ERES Industry Seminar

A century of tenant protection in Germany: An emergency measure that became permanent

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Motivation

- Economists are skeptical wrt the state intervention in the housing market.
- Policy makers and general public support regulations.
- After WWI:
  - rent control,
  - protection of tenants from eviction,
  - housing rationing,
  - support of (social) housing construction.
- The macroeconomic consequences of regulations are unknown.
Theory: Prices and rents

- Needleman (1965): If a part of the market is regulated, then the excess demand flows to an unregulated part. The prices and rents there are higher than without restrictions.

- Hubert (1993):
  - short run: rent control in case of acute housing shortage $\rightarrow$ higher rents in the unregulated market.
  - long run: since the old tenants don't move from large dwellings, the redistribution and rent decreases are hindered.

- Basu and Emerson (2000): Removal of rent control $\rightarrow$ lower rent. Rent control and eviction protection raise the non-payment risks $\rightarrow$ Landlords set higher rents.
Theory: Housing supply

- Downs (1988): Even if rent control only covers “old housing”, the investors are afraid that control can be extended to the new housing.
- Early and Phelps (1999): The more time elapse since introduction of rent control the less probable the new restrictions. Incentives for new construction resurge, but in a very long run.
- Häckner and Nyberg (2000):
  - short run: growing real incomes thanks to the rent control → more dwellings built in less attractive areas.
  - long run: incentives diminish, for low rents in such areas don't cover construction cost.
Motivation

- **Aim**: to evaluate the effects of regulations on the housing market.
- Regulation degree is measured by the indices of Kholodilin (2016):
  - Original data: over 170 legal acts (laws and ordinances).
  - Level: national and Länder.
## Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Period</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>real housing prices</td>
<td>1970q1-2016q3</td>
<td>OECD</td>
</tr>
<tr>
<td>price-income ratio</td>
<td>1980q1-2016q3</td>
<td>OECD</td>
</tr>
<tr>
<td>price-rent ratio</td>
<td>1970q1-2016q3</td>
<td>OECD</td>
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<tr>
<td>real rents</td>
<td>1962m1-2016m12</td>
<td>Destatis</td>
</tr>
<tr>
<td>completed dwellings</td>
<td>1949-2015</td>
<td>Destatis</td>
</tr>
<tr>
<td>real GDP per capita</td>
<td>1970q1-2016q3</td>
<td>Destatis, own calculations</td>
</tr>
<tr>
<td>real 3-month interest rate</td>
<td>1959m12-2016m12</td>
<td>Bundesbank, own calculations</td>
</tr>
<tr>
<td>net migration</td>
<td>1950-2015</td>
<td>Destatis</td>
</tr>
<tr>
<td>regulation indices</td>
<td>1914-2015</td>
<td>Kholodilin (2016)</td>
</tr>
</tbody>
</table>
Dependent variables: quarterly

**Real prices**

Index, 2010=100

Source: OECD

**Price-to-rent ratio**

Index, 2010=100

Source: OECD

**Price-to-income ratio**

Index, 2010=100

Source: OECD

**Real rent**

Index, 2010=100

Source: Destatis, own calculations

Source: OECD

Source: Destatis, own calculations
Dependent variables: annual

Completed dwellings

1000 dwellings


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Control variables

Real GDP

Net migration

Real interest rate

Index, 2010=100

Net migration

Real interest rate

%
Regulation indices

Rent control

Housing rationing

Encouraging social housing

Overall regulation index

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Data

- **Dependent variables:**
  - annual,
  - quarterly.

- **Explanatory variables:**
  - high frequency: aggregated,
  - low frequency: interpolated using splines.

- **Stationarity tests ADF and PP:**
  - most variables are integrated.

- **Cointegration test of Pesaran et al. (2001):**
  - no cointegration.
Estimation technique

- Autoregressive distributed lag model ARDL:

\[ y_t = \sum_{p=1}^{P} \alpha_p y_{t-p} + \sum_{k=1}^{K} \sum_{q=q_k}^{Q_k} \beta_{qk} x_{k,t-q} + \varepsilon_t \]

- $y_t$ — dependent variable;
- $x_{kt}$ — $k$-th explanatory variable;
- $\varepsilon_t$ — random error;
- $\alpha$ and $\beta$ — parameter,
- $q_k$ — smallest lag (0 or 1).
Method

- To avoid multicollinearity — 1 regulation index per regression.
- To avoid endogeneity — the lag of regulation indices starts at 1.
- Optimal number of lags determined using Akaike criterion:
  - maximum number of lags: 4.
  - number of lag permutations: 2000.
Based on ARDL long-run effects for each explanatory variable $x_k$:

$$LRE_{x_k} = \frac{\sum_{q=q_k}^{Q} \beta_{qk}}{1 - \sum_{p=1}^{P} \alpha_p}$$

- $\beta_{qk}$ — $k$-th element of the parameter vector $\beta_q$.

- Confidence interval is computed using bootstrap with 1000 replications.
## Short-run effects

<table>
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<th>Explanatory variable</th>
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<tr>
<td>Real GDP</td>
<td>+</td>
<td>−</td>
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<tr>
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<td>+</td>
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<td>+</td>
<td>+</td>
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<tr>
<td>Real interest rate</td>
<td>−</td>
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<td>+</td>
<td>+</td>
<td>−</td>
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<tr>
<td>Social housing</td>
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<td></td>
<td>+</td>
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<td>Overall regulation</td>
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