Analysis of Financial Consequences of Spatial Decisions: Framework and Case Studies

Analysis on Financial Consequences of Spatial Decisions – Pismen et al. (2015)
(1) Introduction
(2) Spatial policy decisions and financial compensation
(3) Spatial policy recommendations

(4) Property Valuation
(5) Cases
   Case 1: Changing land use destination
   Case 2: Changing building programs
   Case 3: Brownfield development
Research questions:

• Impact of spatial policy on property value?

• Financial compensations?

• Adaptation of the planning system?

Report (Dutch)
Context:

- Renewal of spatial policy in Flanders - [Greenpaper](#)
- Financial crisis, limited public (and private) resources
Several decisions in spatial policy have a financial impact:

- Generic decisions and legislation
- Area-specific decisions and policies
- Decisions related to actual projects
- Interventions (public and private), not related to the specific project or area but with a financial impact
(2) Spatial policy decisions and financial compensation

Only (changes in) zoning plans give rise to compensation

• Compensation of financial losses (80%)

• Plan income charge: taxation on added value created (20%)
(2) Spatial policy decisions and financial compensation

**Price/m² Flanders**

- **residential**
- **industrial**
- **agricultural**
- **forest, nature**
- **recreation**
- **public**

![Bar Chart: Price/m² Flanders](image)

- **Q25**
- **GP50 (average)**
- **Q75**
(3) Spatial policy recommendations

Be aware of possible financial consequences of decisions

Monitor the changes in property values, and develop calculation instruments

Develop financial arguments to support the spatial policy

Harmonise and broaden the financial compensation mechanisms
(4) Property Valuation

Fair value of property =

- “Price that would be received ...an orderly transaction between market participants at the measurement date” (IASB, IFRS)
(4) Property Valuation

Value of land depends on*:

- Current land use
- Specific use characteristics
- Construction and adaptation costs
- Perception of the market
- Location of the parcel and characteristics of the surroundings
- Macro-economic factors

* Sirmans, MacDonalds, Machperson & Zietz (2006); Vissers & Van Dam (2006); Kroll & Cray (2010); Damen, Vastmans & Buyst (2014)
(4) Property Valuation

Combination of methods depending on effects of spatial decisions and availability of data.

• Hedonic method (mass appraisal)
• Residual value method (~ building plots)
• Comparative method (individual appraisal)
• Capitalization method (~ rent, income)
• Construction costs (~ building cost)
(4) Property Valuation

Combinations of methods used in selected case studies

<table>
<thead>
<tr>
<th>Case study</th>
<th>Land use</th>
<th>Mass appraisal (hedonic)</th>
<th>Residual value method</th>
<th>Specific market studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Change in land use</td>
<td>Agriculture; Natural park</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Changing building program</td>
<td>Residential</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>3 Brown field development</td>
<td>Residential</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>
(5) Case 1: Changing Land Use Destination

1a. Description:

Event: Land use plan changes zonation:

‘agricultural land use ’ → ‘natural park’

Case: parcel (0.3 ha) situated in a small river valley, used for agriculture
(5) Case 1: Changing Land Use Destination

1b. Valuation method:
Site specific hedonic study made by Flemish Land Agency
- Dependent variable: market price
- Independent variables:
  - legal status (agricultural / natural park )
  - use value for agriculture (score: 1-100)

Results
- Loss of value of 34 %
- Half due to lower market prices
- Half due to lower Use Value (% related to a best case situation)
(5) Case 1: Changing Land Use Destination

1c. Compensation:

<table>
<thead>
<tr>
<th>Land owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gets financial compensation for change in legal status and future market price, But - Only if parcel size = + 0.5 ha - limited to 80% of the change in value</td>
</tr>
</tbody>
</table>
### 1d. Results

<table>
<thead>
<tr>
<th>(1) Market value parcel (300 m²) in k€</th>
<th>BEFORE PLAN (REF) ‘Agriculture’</th>
<th>AFTER PLAN ‘Natural area’</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Change in market value (k€)</td>
<td></td>
<td>-3.9</td>
</tr>
<tr>
<td>(3) Existing governmental compensations</td>
<td>Min 0</td>
<td>Max 3.1</td>
</tr>
<tr>
<td></td>
<td>Max (80%) 3.1</td>
<td></td>
</tr>
<tr>
<td>(4) Change for landowner, after com. (k€)</td>
<td>Min -3.9</td>
<td>Max -0.8</td>
</tr>
</tbody>
</table>

#### Case 1: Changing Land Use Destination
1e. Conclusion

- Spatial policies and change in legal status affects market value of a parcel, irrespective of its actual use.
- Effect of change in zonation + effect of possible limitations for use have an impact on total financial value
- Full compensation by government is not guaranteed
- Compensation is given at the moment of (legal) change in zonation, not on the moment of change in use.
(5) Case 2: Changing Building Programs

2a. Description:

- **Event**: Change in general spatial policy with greater flexibility regarding the program
- **Case**: Small parcel in urban fringe (270m²);
  - from 2 floors (reference) to 4 floors (policy scenario)
  - Possible additional apartment (+ 125m² floor space)
2b. Valuation method: Residual value method

