The impact of building features on the building’s financial performance

“Do pre-crisis and after-crisis features decide?”

Master Thesis Presentation

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Real Estate & Housing | Faculty of Architecture
Delft University of Technology
The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

ORGANISATION

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The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

Content

- Introduction
- Theoretical Framework
- Methodology
- Results (Descriptive)
- Results (Statistical Modelling)
- Discussion
- Conclusion
The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

INTRODUCTION
Introduction

Problem definition

- Financial crisis
- Both investors and tenants have become more critical
- Rational basis for investments is lacking
- True building qualities become important
- ‘Willingness to pay’
- ‘Location’ as the single decision-making criterion has become outdated
Hypothesis

The building features are of such importance to the net rental income of an office building that it needs to be considered as a decision-making criterion in the acquisition strategy of an institutional real estate investor.

Building features  =  physical features at building level
Net rental income  =  financial performance of an office building
Decision-making criterion  =  what criteria to use
Acquisition strategy  =  which building to choose
Main Research Question

Which pre-crisis and after-crisis, physical and non-physical office building features, are to be distinguished to improve the set of decision-making criteria for the acquisition of office buildings by institutional real estate investors? What recommendations can be made to implement these features into an acquisition strategy?
Theoretical Framework
The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

- The Dutch office market
  - Cyclical market
  - Regional markets

- Decision-making criteria

- Acquisition process
  - Type of investor
  - Type of market
  - Time horizon
  - Acceptable levels of risk
  - Practical behaviour (professionals)
  - Rational behaviour (literature)
## Conclusion

<table>
<thead>
<tr>
<th>Regional Market Features</th>
<th>Location Features</th>
<th>Building Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacancy rate</td>
<td>Urbanisation class</td>
<td>LFA/GFA ratio</td>
</tr>
<tr>
<td>Absorption rate</td>
<td>Position towards Randstad</td>
<td>Average LFA per floor</td>
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<tr>
<td></td>
<td>Number of residents</td>
<td>Mixed use of functions</td>
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<td>Location surrounding type</td>
<td>Façade material</td>
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<td></td>
<td>Distance to public transport</td>
<td>Shape of footprint</td>
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<td></td>
<td>Distance to highway</td>
<td>Shape of façade</td>
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<td>Distance to NS</td>
<td>Charisma of Entrance</td>
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<td>Number of parking places</td>
<td>Climate control systems</td>
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<tr>
<td></td>
<td>Parking norm</td>
<td>Age</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of floors</td>
</tr>
</tbody>
</table>

- Number of floors
- Free standing
- Energy label
- Spatial lay-out
- Type of use
- Flexibility
Portfolio NSI

177 office buildings
Geographically dispersed
A⁻ and B⁺ locations
892 m² - 22283 m²
0,8 € - 30 € million book value
The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”
Regression modelling

Net Rental Income = $b_0 + b_1 \text{ Regional Market Features} + b_2 \text{ Location Features} + b_3 \text{ Building Features} + \varepsilon_i$
Dependent variable (outcome value)

**Net Rental Income**

<table>
<thead>
<tr>
<th>Contractual Rental Income</th>
<th>Gross Rental Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent Free</td>
<td>Costs of Bad Debts</td>
</tr>
<tr>
<td></td>
<td>Operating Expenses</td>
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<td></td>
<td>Fixed costs</td>
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<tr>
<td></td>
<td>Insurance Expenses</td>
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<td></td>
<td>Scheduled maintenance</td>
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<tr>
<td></td>
<td>Unscheduled maintenance</td>
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<tr>
<td></td>
<td>Marketing costs</td>
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<td></td>
<td>New rental costs</td>
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<td></td>
<td>Preparation for letting</td>
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<td></td>
<td>Service charges</td>
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<tr>
<td></td>
<td>Management Fees</td>
</tr>
</tbody>
</table>

Net rental Income

\[ Y_i = (b_0 + b_1 X_i) + \varepsilon_i \]
Independent variable (predictors)

Regional Market Features
- DTZ regional market indicators (i.e. absorption vs. supply)

Location Features
- Location within the Netherlands (i.e. urban vs. rural)
- Type of location (i.e. office park vs. residential area)
- Orientation towards the Randstad

Building features
- I.e. material, shape, use, attractiveness, flexibility

\[ Y_i = (b_0 + b_1 X_i) + \varepsilon_i \]
The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

Building Features

\[ Y_i = (b_0 + b_1 X_i) + \varepsilon_i \]
The impact of building features on the building’s financial performance

“Do pre-crisis and after-crisis features decide?”

