Who Bears the Burden of Real Estate Transfer Taxes? Evidence from the German Housing Market

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Policies to Fight Inequality: Housing Policy and Wealth Inequality
29 November 2023
Rising property prices (at least prior to COVID) have fueled a debate on the affordability of housing in Germany.

Numerous policy measures aiming to reduce housing costs have been implemented in recent years (e.g. rent control, subsidies...).

Several further propositions aiming to make housing purchases more affordable: cutting transfer tax rates, broad subsidy schemes, ...

At the same time, German states have repeatedly increased real estate transfer tax (RETT) rates.
How do such RETT rate hikes affect property prices?

- Existing literature mainly focuses on temporary tax changes (e.g., Besley et al., 2014) or discontinuities in the tax schedule (e.g., Kopczuk and Monroe, 2015; Slemrod et al., 2017).
- Evidence for Germany is based on highly aggregated data (e.g., Petkova and Weichenrieder, 2017; Budisch and Dresselhaus, 2018).
We study the price effects of RETT rate hikes using theoretical modeling and empirical analysis.

Empirical analysis is based on an extensive data set covering more than 18 million properties offered for sale between 2005 and 2019.

We also study whether price effects differ ...

- ... across single-family houses, apartments, and apartment buildings, and/or
- ... by driving channel: accounting for transaction frequencies, bargaining power and downpayment constraints.
The German Real Estate Transfer Tax

- RETT applies to residential and non-residential property and is paid by buyer.
- Until August 2006: Uniform RETT rate of 3.5% set by federal government.
- Federal reform in September 2006: States are responsible for setting RETT rate; tax rate hikes in all but two states in the following years (in some states multiple hikes).
- Revenue in 2019: 15.8 billion Euro; clear upward trend prior to COVID (2006: 6.1 bio.; 2012: 7.4 bio.).
- Only 5% of state tax revenue, but most important tax states have control over.
Current Tax Rates

tax rate changes

[Map showing current tax rates across different regions in Germany with tax rates ranging from 3.5% to 6.5%.]
We set up a (highly stylized) model to get a benchmark for the price effect of an RETT rate hike and to derive testable hypotheses.

Two-period Nash-bargaining model with overlapping generations aka buyers and sellers.

First-period buyers may sell property in second period.

Property price $p$ depends on (exogenous) transaction probability $q$, the buyer’s bargaining power $\beta$ and property tax rate $\tau$. 
In general, the (semi-)elasticity of the house price with respect to a tax rate hike is a function of $q$ and $\beta$, i.e., $\epsilon = \epsilon(q, \beta)$, with

$$\left| \frac{\delta \epsilon}{\delta \beta} \right| < 0 \text{ and } \left| \frac{\delta \epsilon}{\delta q} \right| > 0. \quad (1)$$

Focusing on the polar cases $\beta = 0$ (seller has all bargaining power) and $\beta = 1$ (buyer has all bargaining power) allows computing a range for the semi-elasticity:

$$\epsilon = \left[ -\frac{1}{1 + \tau - \frac{q}{(1+\rho)}} ; 0 \right] \quad (2)$$

Note that the semi-elasticity can become smaller than $-1$!
Data

- Housing market data collected by F+B: comprehensive web-scraped data from more than 140 sources, including online platforms, real-estate agencies, and newspaper ads.
- Data covers roughly 18.5 million properties listed between 2005 and 2019.
- Available information: asking price, posting date, postal code, property characteristics (property size, number of rooms, amenities, etc.).
- Three residential property types: Apartments, apartment buildings, single-family houses.
Empirical Approach (1)

- Event-study design:

\[
\ln(p)_{i,c,t} = \sum_{j=-12}^{23} \beta_j \Delta \tau_{c,t-j} + \nu X_i + \gamma Z_{c,t} + \mu_c + \varsigma_{c,t} + \epsilon_{i,c,t}
\]

- \(i\): Property, \(c\): postal code area, and \(t\): month.
- \(\ln(p)_{i,c,t}\): log of property price per square meter.
- \(\Delta \tau_{c,t-j}\): Size of RETT rate change.
- \(X_i\): Property characteristics, \(Z_{c,t}\): Regional control variables.
- \(\mu_c\): Postal code FE, \(\varsigma_{c,t}\): Month FE × degree of urbanization.
Empirical Approach (2)

- Event window: -12/+24 months, end points adjusted following Schmidheiny and Siegloch (2019).
- Reference period is $t - 4$ to account for announcement effects.
- Control variables are added consecutively to the empirical model.
- Robustness tests include winsorizing based on municipal population growth and exclusion of border regions.
- Currently in the process of updating to a modern event study approach with staggered treatments.
Price Effects: Baseline Results

<table>
<thead>
<tr>
<th>Months before/after tax increase</th>
<th>Price effect</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10</td>
<td>-0.06</td>
<td>-0.08 to -0.04</td>
</tr>
<tr>
<td>-5</td>
<td>-0.04</td>
<td>-0.06 to -0.02</td>
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<td>-0.02 to 0.04</td>
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<tr>
<td>20</td>
<td>0.02</td>
<td>0.00 to 0.04</td>
</tr>
</tbody>
</table>

