closely – nearly identically from 2018 onward; the appraisals are the outlier, confirming that they are not market-tested. This provides a strong, independent check on the risk-factor model and on the documented decline and stabilization of the infrastructure risk premium.

WHY IT MATTERS

A realistic volatility estimate is not a technical refinement; it changes the decisions institutions make. A total-return volatility of 7–12%, rather than the low single digits implied by appraisal NAVs, reshapes the role of infrastructure across the institutional landscape.

Asset allocation

Optimal portfolio weights are highly sensitive to the volatility input and to correlations with other risk assets. A higher and more accurate volatility estimate reduces the optimal weight to infrastructure relative to what smoothed appraisal data would suggest, and raises the asset class's measured contribution to total portfolio risk. The apparent diversification benefit of a near-flat return series is, to a large extent, an artifact of smoothing rather than a genuine reduction in risk.

Liability-driven investors

For investors matching long-dated liabilities, valuing infrastructure at market-consistent rather than smoothed appraisal rates is equally consequential. The same movements in risk-free rates that drive the present value of long-dated liabilities also drive infrastructure valuations through the duration channel. A market-consistent approach therefore reveals a hedging relationship that appraisal smoothing conceals, and recognizing the duration of infrastructure equity becomes essential to an accurate assessment of the asset–liability position.

Insurers and regulatory capital

Under solvency frameworks such as Solvency II, the capital an insurer must hold against an asset is driven by its modeled volatility and stress sensitivity. Appraisal-based volatility, by understating true risk, would understate the capital required against infrastructure equity. The market-consistent estimates reported here imply a more conservative and economically appropriate capital charge – and a more honest picture of solvency under stress.

Performance benchmarking

Finally, plausible risk-adjusted return measurement depends on plausible risk. Sharpe ratios above three are not a sign of exceptional skill but of mismeasured volatility. Market-consistent estimates bring reported risk-adjusted performance back into a believable range, supporting fairer assessment of managers and more meaningful comparison across asset classes.

RELATION TO THE EXISTING EVIDENCE

These results connect three strands of the literature on illiquid-asset valuation. The real-estate work on appraisal smoothing (Geltner, 1991) and the broader work on return smoothing in illiquid portfolios (Getmansky, Lo and Makarov, 2004) established that appraisal-based series understate true volatility through serial correlation and delayed adjustment; we extend that insight to unlisted infrastructure and, rather than only diagnosing or statistically un-smoothing reported returns, recover volatility directly from transaction-implied discount rates. The private-equity valuation literature (Kaplan and Schoar, 2005) showed that reported private-market performance is sensitive to valuation conventions and the timing of cash flows; our framework addresses this by calibrating to observed secondary-market transactions rather than reported NAVs. The distinctive contribution is to combine direct market-implied estimation with a full decomposition of valuation changes into cash-flow, interest-rate, and risk-premium components, and to validate the result against listed proxies – to our knowledge the first study to do all three for this asset class.

TABLE 3

Average market-implied, appraisal, and private-market discount rates for listed UK PPP and renewable-energy funds, with gaps versus market-implied rates
Source: Annual Reports, Datastream, Scientific Infra & Private Assets.

Period	Market-Implied	Appraisal (Gap)	Private Market (Gap)
2010–2014	8.28%	9.11% (+83 bp)	9.91% (+163 bp)
2015–2018	7.26%	7.88% (+62 bp)	7.00% (−25 bp)
2019–2020	6.70%	7.61% (+91 bp)	6.80% (+10 bp)

THE BOTTOM LINE

Unlisted infrastructure remains a sound long-term investment, but it is not the near-riskless asset its smoothed valuations make it appear. Measured against real transactions, its risk is several times higher; it behaves partly like a long-duration bond; and much of its strong recent performance reflects a one-time repricing that will not repeat. Pricing it on market-consistent terms – and accepting the volatility that comes with honest marks – gives investors and regulators a sounder basis for allocation, hedging, capital, and benchmarking decisions. The convergence of listed and unlisted pricing since 2018 confirms the picture is right. The remaining barrier is not data or method, but the willingness to treat a realistic view of risk as a mark of discipline rather than a concession.

