

Controlling for Variable Liquidity and Selection Bias in Indices of Private Asset Market Values

Abstract

This paper develops the concept of a constant-liquidity value index for private asset markets and an econometric procedure for estimating such an index. We demonstrate this procedure on the NCREIF database of institutional commercial property. Private asset markets are distinguished from public securities exchanges in that unique, whole assets are individually traded in privately negotiated deals between one selling party and one buying party, and there is no institutional structure set up to maintain liquidity in the sense of ease of selling of the assets. Major private asset markets in the U.S. include commercial and residential real estate, collectibles, and private equity markets such as the venture capital market. Liquidity in such markets, as indicated by the volume (or rate) of asset sale transactions, or the rate of capital flow into the market, is notoriously variable over time. Indeed, a salient characteristic of private asset markets is that liquidity is high when the market is “up,” and low when the market is “down.” Therefore, indices of changes in market value over time that are based on asset transaction prices will systematically reflect variable liquidity. This renders “apples-to-apples” comparisons problematical, both in the comparison of asset values across time within the market (i.e., measurement of “capital returns”), and in the comparison of investment return volatility between the private asset market and other markets or asset classes--especially publicly-traded securitized investment asset classes where liquidity is constantly maintained by the stock exchange.

In this paper we present a model of dynamic equilibrium in a double-sided search market with a finite supply of heterogeneous assets and agents, the major characteristics of private asset markets. We show how such a model represents the type of pro-cyclical variable liquidity observed in private asset markets, and we define a conceptual construct which we call “constant liquidity value,” to reflect the prices that would hypothetically equilibrate such a market, holding the ease of selling constant across time within the market. We show the theoretical implications this model holds for the relationship between variable liquidity price changes and constant liquidity value changes across time in such a market. Depending on whether the liquidity cycle is coincident with the asset market cycle in levels or in changes, constant-liquidity values will either display greater cycle amplitude or a temporal lead compared to the variable liquidity prices. We then develop an econometric model that allows empirical quantification of the difference between observed price changes and constant-liquidity value changes for a population of assets with known characteristics of both the sold and unsold assets in each period. We also explore the effect of sample selection bias in transaction-based indices, and we correct for this type of bias in our suggested empirical procedure. Our application to the NCREIF database reveals that, in the case of institutional commercial real estate investment, constant liquidity values tend to lead variable-liquidity prices in time, and also to display greater volatility and cycle amplitude.