The Valuation of Private Assets: New Methods

Professor Stijn Van Nieuwerburgh (Columbia University)

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Unlike public markets with real-time pricing, private markets are opaque, with price discovery shaped by idiosyncratic factors like the entities involved.

Notably, the number of U.S. public companies has halved since 1997, while private assets under management have doubled to $13 trillion by 2023—and are projected to double again within 6-7 years.

This surge in private market AUM was the key motivation behind Columbia University Professor Stijn Van Nieuwerburgh's keynote speech at ABFER 12th Annual Conference.

Stijn started by noting that in recent years, large pension funds have allocated roughly 30% of their assets to private assets, often at the expense of allocations to public equities and fixed income.

He then outlined key differences between public and private assets. Private assets trade infrequently in opaque, illiquid markets—unlike public stocks, which are priced in real-time. This opacity raises challenges in valuation and enables "volatility laundering," where infrequent trading masks actual market shifts. Private assets are also lumpy—you can't buy part of a building like you can a single share.

Stijn underscored two types of heterogeneity in private markets: asset heterogeneity and investor heterogeneity.

Asset heterogeneity emphasizes the uniqueness of private assets—for instance, no two buildings are in the same location.

Investor heterogeneity, the central theme of his address, refers to the diverse ecosystem of buyers and sellers in private markets, which is even more complex than in public markets. His research aims to understand how much the value of private assets is influenced by the specific mix of investors active in the market at any given time.

To address that, Stijn emphasized the importance of using multi-factor models to evaluate private investments. Rather than depending on single-risk models like CAPM, a common practice, it is critical to account for multiple sources of risk—just as is done in public equity markets—to better understand performance. His research shows that average private funds lose value once multiple risks are factored in—buyouts (-6%), VC (-9%), and real estate PE (-16%). Still, around one-third of funds earn over 10% in risk-adjusted returns.

Stijn then turned to his latest paper—Commercial Real Estate Ecosystem—which moves away from relying on public markets to infer risk prices. As capital shifts to private markets and public listings decline, public markets may no longer reflect certain risks, which could become exclusive to private markets where specialized, under-diversified investors actively trade.

The paper specifically explores how investor heterogeneity in private markets affects asset pricing. Using a comprehensive dataset from Real Capital Analytics—covering 500,000 U.S. CRE transactions (~$10 trillion) and 300,000 investors—it incorporates detailed asset- and buyer-seller-level characteristics. The study highlights significant investor heterogeneity from sovereign wealth funds and REITs to small local developers and reveals deep market segmentations by investor size, geography, asset type, and quality.

To value properties in this world full of heterogeneity, Stijn starts with the traditional hedonic valuation model—where value depends on asset characteristics. He then extends this model by adding investor characteristics and time-fixed effects, recognizing that who is in the market also matters. He uses LightGBM, a machine learning method suited to large datasets, to capture these interactions between asset and investor characteristics as well as nonlinearities.

The benchmark hedonic model explains approximately 60% of price variation in apartments and 46% in offices. Interestingly, LightGBM, even without investor data, improves explanatory power (R-squared) by 15-20 percentage points. Once investor characteristics are incorporated into the model, R-squared increases to 90%, explaining up to 64% of the variation in valuations unexplained by the most sophisticated model without investor characteristics. Investor characteristics thus emerged as the most relevant determinant of property valuation.

Stijn highlighted that the most important interaction effect is between investor size and building size: valuations are higher when large investors buy large buildings, and small investors buy small ones; mismatches lower value.

He then introduced a transaction model to explain who trades with whom, based on a directed search framework where matches depend on investor characteristics. The probability that a buyer and seller transact with each other is the product of three probabilities: the probability that the seller lists, the probability that a particular buyer meets that building, and the probability that a transaction occurs after the meeting.

The key factor is meeting probability, which increases with buyer size, buyer-seller similarity, and how closely the asset matches the buyer's existing portfolio—reflecting investor specialization. A 1% increase in asset size or portfolio similarity raises meeting likelihood by ~10%. Overall, the model predicts buyer-building matches 250x better than random matching.

A key application of this new model is out-of-sample price prediction. In predicting 2023 building prices using only data through 2022, Stijn's combined valuation and transaction model outperformed the traditional hedonic model 70-90% of the time, reducing pricing errors by 20-30 percentage points. It also predicts likely buyers—accounting for investor-specific valuations—and generates a price distribution, with the model using the median as its predicted price.

Other applications include solving for the prices that would have prevailed had a particular group of investors been absent from the market. Stijn showed that absent foreign buyers in the Manhattan office market, the price would have been 7.5% lower in the 2013-2023 period.

The findings show that investor composition significantly impacts private asset values, opening a new research frontier.