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Private Asset Valuation: A Regulatory Summary[1] a Condensed Comparison of Seven Regulatory Regimes

Demi Chung
Senior Researcher and Head of Accounting Standards & Financial Reporting Doctrine and Practices
EDHEC Infrastructure & Private Assets Research Institute

Timothy Whittaker
Director
EDHEC Infrastructure & Private Assets Research Institute

- Across major regulatory regimes, valuation is finally beginning to be treated as a governance and accountability issue, not merely a technical or back-office function.
- Supervisory scrutiny concentrates on open-ended and semi-liquid funds, continuation vehicles, retail wrappers, and superannuation arrangements, where stale valuations directly affect investor fairness.
- IOSCO, the FCA, Luxembourg's CSSF, and Australia's APRA/ASIC set out the most detailed operational expectations; the US, though lacking a current rule, remains actively engaged.
- Common expectations include named accountability, functional independence, trigger-based revaluation, model validation, and a tested pathway from pricing error to investor remediation.

VALUATION HAS BECOME A GOVERNANCE ISSUE

For much of the industry's history, valuing a stake in an unlisted fund, a private credit loan or an infrastructure asset was treated as a technical, back-office task: apply a model consistently, and move on. That framing is no longer sufficient. Across seven major regulatory regimes, the recurring message from consultations, supervisory reviews and enforcement actions is consistent: valuation is increasingly treated as a matter of accountability, independence and investor fairness, rather than a narrow question of model selection.

This shift has developed gradually across a number of parallel workstreams: an IOSCO consultation updating its global valuation principles, a detailed FCA supervisory review, a vacated but still-relevant SEC rulemaking, an EU framework under closer supervisory application, a Luxembourg regime that has hardened tolerance thresholds into binding circulars, a still-developing Singapore retail-access framework, and an Australian model combining prudential and conduct oversight. The seven regimes differ in legal form and enforcement posture, but converge on a shared concern: that imperfect valuations can shift value between investors who never agreed to that outcome.

THE STRUCTURES UNDER CLOSEST SCRUTINY

Supervisory attention is not evenly distributed across private asset structures. It concentrates where an imperfect valuation can directly affect who pays or receives value on a live basis: open-ended and semi-liquid funds, where a stale price affects the fairness of subscriptions and redemptions; continuation funds and adviser-led transactions, where the same valuation determines what departing and rolling investors each receive; and retail or private-wealth wrappers, where broader distribution raises the bar on disclosure and suitability. Superannuation and pension arrangements complete the list – stale valuations there can quietly redistribute value between member cohorts rather than simply mispricing a single transaction; see Table 1.

TABLE 1

The product structures currently drawing the sharpest supervisory attention
Source: EDHEC analysis of public regulatory materials, Q1 2026.

Structure	Why it Draws Scrutiny
Open-ended/semi-liquid private asset funds	Valuation directly sets who subscribes or redeems at what price.
Continuation funds & adviser-led deals	The same number decides what selling and rolling investors each get.
Retail/private-wealth wrappers	Wider distribution raises the bar on disclosure and suitability.
Superannuation/pension arrangements	Stale values can redistribute wealth unfairly between member cohorts.

THE MOST OPERATIONALLY PRESCRIPTIVE REGULATORS

Of the seven regimes reviewed, four stand out for translating principle into detailed operational expectations, while the US is also worth noting.

IOSCO: Setting the likely global baseline

IOSCO does not issue binding law, but its November 2025 consultation replacing the 2007 and 2013 valuation principles is likely to shape the reference points other regulators use. Two proposals stand out: valuations for open-ended funds should stay current on dealing days, supported by explicit quantitative and qualitative thresholds against stale pricing; and where a pricing error causes material harm, the expectation is prompt correction together with full investor compensation.

