Determinants for the valuation of land
Theoretical considerations and practical applications

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* This presentation represents the authors’ personal opinions and does not necessarily reflect the views of the Deutsche Bundesbank or its staff.
Outline of the presentation

• Theoretical concepts of land valuation
• Methodological approach for this study
• Area of investigation
• Preliminary results

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Why care for land values?

- Financial stability (G 20 initiative towards closing of data gaps)
- Official statistics
  - National accounts (e.g. land-structure split)
  - Consumer price index (owner occupied housing, house price index)
- Investment decisions
- Urban development and planning

We analyse value-determining factors for land, particularly undeveloped plots, only.
Location, location, location: Theoretical approaches to land values

- Location rent approach
- Classical economic approach
- Neoclassical approach
- Social-economic approach
Cost gradient of monocentric city: How to describe the location in a simple model?

Additionally:
- Value of amenities
- Future rent increases
- Political decisions
Setting a price for location: Pricing of amenities

- Land rents
- Transportation costs
- Open spaces
- Clear water
- Schooling
- View

Early applications in a monocentristic framework (Muth, Thünen, Alonso)

Later applications in a neoclassical framework

Rather new applications in a socio-economic framework (GIS software etc.)
Case study of location specific amenities: The alpine region of Austria

Source: wikipedia.org
Case study of location specific amenities: Topography

Source: openstreetmap.org
Case study of location specific amenities: Sunshine duration in winter

Source: tirol.gv.at
Area of investigation

Source: tirol.gv.at
Sentiment effects in assets

Weather effects in assets
Hirshleifer (2001)
Hirshleifer et al. (2003)

Find good weather has a positive effect on stock returns.

Investor sentiment
Edemanns et al. (2007)

Find sport events have multiple effects on stock returns and volumes.

(amongst others)
**Does sunshine duration matter?**  
**First results**

<table>
<thead>
<tr>
<th></th>
<th>Restricted</th>
<th>Unrestricted</th>
</tr>
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<tbody>
<tr>
<td>Intercept</td>
<td>6.08*** (0.103)</td>
<td>4.71*** (0.349)</td>
</tr>
<tr>
<td>Distance to public transport</td>
<td>-0.07 (0.202)</td>
<td>0.011 (0.186)</td>
</tr>
<tr>
<td>Distance to town centre</td>
<td>-0.12 (0.062)</td>
<td>-0.12* (0.057)</td>
</tr>
<tr>
<td>Distance to Innsbruck</td>
<td>-0.02** (0.007)</td>
<td>-0.01* (0.007)</td>
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<tr>
<td>Sunshine duration after 3 p.m.</td>
<td></td>
<td>0.09*** (0.023)</td>
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<tr>
<td>R²</td>
<td>0.12</td>
<td>0.28</td>
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<tr>
<td>R² adjusted</td>
<td>0.09</td>
<td>0.24</td>
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<tr>
<td>AIC</td>
<td>-16.50</td>
<td>-30.39</td>
</tr>
<tr>
<td>Observations</td>
<td>83</td>
<td>83</td>
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Conclusions

- Land values and prices are still important for many applications, such as national accounts, investment decisions, and financial stability, though lesser academic research in this area.

- Amenities and socio-economic factors drive the land prices considerably.

- Additional facts (e.g. sunshine duration) have major effects and should be considered in a hedonic model in order to measure ‘pure’ price movements.