Moody’s Analytics U.S. Commercial Properties Price Indexes

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Agenda

1. Importance of Commercial Property Price Indexes (CPPI)
2. Construction of Moody’s Analytics CPPI: Data & Methodology
3. Outlook for Commercial Property Prices
4. Q&A
Importance of CRE Property Price Indexes (CPPI)
Why Do We Need CPPIs?

CPPIs based on commercial real estate pricing provide insight on holding time and the price appreciation of properties and property sectors.

Policymakers, economists and data analysts use commercial property price indexes to gauge the performance of financial instruments, invest in infrastructure, and regulate excesses in real estate markets.
Occupancy Rates Landscape

» Multifamily was the first sector to benefit from the economic recovery
  - Growth in asking and effective rent peaked in 2015
  - Developers have been building apartment units at a pace unseen since the late 1980s
» Collaborative work environments and technology have reduced traditional office space demand
  - Annual rent growth has been anemic
» Retail is suffering from the rise of online commerce
  - Shopping centers with grocery stores or pharmacies are doing relatively well
  - Malls are flailing
» Online shopping has hurt retail, but helped the industrial sector
**Occupancy Rates Diverge**
Occupancy rates by sector, 2004=100

**Cap Rates Converge**
Capitalization rates by sector, 2004Q1=100

Sources: REIS, Moody’s Analytics
Cap Rates Landscape

» Property values across commercial real estate sectors recovered at similar rates
  - Despite the strong demand of multifamily and industrial, and the tepid recovery in the office and retail sectors
  - A disproportionate share of transactions will involve properties with willing sellers and highly motivated buyers.

» Transaction-based cap rates are subject to selection bias

» CPPIs uses repeat sales methodology
  - Controls for the selection bias
  - Accounts for differences in quality of the property
Indexes

» Historical data are based on sales transactions sourced from REIS

» The six new CPPI indexes are:
  - Multifamily
  - Commercial
    - Industrial
    - Office
    - Retail
  - Total

» The Commercial index is an aggregate of the industrial, office and retail indexes

» The Total index aggregates all four sector indexes
Data Preparation

Identify sale pairs from sale transactions

» Data Selection
  – Valid location details
  – Valid sale price

» Sales details
  – Arms length transactions
  – Non-portfolio sales

» Composite ID from location details

» Sale pairs based on
  – Composite ID
  – Sale dates

» Other factors: Latency and Data Quality
Repeat-Sale Model

\[
\ln \left( \frac{P_{i,n}}{P_{i,n-1}} \right) = \sum_{t=0}^{N} X_{i,t} \beta_t
\]

\[\text{Index}_t = \prod_{k=0}^{l} (1 + AR_k)\]

and \((1 + AR_t) = e^{\beta_t}\)

Construction of Index

Data Preparation

- Ordinary Least Squares Method
  - Heteroscedasticity
  - Collinearity

Transaction Level

Set of filters
- Linearity
- Noise

Sale Pair Level

Most linear data subset

Index

Identify Properties

Scan the data set for suitable region
- Holding Time
- Gross Rate of Return
Indexes – Sectors

2002Q4=100

Sources: REIS, Moody’s Analytics

Retail | Office | Industrial | Multifamily

02Q4 04Q4 06Q4 08Q4 10Q4 12Q4 14Q4 16Q4 18Q4
Indexes – U.S. Composites

2002Q4=100

Sources: REIS, Moody’s Analytics
Outlook for Commercial Property Prices
Forecasting Commercial Property Prices

Commercial Property Price = \sum_{t=1}^{n} \left( 1 \times \frac{R_t}{(1-r)^t} \right)

- \( R_t = f(V_t) \)
- \( V_t = f(A_t, S_t) \)
- \( A_t = f(E_t, PCE_t, \text{etc.}) \)
- \( S_t = f(V_t, PPI_t, C_t) \)
- Commercial = f (Retail, Industrial, Office)
- Total = f (Commercial, Apartment)
Short-Term CPPI Forecasts

Commercial property price indexes by sector, % change yr ago

Sources: REIS, Moody’s Analytics
Long-Term CPPI Forecasts

Commercial property price indexes by sector, 2019Q2=100

Sources: REIS, Moody’s Analytics
Q&A

Questions? Contact us at help@economy.com
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