FCA: Detailed supervisory expectations

The UK regulator's March 2025 review of private markets valuation practices sets out, in some detail, what examiners expect firms to evidence: named accountability for valuation decisions, valuation committees with genuine authority to challenge portfolio teams rather than simply ratify their proposals, conflicts mapped to specific commercial triggers such as fees and redemptions, and – a notable finding – that many firms had not defined clear triggers for an out-of-cycle valuation. The FCA's March 2026 priorities confirm this remains an ongoing supervisory target.

CSSF: The most specific operational requirements

Luxembourg's requirements are currently the most detailed of the regimes reviewed. Circular 24/856 does not permit firms to default to a generic 5% NAV error tolerance; thresholds must instead rest on documented, asset-specific analysis, linked directly to correction, investor indemnification and remediation planning. The CSSF's 2026 supervisory priorities add on-site inspections of valuation governance and thematic reviews of open-ended private asset funds, including continuation vehicles, and frame the topic as a financial-stability question as well as a conduct one.

[1] *This report is condensed from EDHEC Infrastructure & Private Assets Research Institute, "Private Asset Valuation: Comparative Regulatory Briefing" (May 2026), which reviews public materials from IOSCO, the FCA, the SEC, ESMA, the CSSF, MAS and APRA/ASIC through March 31, 2026. This summary is intended to support internal prioritization and is not a substitute for jurisdiction-specific legal advice.*

APRA and ASIC: Complementary prudential and conduct oversight

Australia operates a two-regulator model. APRA's Prudential Standard SPS 530 requires superannuation boards to maintain an adequate valuation governance framework, and its December 2024 thematic review[2] found that 12 of 23 licensees reviewed required material improvement in governance, revaluation triggers, or both. ASIC addresses the conduct dimension: its private credit reports[3] identified valuation practices, alongside fees and related-party governance, as areas requiring improvement, and it has used stop-order powers where transparency and valuation practices fell short of expectations.

THE US: FEWER FORMAL RULES, COMPARABLE SCRUTINY

The US is the one regime among those reviewed without an operative new valuation rule. The 2023 private fund adviser reforms – which would have required a fairness or valuation opinion for adviser-led secondaries – were vacated by the Fifth Circuit in June 2024. However, the SEC's March 2026 roundtable on private markets valuation, convened as retail access to private markets accelerates, indicates that the Commission continues to treat the topic as a live concern. Existing fiduciary, anti-fraud and disclosure obligations remain applicable to valuation-related conduct, particularly in adviser-led transactions or vehicles that broaden retail exposure to private assets. The absence of a new prescriptive rule should not be read as reduced supervisory interest.

COMMON EXPECTATIONS ACROSS REGIMES

Despite differences in legal form and enforcement approach, five expectations recur consistently across the jurisdictions reviewed (see Table 2).

TABLE 2

Convergent control expectations across IOSCO, FCA, SEC, ESMA, CSSF, MAS and APRA/ASIC
Source: EDHEC analysis of public regulatory materials through March 31, 2026.

Expectation	What Regulators are Asking for
Named accountability	An identifiable owner of each valuation decision, supported by more than committee minutes.
Functional independence	Valuation challenge that portfolio teams cannot dominate or simply ratify.
Trigger-based revaluation	Defined quantitative and qualitative events that prompt an interim valuation, rather than reliance on the next scheduled review.
Model validation	Documented, repeatable methodology review, including where a third-party valuer is used.
Error and remediation pathway	A tested route from detecting a pricing error to correcting it and, where appropriate, compensating investors.

CONSIDERATIONS FOR FIRMS

Awaiting final rules is unlikely to be a sufficient response in any of the seven regimes reviewed; even Singapore's consultation-stage Long-Term Investment Fund framework and the SEC's currently-vacated rule package are accompanied by active supervisory attention. A number of practical steps are broadly applicable across jurisdictions:

- **Prioritize by product structure:** identify which products sit in the highest-risk category – open-ended, semi-liquid, continuation, or retail-facing structures – and prioritize those first.
- **Review current policy:** test existing valuation policies against the IOSCO consultation and the FCA review, both of which function as detailed gap-analysis references.
- **Formalize revaluation triggers:** document the quantitative and qualitative triggers for an out-of-cycle valuation, rather than relying on scheduled review points alone.
- **Document conflicts specifically:** map conflicts individually wherever a valuation affects fees, subscriptions, redemptions or continuation pricing (the valuation used to determine what selling and rolling investors each receive in a continuation fund transaction) rather than relying on a general conflicts policy.
- **Prepare an error-remediation process:** establish and test the pathway from error detection through escalation, investor notification and compensation.

