The Future Value of Investing in Adaptivity in Offices

P5 Presentation - Tom van Eerden

10-4-2018
Content

• Introduction
• Definitions & scope
  • Background of Adaptivity
  • Investing in Adaptivity
  • Valuation methods
• Case
• Conclusions
• Recommendations
Problem statement
Problem statement

Figure 1: The division of levels in vacancy & sqm extracted from supply (CLO, 2016; Dynamis, 2017)
Trends

Figure 3: Grootschalige kantooropnames verleden tijd (bureau stedelijke planning, 2017)
Cycle
Research aim

The aim of this research is to develop a financial decision model for an owner/investor to value the future value of adaptivity for an investment in an office building in the Netherlands.

By showing the uncertainties and advantages of investing in adaptivity during the total technical life cycle, the willingness to invest in the adaptive capacity of an office building could be increased.
Research question

• How to cope with future uncertainty in a DCF method to value the adaptive capacity of office buildings to stimulate investors to invest in adaptivity?
Research question

- How to cope with future uncertainty in a DCF method to value the adaptive capacity of office buildings to stimulate investors to invest in adaptivity?
  - What is adaptivity?
Research question

- How to cope with future uncertainty in a DCF method to value the adaptive capacity of office buildings to stimulate investors to invest in adaptivity?
  - What is adaptivity?

- What is the reason to invest in adaptivity?
Research question

• How to cope with future uncertainty in a DCF method to value the adaptive capacity of office buildings to stimulate investors to invest in adaptivity?
  • What is adaptivity?

• What is the reason to invest in adaptivity?

• What are the crucial inputs within the current valuation method and what should be added to the method?
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• Recommendations
Definitions & Scope - Adaptivity
Definitions & Scope - Adaptivity

Use dynamics

Transformation dynamics
Definitions & Scope - Adaptivity

Use dynamics

Transformation dynamics
Definitions & Scope - Adaptivity

Table 25: Accessibility of facility components

<table>
<thead>
<tr>
<th>Rank</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hardly or not accessible; components on support level (Bad)</td>
</tr>
<tr>
<td>2</td>
<td>Limited accessible; partly on support and infill level (Normal)</td>
</tr>
<tr>
<td>3</td>
<td>Good accessible; many components on infill level (Better)</td>
</tr>
<tr>
<td>4</td>
<td>Very good accessible; most components on infill level (Best)</td>
</tr>
</tbody>
</table>

FLEX 2.0

Figure 8: FLEX 2.0 (Geraedts, 2013)
Definitions & Scope – Investing in Adaptivity

Commercial investor

Investor-owner
Definitions & Scope – Valuation methods
Definitions & Scope – Valuation methods

Decision Tree Analysis (DTA)  Monte Carlo Simulation  Option Theory
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Case - Methodology

Step 0: Project information
Step 1: Formulating Adaptivity requirements
Step 2: Assumptions
Step 3: Calculation
Case

“de Schelde”, Bergen op Zoom, Noord-Brabant
Case

Figure 20: Concept plattegronden (Brink Groep, 2011)
Case

TRADITIONAL

41%

FLEXIBLE

64%
Case
Case

Step 0: Project information
Step 1: Formulating Adaptivity requirements
Step 2: Assumptions
Step 3: Calculation
Case

FLEXIBLE

OPTIMUM

64%

72%
Case

NPV related to adaptivity score

Adaptivity score (in %)