RESULTS
Descriptive statistics

**Age**

[Graph showing average age of the portfolio in years with lines for average age, net rental income, and gross rental income per m² LFA.]
Descriptive statistics

Location surrounding

Quarterly NOI (€) per m² LFA

Office Park
Industrial Zone
Town Centre
Residential Area

‘pre-crisis’
‘after-crisis’
Descriptive statistics

Use

![Graph showing quarterly NRI(€) per m2 LFA for Single Tenant and Multi Tenant over time]

- The graph compares the quarterly NRI(€) per m2 LFA for Single Tenant and Multi Tenant over a period from '00-1 to '13-3.
- There is a general downward trend for both categories, with a sharper decline for Multi Tenant after the '08-3 quarter.
- The peak for Single Tenant is around '00-3, while Multi Tenant peaks at '01-1.
- The trough for Single Tenant is near '13-1, and for Multi Tenant, it is slightly lower around '13-3.

[Legend: Blue line = Single Tenant, Red line = Multi Tenant]
Descriptive statistics

- Outperformance ‘less urbanised’ areas from 2008 onwards
- Offices in residential areas outperform office parks from 2008 onwards
- Positive relation with the attractiveness of the entrance
- Negative relation with the building’s age
- No relation with the building’s material and shape.
- Complex buildings show a constant underperformance
- Medium adjustable buildings outperform highly adjustable buildings
The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

Statistical Model

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Distance to public transport</td>
<td>,618</td>
<td>,138</td>
<td>,359</td>
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<tr>
<td></td>
<td>Number of residents in place of location</td>
<td>,091</td>
<td>,188</td>
<td>,193</td>
</tr>
<tr>
<td>Building Features</td>
<td>Charisma entrance inside</td>
<td>,000</td>
<td>,000</td>
<td>,000</td>
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<tr>
<td></td>
<td>Building type</td>
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<td>,034</td>
<td>,003</td>
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<td></td>
<td>Using typology</td>
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<td>,058</td>
<td>,000</td>
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<tr>
<td></td>
<td>Adjustability of lay-out</td>
<td>,032</td>
<td>,090</td>
<td>,202</td>
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<tr>
<td></td>
<td>Number of floors</td>
<td>,356</td>
<td>,093</td>
<td>,872</td>
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<tr>
<td></td>
<td>Age</td>
<td>,001</td>
<td>,001</td>
<td>,938</td>
</tr>
</tbody>
</table>

Criterion: sig. < 0.050
Conclusion

If not on A+ location:

• Building features have a significant impact on the building’s financial performance

• $\uparrow$ Age = $\downarrow$ Net Rental Income

• $\uparrow$ Attractive entrance = $\uparrow$ Net Rental Income

• High rise & Complex buildings = $\downarrow$ Net Rental Income

• Single tenant” = $\uparrow$ Net Rental Income

• Medium adjustable layout” = $\uparrow$ Net Rental Income

It appears that location features are less important in after-crisis periods compared to pre-crisis periods. Whereas building features such as entrance, building typology and using typology remain at least equally important.
Conclusion

If not on A+ location:

- ↑ Age = ↓ Net Rental Income
- ↑ Attractive entrance = ↑ Net Rental Income
- High rise & Complex buildings = ↓ Net Rental Income
DISCUSSION
Implementation

Optimal office building:

• Basic office typology
• Average size
• Attractive entrance
• Rather new building
• Medium flexible layout
• Single tenant
• Large city outside the Randstad
The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

Implementation

<table>
<thead>
<tr>
<th>Building characteristics</th>
<th>Horapark, Ede (selection criteria)</th>
<th>Hanzeweg, Gouda (opposite selection criteria)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Quarterly Net Rental Income (€/m²)</td>
<td>31,1</td>
<td>10,9</td>
</tr>
<tr>
<td>Number of Residents</td>
<td>108,763</td>
<td>71,235</td>
</tr>
<tr>
<td>Relation towards the Randstad</td>
<td>Outside Randstad</td>
<td>Inner Randstad</td>
</tr>
<tr>
<td>Charisma of the entrance from inside</td>
<td>Attractive</td>
<td>Unattractive</td>
</tr>
<tr>
<td>Building typology</td>
<td>Basic</td>
<td>Complex</td>
</tr>
<tr>
<td>Type of use</td>
<td>Single tenant</td>
<td>Multi-tenant</td>
</tr>
<tr>
<td>Adjustability of layout</td>
<td>Medium adjustable</td>
<td>Very adjustable</td>
</tr>
<tr>
<td>Age (years, in 2013)</td>
<td>10</td>
<td>27</td>
</tr>
</tbody>
</table>
Implementation