OUTLOOK

None of the seven regimes is proposing a single global valuation model, nor is this likely to emerge. What they share is reduced tolerance for valuation frameworks that appear complete on paper but cannot demonstrate independence, cannot demonstrate that a revaluation trigger has been applied, and cannot show a clear path from a pricing error to its resolution. IOSCO's consultation is likely to serve as a reference point against which other supervisors calibrate their own expectations through 2026 and beyond; firms able to address its questions are likely to find engagement with other regulators more straightforward.

[2] Governance of Unlisted Asset Valuation and Liquidity Risk Management in Superannuation: https://www.apra.gov.au/governance-of-unlisted-asset-valuation-and-liquidity-risk-management-superannuation-december-2024.
[3] REP 814 – Private Credit in Australia (September 2025): https://download.asic.gov.au/media/z2tnnasb/rep814-published-22-september-2025.pdf.
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The Exit Test: What a Decade of Realizations Reveals About Valuation Accuracy

Evan Clark
Senior Private Markets Analyst
EDHEC Infrastructure & Private Assets Research Institute

- Valuation of private assets systematically understate exit prices across both private equity and infrastructure.
- Exit uplifts have fallen since 2022 relative to the 2015–2021 period. Median private equity exit uplifts fell from 23% to 17.6%.
- Exit uplifts decline as hold period increases, from a median of 48% for assets exited under three years, to near zero for exits held for seven+ years.
- Valuation findings have implications for DC pension plans and Evergreen funds where value transfers occur if assets are mispriced.

EXECUTIVE SUMMARY

This paper explores the accuracy of private asset valuations by examining realized private equity and infrastructure equity exits across UK listed investment trusts. We developed a dataset of 333 individual exit transactions across 29 investment trusts[4] spanning 2015 to 2026, relying on financial reporting and regulatory filings of the investment trusts. By comparing each exit price against the last published (and unaffected) carrying value before announced deal exit, we obtain a measure of valuation accuracy, the uplift or discount at which private assets are ultimately realized relative to their most recently reported carrying value. Key findings include:

- **Valuations systematically understate exit prices across both PE and infrastructure.** Across 333 exits, the mean and median exit price exceeded the prior carrying value by 32% and 19%, respectively. For private equity, the median uplift was 20% across 282 transactions. For private infrastructure, we find a comparable median uplift of approximately 23%.[5] Almost 80% of all exits were completed above the last reported carrying value, and the finding is consistent across investment trusts, time, and buyer types (financial, strategic).
- **Fair Value Standard.** Under IFRS 13 and FRS 102, valuations of private assets should reflect an exit price as of the measurement date, not a conservative estimate. Persistent uplifts of 20%+ over time and manager are not consistent with fair value principles. Notably, exits to financial buyers achieve similar exit uplifts as exits to strategic acquirers, undermining an industry explanation that uplifts arise from identifying the right buyer.
- **Market Valuations and Post 2022 Results.** Exit uplifts have fallen since 2022 relative to the 2015–2022 period. Median private equity exit uplifts fell from 23% to 17.6%. Moreover, exit proceeds relative to starting NAVs are much lower (10–15%) than in the prior period (25–50%). The inflation and interest rate shock of 2022 led to material widening of discounts to NAV. Infrastructure investment trusts had traded at a premium through 2021, and now trade at meaningful discounts (10–20%). For private equity, the discounts widened to 25–40% and have remained wide through Q1 2026.
- **Investment Hold period and Exit Uplifts**. Exit uplifts decline as hold period increases, from a median of 48% for assets held under three years to near zero for assets held for 7+ years. The current environment is more impacted by longer hold periods, which partly explains the compression in recent uplifts. The assets acquired in 2020–2022 now face a lower-multiple exit market, potentially posing the risk of discounts at exit.
- **Implications beyond listed trusts**. The valuation practices documented here reflect those of a large number of underlying private equity and infrastructure managers globally. For defined contribution pension schemes and evergreen funds that must strike frequent NAVs, systematic mispricing transfers value between participants who transact and those who do not. This is a fiduciary concern and an increasingly pressing regulatory issue as private market access is extended to DC plans.