NPV

0 20% 40% 60% 80% 100%

-€2,500,000 -€2,000,000 -€1,500,000 -€1,000,000 -€500,000 €0
Case
Case

INVESTMENT1

- FLEXIBLE
  - WAIT
    - TRANSFORM
  - TRANSFORM
- TRADITIONAL
  - WAIT
    - TRANSFORM
Case

INVESTMENT1

- TRADITIONAL
  - WAIT
    - WAAR
    - ONWAAR

- FLEXIBLE
  - WAIT
    - WAAR
    - ONWAAR

Decision

WAAR 0,0%
€ 578.971

ONWAAR
€ 578.971

Decision

WAAR 0,0%
-€ 339.720

INVESTMENT1

- TRADITIONAL
  - WAIT
    - WAAR
    - ONWAAR

- FLEXIBLE
  - WAIT
    - WAAR
    - ONWAAR

Decision

WAAR 0,0%
€ 747.991

ONWAAR
-€ 747.991

INVESTMENT1

- TRADITIONAL
  - WAIT
    - WAAR
    - ONWAAR

- FLEXIBLE
  - WAIT
    - WAAR
    - ONWAAR

Decision

WAAR 0,0%
-€ 1,562,735

INVESTMENT1

- TRADITIONAL
  - WAIT
    - WAAR
    - ONWAAR

- FLEXIBLE
  - WAIT
    - WAAR
    - ONWAAR

Decision

WAAR 0,0%
€ 578.971

ONWAAR
€ 578.971

Decision

WAAR 0,0%
-€ 339.720

INVESTMENT1

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- FLEXIBLE
  - WAIT
    - WAAR
    - ONWAAR

Decision

WAAR 0,0%
-€ 1,562,735
Case

INVESTMENT1

- FLEXIBLE
  - ONWAAR
    - Decision
      - WAAR
    - TRANSFORM
      - WAAR

- TRADITIONAL
  - WAIT
  - WAAR
    - Decision
      - ONWAAR
    - TRANSFORM
      - ONWAAR

Decision

€ 578.971
ONWAAR

€ 747.991
WAAR

-€ 339.720
-€ 1.562.735

€ 747.991
ONWAAR

€ 747.991
WAAR

-€ 339.720
-€ 1.562.735
1\textsuperscript{st} Decision:
- 100\% Adaptivity
- Optimum Adaptivity (72\%)
- 0\% Adaptivity
Case

1st Event (for every branch):
- Good Market scenario
- Moderate Market scenario
- Bad Market scenario
### Case

2<sup>de</sup> Decision (for every branch):
- Wait
- Transform (all different functions)
Case

Graph showing two NPV values:
- Original case: Highest NPV
- Stochastic eNPV

The graph indicates the NPVs in Euros, with values ranging from €0 to €800,000.
Case

- Original case NPV
- Highest NPV
- Stochastic eNPV North Brabant
- Stochastic eNPV Amsterdam

NPVs in Euros:

- € 0
- € 500,000
- € 1,000,000
- € 1,500,000
- € 2,000,000
- € 2,500,000
- € 3,000,000
Case
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Conclusions

How to cope with future uncertainty in a DCF method to value the adaptive capacity of office buildings to stimulate investors to invest in adaptivity?

• Use dynamics vs transformations dynamics
• Valuation method contains:

  ![Diagram](image1)

  ![Diagram](image2)

• Addition on valuation method:

  ![Diagram](image3)

• **The location** of a property influences the outcome.
Recommendations

• **Multiple case study** to verify if the ratio of investment costs and transformation costs related to the adaptive indicators are right, it is recommended to do further research with more cases.

• To **bundle the adaptive indicators into packages**, it will be more clear in which of the adaptive indicators the investor should be investing. Especially for the short term investors it could be interesting.

• To further examine the financial aspects in the financial model to conclude about the environmental **impact of not using adaptivity** after one functional life cycle.

• To do a **qualitative research** about the different investors and their motives to invest in adaptivity.

• To do a **case study with different locations** in the Netherlands and define the impact of the location and the local market on the investment decision to invest in adaptivity in new developments and **renovate/transform of existing buildings**.
Thank you!
References


Brink Groep (2018). Location indicator list made by colleagues.


Steps of the investor

- Check the requirements
- Determine timespan
- Formulate dynamics
- Constraints and Concerns
- Determine solution
- Weigh the financial impact
- Investment Decision

Figure 13: own ill.
Case

Stochastic Case
Case

Extra cost %
Contribution to Variance

Surplus free of floor height / Assessment value -
Distinction between support - infill / Assessment value -
Dismountable facade / Assessment value -
Surplus of load bearing capacity of floors / Assessment value -
10 / Assessment value -
Surplus of building space / floor space / Assessment value -
Surplus of site space / Assessment value -
Extendable building / Unit horizontal / Assessment value -
Disconnecting/detailed connection interior walls; hor/vert. / Assessment value -
Disconnectable, removable, relocatable units in building / Assessment value -
Surplus capacity of facilities / Assessment value -
Disconnectable, removable, relocatable interior walls / Assessment value -
Customisability and controlliability of facilities / Assessment value -
Surplus of facilities shafts and ducts / Assessment value -
Extendable building / Unit vertical / Assessment value -
Disconnection of facilities components / Assessment value -

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Figure 30: (own ill.)

Stochastic Case
Case