Performance (NRI)
Restrictions and limitations

- No A+ locations
-Few directly comparable studies/literature
- Effects of sustainability
- Certain degree of subjectivity
Recommendations for NSI

- Location, building, quality
- Incorporate building features in the decision-making process
- Focus on larger cities outside the Randstad (+80,000 residents)
- Emphasis on building features in after-crisis periods
- Do not focus on high-rise or complex buildings
Recommendations for further research

• Repeat research every 3 to 5 years
  - Expiring rental contracts
  - Changing market circumstances

• Incorporate A+ locations in a similar study

• Extend the scope of this research at building level features
Pre-crisis and after-crisis building features are of such importance to an office building’s financial performance that they should be considered as a decision-making criterion in the acquisition strategy of an institutional real estate investors.

- Physical and non-physical building features have a significant impact
- Different impact of building features and location features in pre-crisis and after-crisis periods.
- It influences the building’s financial performance
The impact of building features on the building’s financial performance

“Do pre-crisis and after-crisis features decide?”
The impact of building features on the building’s financial performance

“Do pre-crisis and after-crisis features decide?”
Research Outline

- Formulate hypothesis
- Adjust hypothesis
- Test hypothesis
- Create knowledge

Relate knowledge to existing theory and findings
Descriptive statistics

Level of Urbanisation

The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

Quarterly NRI(€) per m² LFA

‘pre-crisis’

‘after-crisis’
Descriptive statistics

Location

The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”
Descriptive statistics

Entrance inside

The impact of building features on the building’s financial performance
“Do pre-crisis and after-crisis features decide?”

Descriptive statistics

Entrance inside

Quarterly NRI(€) per m2 LFA

<table>
<thead>
<tr>
<th>Year</th>
<th>Attractive</th>
<th>Medium</th>
<th>Unattractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-1</td>
<td>40</td>
<td>35</td>
<td>30</td>
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<tr>
<td>2001-2</td>
<td>38</td>
<td>32</td>
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<td>2001-3</td>
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<td>26</td>
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<tr>
<td>2002-1</td>
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<td>29</td>
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<td>2002-2</td>
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<td>2002-3</td>
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<td>2002-4</td>
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<td>2003-1</td>
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</table>

The graph shows the quarterly NRI(€) per m2 LFA for Attractive, Medium, and Unattractive entrances from 2001 to 2013. The data indicates a decline in the NRI(€) over time, with Attractive entrances showing the most significant drop.
Descriptive statistics

Net Rental Income

The impact of building features on the building’s financial performance
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Building Features

\[ Y_i = (b_0 + b_1 X_i) + \varepsilon_i \]
Relevance

“Within the current real estate market tenants have a strong bargaining position and can be more critical in assessing individual elements of the real estate objects.”

“It has become more important to start your line of reasoning from the tenant’s perspective in order to anticipate their wishes. Physical building aspects, from both the interior as well as exterior of the building, are expected to be become a focus point from the tenant’s perspective.”

Quotes from Het Financieel Dagblad and DTZ Vastgoed Monitor
Cyclical market

Economic indicators

- Consumer confidence
- Unemployment
- Gross Domestic Product
Regional markets

Regional Absorption of office space
Regional markets

Regional supply of office space

- Amsterdam: 15%
- Zuid: 12%
- Oost: 7%
- Den Haag: 6%
- Rotterdam: 8%
- Noord: 8%
- West: 12%
- Utrecht: 5%
- West Noord: 14%
- West Zuid: overig
- Overig: 13%

Graph showing the supply of office space from 2002 to 2011. The graph indicates a significant increase in supply, particularly in 2006 and 2011.
Dependent variable (outcome value)

\[ Y_i = (b_0 + b_1 X_i) + \varepsilon_i \]

Number of cases
Regression modelling

Basic principle: \( \text{Outcome}_i = (\text{model}) + \text{error}_i \)

Simple regression: \( Y_i = (b_0 + b_1 X_i) + \varepsilon_i \)

Multiple regression: \( Y_i = (b_0 + b_1 X_{i1} + b_2 X_{2i} + ... + b_n X_{ni}) + \varepsilon_i \)