INTRODUCTION

Listed investment trusts[6] are closed-ended vehicles quoted on the London Stock Exchange that hold private assets on behalf of institutional and retail shareholders; unlike open-ended funds, investors buy and sell shares in the secondary market rather than subscribing and redeeming directly with the vehicle. These trusts and investment companies provide a window into valuation practices at alternative asset management firms. These vehicles hold private assets either directly through investments in private companies, or indirectly by committing to limited partnerships that hold investments in private companies. As such, they report net asset values (NAVs) to investors monthly and trade in listed secondary markets continuously. The reported net asset values should reflect the fair values of the underlying assets held in each trust, in accordance with FRS 102 or IFRS 13. That is to say, the valuations should reflect an 'exit' price at the measurement date. If following fair value guidelines, we would expect to find no systematic under or overvaluing of assets, but rather, random noise around the exit prices.

Though the investment trusts are a small part of the private asset market, they do provide a view on how large private asset funds value assets. Several of the investment trusts invest across many of the top private equity managers globally, thus the valuations of their assets reflect the practices of a large number of the leading private asset managers. Therefore, the findings here are indicative of the practices in the broader private assets market.

The paper aims to provide the quantitative exit data to assess whether fair value accounting principles are being applied by private asset funds and managers. With the growth of defined contribution pensions and monthly or even daily dealing private asset funds, failure to price assets at fair value can lead to value transfers between participants. When investors enter or exit a vehicle at a NAV that does not reflect the true value of underlying assets, wealth is transferred among investors, a fiduciary concern that becomes more acute as private market access is extended to DC pension schemes and retail investors. The distributional consequences of the valuation patterns documented here are discussed in the paper.

DATA AND METHODOLOGY

We constructed a dataset of 333 individual exit transactions from 29 UK listed investment trusts and companies, spanning 2015 to early 2026. For each transaction, we match the exit proceeds against the last published carrying value before completion to derive a transaction-level uplift or discount. The dataset spans private equity (282 transactions) and infrastructure (51 transactions), providing coverage of the major asset classes held by UK listed private capital vehicles.

The uplift is calculated as follows:

METHODOLOGY

Uplift (%) = (Exit Proceeds – Recent Unaffected Carrying Value) ÷ Carrying Value

Prior carrying value is defined as the fair value disclosed in the most recently published annual report, interim report, or monthly NAV statement before the date of exit completion, provided that value is free of any deal or transaction information. Where the most recent valuation appears to have been influenced by a known or pending transaction – for example, if a company sold on March 15, 2026 had its December 2025 carrying value written up in anticipation of the deal[7] – we look

[4] Reviewed 47 UK listed investment trusts with 29 having sufficient data to extract deal data.
[5] Infrastructure medians are NAV weighted.
[6] Most UK listed vehicles in this dataset are structured as investment trusts, closed-ended vehicles designated as such by HMRC, while others, such as 3i Group and Oakley Capital Investments, are listed investment companies incorporated under general company law rather than the investment trust regime.
[7] This requires case by case judgment but deal information is normally disclosed in the interim, annual reports, or factsheets, particularly if it led to a change in carrying value of an asset(s).

back to the nearest prior valuation unaffected by deal news. This approach is consistent with how managers themselves typically characterize exit uplifts in their own disclosures.

