VALUATION ACCURACY IN VACANT OFFICE PROPERTIES

A COMPARISON BETWEEN APPRAISED CAP RATES AND TRANSACTION CAP RATES

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Contents

• Problem field, research goal and questions
• Theoretical findings
• Research methodology
• Empirical findings
• Conclusions
Dutch Office Market
Problem Field (1)

“Direct Capitalization”

Valuation Inaccuracy

Development Industry

Vacant offices

Space Market

Valuation Inaccuracy

Property value (V)

Required cap rate

Owners selling (supply)

Investors buying (demand)

Capital markets

ASSET MARKET

too high

Cash flow

no

development / transformation profitable?

LANDLORDS (supply)

tenants (demand)

Economic growth

DEVELOPMENT INDUSTRY

Too high

Rent & occupancy

Direct Capitalization
Problem Field (2)

Direct Capitalization

\[ V = \frac{NOI}{Ro} \]  \hspace{1cm} (1)

where,
\begin{align*}
V & \rightarrow \text{property value} \\
NOI & \rightarrow \text{Net Operation Income} \\
Ro & \rightarrow \text{overall capitalization rate (\%)}
\end{align*}

Vacancy risk is reflected in the \textbf{cash flow} and the \textbf{cap rate}
Research Goal

To **determine** and **compare** the **cap rate components** of appraisers and investors **to understand** the differences and similarities in their pricing processes.

To **study** whether any **variation in accuracy** depends upon the **variation in vacancy rate** **to increase awareness** about valuation accuracy for a vacant office property among various market players.
Research Questions

1. To what extent do **appraised cap rates** correspond with **transaction cap rates**?

2. Can the **differences** between appraised cap rates and transaction cap rates be **explained** (partly) by **structural vacancy risk**?
Conceptual Model

I. CAPITALIZATION RATE DETERMINANTS
   a. context
   b. location
   c. property
   d. office-users

II. VALUATION ACCURACY
   a. appraised cap rate (RV)
   b. transaction cap rate (RTP)
   c. |RV vs. RTP|
   d. (RV vs. RTP)

III. PRICING PROCESSES
   g. RV determinants
   h. RTP determinants
   i. differences & similarities

IV. different types of vacancy
   j. valuation accuracy vs. different vacancy types
Theoretical Framework
Cap Rate Theory (1)

Static cap rate model

Gordon model

\[
V = \frac{NOI}{r - g} \quad \Rightarrow \quad R_o = r - g
\]

where

- \( r \) = expected required rate of return
- \( g \) = expected rate of growth in the NOI
Cap Rate Theory (2)  

Dynamic cap rate model

\[ R_O = r_f + \frac{L}{V} \left( r_D - r_f \right) + \left( 1 - \frac{L}{V} \right) \left( r_{p_1} + r_{p_2} \right) - g \]

**vs.**

\[ R_O = r_f + \frac{L}{V} \left( r_D - r_f \right) + \left( 1 - \frac{L}{V} \right) \left( r_{p_1} + r_{p_{2a}} + r_{p_{2b}} + r_{p_{2c}} \right) - g \]

- \( r_f \) = risk free rate,
- \( L/V \) = Loan-to-value ratio,
- \( r_D \) = rate of return on debt,
- \( r_{p_1} \) = premium from participation in real estate,
- \( r_{p_2} \) = premium on property-specific attributes
- \( g \) = a constant expected rate of growth in the NOI
- \( r_{p_{2a}} \) = premium on location attributes
- \( r_{p_{2b}} \) = premium on property-itself attributes
- \( r_{p_{2c}} \) = premium on property-user attributes
Dynamic Cap Rate Model

Cap rate determinants

**CONTEXT**
- Macro-economic
- Capital market
- Office market trends
- Sale conditions

**LOCATION**
- Macro location
- Micro location

**PROPERTY**
- Building conditions
- Ownership status
- Accessibility
- Environmental condition

**OFFICE-USERS**
- Tenant type
- Rental Contract
Research Methodology
Data
Transaction Cap Rates

ex-post

\[
Ro = \frac{NOI}{V}
\]

Total Rental Income (TRI) = LFA m2 x effective rent value

Net Operating Income (NOI) = TRI - operating expenses

\[
\text{NOI}
\]

TRANSACTION CAP RATE

\[
\text{Gross transaction price} = \text{Net transaction price} \times (1+KK\%)
\]

NET TRANSACTION PRICE
Effective rents

- within property
- ave. in the radius 500 m
- ave. in the radius 1000 m
- ave. in property’s district
Research Methods

Method 1: total variance test

Method 2: multiple regression

Method 3: One-Way ANOVA test
Empirical Findings
Hypothesis 1 | Overstated and smoothed appraised cap rates

\[ \bar{\Delta} \rightarrow 50\% \]

\[ \bar{R}_V \rightarrow 9.3\% \quad SD \rightarrow 1.2\% \]

\[ \bar{R}_{TP} \rightarrow 6.0\% \quad SD \rightarrow 4.4\% \]

\[ \bar{R}_{avg} \rightarrow 6.6\% \]
Cap Rate Development
per year & per Amsterdam district
Hypothesis 2 | Forward looking investors vs. backward looking appraisers

<table>
<thead>
<tr>
<th>Coefficients transaction vs. Appraised cap rates with context variables</th>
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<tbody>
<tr>
<td><strong>Transaction Cap Rates</strong></td>
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<td><strong>(Constant)</strong></td>
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<td><strong>OfficeJobs</strong></td>
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<td><strong>OfficeInvest</strong></td>
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<td><strong>RentR</strong></td>
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<td><strong>LnAge</strong></td>
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<td><strong>LnAfsDB2_4C_Station</strong></td>
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<td><strong>Asbest</strong></td>
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</table>
Hypothesis 2 | Forward looking investors vs. backward looking appraisers

step 1
CONTEXT
2% < 11%

step 2
LOCATION
30% > 23%

step 3
PROPERTY
19% > 6%

$R^2$
51% 40%
Hypothesis 2 | Forward looking investors vs. backward looking appraisers

\[
\begin{align*}
R_{TP} & \quad R_{V} \\
\text{step 1} & \quad \text{Year dummies} \quad 9\% \quad < \quad 18\% \\
\text{step 2} & \quad 30\% \quad > \quad 19\% \\
\text{step 3} & \quad 15\% \quad > \quad 5\% \\
R^2 & \quad 54\% \quad 40\% 
\end{align*}
\]
Hypothesis 3 | Structural vacancy as a paradoxical phenomenon

Vacancy risks:
Market conformed vacancy
Potential structural vacancy
Structural vacancy

![Graph showing the impact of vacancy risks over time.](image-url)
Hypothesis 3 | Structural vacancy as a paradoxical phenomenon

Vacancy risks:
Market conformed vacancy
Potential structural vacancy
Structural vacancy

WOZ-value fiction

![Graph showing vacancy risks](image)
Conclusions
Appraised vs. Transaction Cap Rates

1. To what extent do appraised cap rates correspond with transaction cap rates?

- Consistently overstated and smoothed appraised cap rates (an average deviation of 50%)

- Differ in their contributing factors: backward looking appraisers vs. forward looking investors
Vacancy and Valuation Accuracy Myth

2. Can the differences between appraised cap rates and transaction cap rates be explained (partly) by structural vacancy risk?

- Transaction of a structurally vacant office is an exceptional situation

- The lack of market evidence can be interpreted as a probability of overvalued vacant office properties