

# What's in a Loan Yield? The Construction of a Hedonic Index of Yields for Commercial Real Estate Mortgages

by

**Serguei Chervachidze<sup>1</sup>**  
CBRE Econometric Advisors

**Mark Gallagher**  
CBRE Global Research

**William Wheaton<sup>2</sup>**  
CBRE Econometric Advisors,  
Department of Economics  
Massachusetts Institute of Technology

*Version: December, 2014*  
*JEL Codes: E43, G12, G19, G21*

In this paper we investigate the utility of using a hedonic model to construct an index of yields on commercial mortgage loans. The use of a hedonic model represents an innovation in that this technique is never used in the creation of financial indexes. We utilize a large unique proprietary dataset of mortgage originations from CBRE Capital Markets from 2000Q3 – 2012Q4 to construct a hedonic model of yields as a function of loan characteristics as well as time effects.

We deal with the inherent endogeneity of LTV's as a loan characteristic by constructing an instrument variable that represents a lender's average LTV profile and estimating the hedonic via 2SLS. We find that the loan characteristics play a significant role in the pricing of the loan and have the expected signs. We also find that the instrumented LTV has a positive effect on yields, which we interpret as evidence that the loan hedonic specification traces out the supply curve of loans. Comparing the estimates of the hedonic using OLS and 2SLS approaches, we find the bias from OLS to be small for practical purposes of index construction. In terms of term structure of loan yields, we find that while the yield curve on commercial loans generally follows the shape of the yield curve on Treasury bonds up until the start of financial crisis in 2007, this relationship breaks down post-crisis, with the loan term structure having a negative slope for yields on short-term loans.

Next, we use the estimated model to construct an index of loan yields (thus controlling for variation in loan characteristics) and contrast it with a simplistic average of yields. Specifically, we utilize a battery of cointegration tests with various US debt yield indexes to test whether a hedonic index performs better in uncovering underlying equilibrium relationships with other yield variables than a simple average of yields. We find evidence that is strongly in favor of a hedonic index. We confirm the validity of our cointegration tests by building a VECM model between a hedonic index and a Bank of America Merrill Lynch Bond Yield index. Taken together, our findings offer strong evidence for the superiority of hedonic indexes over simplistic averaging techniques in both tracking the movement of mortgage yields over time, as well as in uncovering the underlying equilibrium relationships between mortgage yields and related economic variables.

---

<sup>1</sup> CBRE Econometric Advisors, 260 Franklin Street., Suite 400, Boston, MA 02110, Phone: (617) 912-5218, Fax: (617) 912-5240, [serguei.chervachidze@cbre.com](mailto:serguei.chervachidze@cbre.com)

<sup>2</sup> Department of Economics, MIT, E52-252B, 50 Memorial Drive, Cambridge, MA 02142-1347, Phone: (617) 253-1723, Fax: (617) 253-6915  
[wheaton@mit.edu](mailto:wheaton@mit.edu)