Certain investment trusts did not provide the deal-level disclosures required to map exit proceeds to prior carrying values. In these instances, we rely on the managers' reported weighted average uplifts disclosed in their annual reports. These results are reported alongside the deal-level findings and largely corroborate them.

FAIR VALUE: THE STANDARD BEING APPLIED

The investment trusts and companies in this dataset are required to carry private asset investments at fair value under either IFRS 13 or FRS 102, depending on domicile. Under both standards, fair value is defined as the price that would be received to sell an asset in an orderly transaction between market participants at the measurement date. It is not principally a conservative estimate, and does not represent a floor valuation. A valuation that is intentionally or systematically above or below exit price is not a fair value.

RESULTS: SYSTEMATIC LARGE UPLIFT TO NAV ON EXIT

Table 1 details the mean and median uplift for all transactions for the period 2015 to 2026, split between private equity and infrastructure exits.

Across all 333 deals, the mean and median exit uplifts were 32% and 19% respectively. Approximately 78% of all deals had a positive uplift and close to 50% had uplifts greater than 20%. Just 14% of exits took place at values lower than the most recent undisturbed carrying value. For private equity, the mean and median exit uplifts were 36% and 20% respectively. For infrastructure, the equivalent figures on a NAV-weighted basis were 23.5% and 23%.

We repeat the same analysis splitting the dataset into deals exited up to and including 2022 (Table 2), and those completed thereafter (Table 3), to account for the significant rise in interest rates that began in 2022. For private equity, the median exit uplift fell from 23% in the earlier period to 17.6% post-2022, a compression that is statistically significant at the 5% level (Mann-Whitney p = 0.017) but has not eliminated the positive bias, which remains highly significant at the 1% level in both periods. For infrastructure, 44 of the 51 deals in the dataset were completed post-2022, with the mean and median exit uplifts for this cohort 16% and 15% respectively on a NAV-weighted basis. Despite this compression, the infrastructure median remains significantly above zero at the 1% level (Wilcoxon p = 0.0001). Given that the infrastructure sample is more heavily concentrated in a single market environment than the PE findings, these results should be read as corroborative of the broader valuation accuracy finding rather than as an independently conclusive sub-sample, but the direction is consistent and the significance is there.

The distribution of outcomes is strongly right-skewed, which is inconsistent with random valuation error around a fair value estimate. Around half of all exits achieved uplifts exceeding 20% while just 14% recorded any discount to carrying value, producing an asymmetric distribution that would not be expected if carrying values were unbiased estimates of exit price. Under fair value principles, errors should be random and centered around zero.

Figure 1 adds granularity by showing the median exit uplift by year across all deals. The results are similar whether using all deals or just private equity deals. Persistent positive uplifts can be seen in all years, with positive but lower median uplifts post 2022.

TABLE 1

Exit uplifts for all deals 2015–2026
Source: Financial Reports, Factsheets, RNS. Calculations by EIPA. All median values statistically different from zero at 1% level (Wilcoxon p < 0.0001).

2015–2026 (Full Period)	All Deals	Private Equity Deals	Infrastructure Deals
Number of exits	333	282	51
Mean uplift	32.0%	35.5%	23.5%
Median uplift	18.8%	20.2%	22.9%
% exits with positive uplift	78.0%	80.1%	66.7%
% exits with uplifts > 20%	48.0%	50.4%	35.3%
% exits at discount	14.1%	15.2%	7.8%