- **Gross income**
  - Net present value of future rents
  - rents based on hedonic study (Vastmans et al. 2012) ([www.huurschatter.be](http://www.huurschatter.be) – Flemish government)
  - Accounts for location of the property and relevant characteristics

- **Building costs /m²**
  - web-based tools
  - (m² living area, level of completion, type of building, quality of construction, workmanship)

- **Assumptions**
  - Simplified method (no maintenance, no fiscal incentives)
  - Discount rate: 3% and 4% (required return on investment)
(5) Case 2: Changing Building Programs

2c. *Compensation*: No compensation

2d. *Results*: (creation of additional apartment of 125m²)

<table>
<thead>
<tr>
<th></th>
<th>Reference scenario (2 floors)</th>
<th>Policy scenario (4 floors)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>(1) Floor space (m²)</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>(2) Rent (€/year/m²)</td>
<td>5,9</td>
<td>8,6</td>
</tr>
<tr>
<td>(3) Gross income (k€/year)</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>(4) Discount rate</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>(5) Current value future rents (k€)</td>
<td>266</td>
<td>393</td>
</tr>
<tr>
<td>(6) Building costs (k€)</td>
<td>-163</td>
<td>-201</td>
</tr>
<tr>
<td>(7) Residual value parcel (k€) (€/m²)</td>
<td>92</td>
<td>172</td>
</tr>
<tr>
<td></td>
<td>341</td>
<td>637</td>
</tr>
<tr>
<td>(8) Change in value (per parcel) (k€) (€/m²)</td>
<td></td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>185</td>
<td>637</td>
</tr>
</tbody>
</table>
(5) Case 2: Changing Building Programs

2e. Conclusion

• Doubling in rentable floor size leads to doubling total gross income, as the local market appreciates this type of small apartments
• Value of the small parcel + 54 % to 100 %
• No compensation mechanism
• Added value is created on the moment of receiving the building permit for 4 floors-program
(5) Case 3: Brown field development

1a. Description:

Event: Brownfield redevelopment, Land use changes (industrial or residential + building programs)

Case: parcel 4 ha, rural area, nearby river Scheldt.
3a. Description:

**Event**: Brownfield redevelopment, Land use changes (industrial or residential + building programs)

**Case**: parcel 4 ha, rural area, nearby river Scheldt.

- alternative land uses and programs,
  - Residential use (with high and low density),
  - Industrial use (SME and waterfront industries (waterIND))
3b. Valuation method: Residual value method

- **Gross income**
  - Residential scenarios: idem as case 2
  - Industrial land uses:
    - SME: data from market studies (local + regional)
    - Waterfront industries: specific long term contracts Flemish government

- **Building costs /m²**
  - + additional costs for land development (grey and green infrastructure)
  - Rough approach for SME and commercial buildings
  - + subsidies for quay development (waterfront industries)

- **Assumptions**
  - Discount rate: 4% (societal perspective for industrial uses)
### Case 3: Brown field development

#### 3c. Compensation: case specific, subsidies for remediation and quay development

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>Residential</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
<td>SME</td>
</tr>
<tr>
<td>Land uses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² floor area</td>
<td>1000 m²</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Grey infrastructure</td>
<td>1000 m²</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Green infrastructure</td>
<td>1000 m²</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Gross income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² floor area *</td>
<td>1000 m²</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Rent €/year/m²</td>
<td>€/m²</td>
<td>5,9</td>
<td>5,9</td>
</tr>
<tr>
<td>Total rent year</td>
<td>k€/year</td>
<td>1.288</td>
<td>952</td>
</tr>
<tr>
<td>Current Value future rents (4 %)</td>
<td>million €</td>
<td>32</td>
<td>24</td>
</tr>
<tr>
<td>Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building costs</td>
<td>million €</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>Grey infrastructure</td>
<td>million €</td>
<td>0,5</td>
<td>0,5</td>
</tr>
<tr>
<td>Green infrastructure</td>
<td>million €</td>
<td>0,9</td>
<td>0,9</td>
</tr>
<tr>
<td>Total costs</td>
<td>million €</td>
<td>27</td>
<td>21</td>
</tr>
<tr>
<td>Net income</td>
<td>million €</td>
<td>5,0</td>
<td>3,3</td>
</tr>
<tr>
<td>€/m²</td>
<td>120</td>
<td>79</td>
<td>55</td>
</tr>
</tbody>
</table>

* m² floor area for waterfront industry is building and grey infrastructure
(5) Case 3: Brown field development

For comparison: Remediation of pollution

- 2 to 12 million € (with / without subsidy)
- Same for all scenario’s.

3e. Conclusion

- Comparable appraisal of effects of spatial decisions is much more complex in this case (multiple land-uses or programs, industry,..). Limited data available due to specific elements (waterfront location, brownfield,..)
- Large difference in values depending on land uses and on programs.
- Illustrates both potential and difficulties to select combinations of land uses and programs that allow to compensate for remediation costs.
Questions?

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