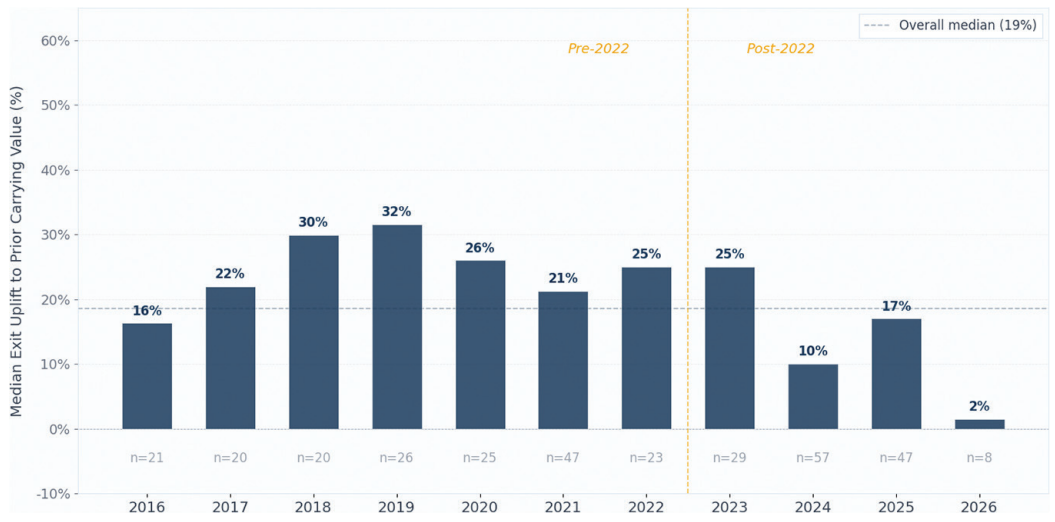
TABLE 2

Exit uplifts for all deals 2015–2022
Source: Financial Reports, Factsheets, RNS. Calculations by EIPA.

2015–2022	All Deals	Private Equity Deals	Infrastructure Deals
Number of exits	192	185	7
Mean uplift	37.6%	37.6%	36.8%
Median uplift	23.9%	23.2%	37.2%
% exits with positive uplift	83.3%	83.2%	85.7%
% exits with uplifts > 20%	54.7%	53.5%	85.7%
% exits at discount	13.5%	13.5%	14.3%

FIGURE 1

Median exit uplifts for PE and infrastructure by year
Source: Financial Reports, Factsheets, RNS. Calculations by EIPA.



HOLD PERIOD AND PE VALUATION UPLIFTS

Another dimension of the dataset is the relationship between investment hold period and exit uplift. This is particularly relevant in the current period given the lengthening hold periods and more tepid exit environment.

Across 282 private equity exits, we find a statistically significant[8] negative relationship between the length of the holding period and the uplift achieved at exit. The pattern across holding period buckets is consistent. Table 4 details the uplift data by hold period:

[8] Spearman r = –0.31, p < 0.0001. This relationship is robust to the exclusion of IPO exits (r = –0.31, p < 0.0001), holds in both pre-2022 (r = –0.25, p = 0.001) and post-2022 periods (r = –0.34, p = 0.0002).

TABLE 3

Exit uplifts for all deals 2023–2026
Source: Financial Reports, Factsheets, RNS. Calculations by EIPA. Median for PE deals lower than prior Period (2015–2022) at 5% significance level (Mann-Whitney p = 0.017).

2023–2026	All Deals	Private Equity Deals	Infrastructure Deals
Number of exits	141	97	44
Mean uplift	24.4%	31.4%	16.4%
Median uplift	13.6%	17.6%	15.3%
% exits with positive uplift	70.9%	74.2%	63.6%
% exits with uplifts > 20%	39.0%	44.3%	27.3%
% exits at discount	14.9%	18.6%	6.8%

TABLE 4

Private equity exit uplifts by hold period
Notes: *<0.1, **<0.05, ***<0.01; Represents significance between buckets. Only transition 7–10 yrs to 10+ yrs fails to show significance. Significance for first four buckets.

Hold Period	Count	Mean Uplift	Median Uplift	% Positive	% Negative
0–3 years*	56	67.6%	48.0%	83%	16%
3–5 years*	94	41.1%	28.9%	86%	8%
5–7 years***	66	26.9%	20.1%	80%	17%
7–10 years	42	8.7%	6.1%	73%	22%
10+ years	24	8.7%	2.8%	63%	29%

TABLE 5

Private equity hold periods by exit year
Source: Financial Reports. Calculations by EIPA.

Exit Year	Count	Mean Hold (Years)	Median Hold (Years)	% Short (≤3 Years)	% Long (≥7 Years)
2019	23	5.45	4.34	22%	30%
2020	25	4.98	4.17	20%	8%
2021	46	4.31	3.71	40%	13%
2022	23	4.98	3.92	35%	26%
2023	20	5.14	4.84	20%	20%
2024	41	5.89	5.84	7%	22%
2025	32	6.70	5.71	6%	28%

The difference in uplifts by hold period further calls into question the valuation practices among private asset managers. While it is possible that better assets are exited earlier in the hold period, this should be reflected in the carrying value of the assets prior to exit. If fair value accounting was followed, we should not observe clear differences in valuation errors by hold period.

Discounted exits tell a complementary story. Assets that exit below carrying value have a longer mean hold period (6.6 years) than those exiting above carrying value (5.2 years), a difference that is statistically significant (p = 0.012). Very long holds are disproportionately associated with assets selling at a discount, with the 10+ year bucket showing 29% of exits occurring at a discount to carrying value compared to 8–16% for short holds.

THE 2021 EXIT BOOM AND THE SUBSEQUENT EXIT DROUGHT

Examining hold periods by exit year (Table 5) provides some additional context on the change in exit uplift for years after 2022.

The 2021 exit cohort was the shortest-held in the dataset – median 3.71 years, with 40% of exits completed within three years of investment. This was a robust exit market, when a wave of 2018–2020 vintage investments were listed or otherwise exited within a compressed timeframe. A few extreme exit uplifts drove the results with mean (median) uplifts of 51% (21%) for the year.

By 2024 and 2025, the environment had changed. These exit years are the longest held exit cohorts in the dataset with median hold periods of 5.84 and 5.71 years respectively, and virtually no short hold exits (7% and 6% of exits held three years or less). The exit market cooling following the inflation shock meant that assets that would ordinarily have been sold at years four to five of their hold were retained for an extended period. The lower median uplifts observed in 2024 (10%) and in recent 2025 data are a sign of a tougher M&A environment and revalued NAVs combined with lower exit prices.

IMPLICATIONS FOR DC PENSION PLANS AND BEYOND

The implications are most acute in the context of defined contribution pension plans that offer daily or frequent dealing to their members. DC schemes are the dominant retirement savings vehicle across major markets – in the UK, Australia, the United States, Netherlands, and increasingly across continental Europe. The shift from defined benefit to defined contribution is expected to continue, and with increasing exposure to private assets, valuation concerns are paramount.

The same logic applies to evergreen private market funds, which are closed-ended funds that offer monthly subscriptions and quarterly redemptions at NAV. These structures have grown rapidly in recent years as asset managers have sought to bring private market exposure to a broader retail and wealth management market. In fact, some of the players analyzed in this paper (Pantheon, HarbourVest, NB Private Equity, HgCapital and Partners Group) have private equity evergreen products that are very similar in asset mix to their UK listed investment trust. In the listed investment trust market, they trade at 25–40% discounts to NAV, whereas in the Evergreen fund market, they issue and redeem at the latest NAV. As noted earlier, the NAVs typically come from the investment managers themselves so they should be consistent across the various vehicles of each manager, closed-end, open-ended, listed trust, and so on.

Across 333 exits and 29 listed vehicles spanning a decade, private asset carrying values have systematically understated realized exit prices by a median of 20% for private equity and approximately 23% for infrastructure. It is directionally consistent across market conditions, exit routes, and the full span of years covered by the dataset.

The stakes are highest where NAVs are used to facilitate frequent member transactions. In defined contribution pension schemes and open-ended private asset funds, participants who enter or exit at a NAV that does not reflect true asset value transfer wealth to or from those who remain. As regulators extend private market access to retail and DC investors, the demand for valuation standards that genuinely reflect exit prices at the measurement date will only grow. At a minimum, back-testing of carrying values against realized exits, the very approach applied in this paper, should become a standard component of valuation governance for any private asset vehicle offering frequent liquidity. This paper provides a quantitative foundation for that conversation.

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