Graph showing the price effect and 95% confidence interval over months before and after the tax increase.
Interpretation

- **1 pp** RETT rate hike decreases property prices by 3%.
- The RETT is thus born by sellers!
- Results are robust to inclusion/exclusion of controls, winsorizing based on population growth and exclusion of border regions.
- Potential **reasons for overshifting**:
  1. Tax burden of future transactions are capitalized into prices ($q$ is large).
  2. Housing market is a sellers’ market ($\beta$ is close to 0).
  3. Downpayment constraints: RETT not mortgageable (leverage effect!).
- Next step: Utilize proxies for $q$, $\beta$ and downpayment constraints to **test these explanations**.
Distinguishing Different Channels: Capitalization of Future Transactions

- Aggregate data from German property assessors’ office: **Transaction frequencies** of apartments (3.7% relative to housing stock) are twice as high as of houses (1.9%)
- Correspondingly, magnitude of price effects for apartments twice as large

![Graphs showing price effects and 95% confidence intervals for apartments and houses before and after tax increases.](image_url)
Distinguishing Different Channels: Bargaining Power

- Prediction of our theoretical model: The higher sellers’ bargaining power, the lower the price response

- Approach: differentiate between counties with two proxies for seller bargaining power
  - Measure based on time on the market and price discounts in pre-reform period following Carrillo (2013)
  - Growing vs. shrinking housing markets: Growing markets with high demand for properties (sellers’ market)
  - Comparison via sample split
Bargaining Power: Price Effects for Bottom/Top Quartile

((c)) Bottom quartile of seller’s bargaining power

((d)) Top quartile seller’s bargaining power
Bargaining Power: Price Effects for Shrinking vs. Growing Housing Market Regions

((e)) Shrinking Housing Market Regions

((f)) Growing Housing Market Regions
Distinguishing Different Channels: Downpayment Constraints

- Stronger price effects for **liquidity-constrained** and **highly leveraged households** who cannot borrow to pay the tax (Best and Kleven, 2018)

- **Approach:** **differentiate between private and business/institutional investor shares**
  - Households who cannot borrow to pay the tax have stronger price responses
  - Businesses and institutional usually possess enough equity or collateral to secure a loan and are less affected by liquidity constraints

- **Sample split between counties with institutional and business investor share** in the ownership of residential units above/below the median (based on 2011 census)

- If overshifting is driven by downpayment constraints, effects should be larger in markets with low institutional and business investor share, especially for apartments
Price Effects by Institutional/Business Investor Share: Apartments

((g)) Large business/investor share

((h)) Low business/investor share
Conclusion

Main findings:

- A 1 percentage point RETT increase reduces the prices of apartments by about 4% and of single-family houses by about 2%.
- Evidence for substantial overshifting

Findings are well in line with our theoretical model:

- In sellers’ (buyers’) markets, the seller (buyer) bears the tax burden.
- The higher the transaction frequency, the larger is the price effect.

Policy implications: In turn, lowering transfer taxes will likely result in increased prices.
What About Subsidizing Instead of Taxing Property Acquisition?

- Frequent policy proposition: Subsidize housing purchases to increase affordability
- In 2018: German introduction of **housing purchase subsidies** intending to foster homeownership and make the acquisition of property more affordable
- But: subsidies **may exert adverse effects** by driving up real estate prices

→ **How do housing purchase subsidies affect property prices?**

→ Exploit **larger subsidy scheme in Bavaria** in a **border diff-in-diff** design
Preview of Main Findings

- Germany and the German state of Bavaria implemented **flat-rate housing purchase** subsidies for owner-occupiers in 2018
- **Full capitalization** of the Bavarian subsidy into the **prices of single family homes**
- **No effect for apartments**, whose purchasers seldom qualify for the subsidy
- Price effect is larger in market segments with a higher exposure to the subsidy scheme

→ Instead of making house purchases more affordable for families, the subsidy scheme led to a rise in house prices and mainly benefited sellers of properties
Thank you for your attention!

Comments? Questions?

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## Tax Rate Changes (1)

<table>
<thead>
<tr>
<th>State</th>
<th>Initial Tax Rate</th>
<th>Date of Increase</th>
<th>New Tax Rate</th>
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<tbody>
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<td>01.04.2012</td>
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<td>01.01.2017</td>
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A Simple Housing Market Model

- Economy with overlapping generations, two types of agents: the young (Y) and the old (O)
- All agents live for two periods (young in the first, old in the second)
- Fraction q of the young enters the housing market and is matched with an old agent who wants to sell a house
- Fraction 1-q inherits the house and does not enter the housing market
- House price p determined through bargaining
- Proportional transaction tax on house prices: T
A Simple Housing Market Model

Present value of the surplus from buying the house for the young agent:

\[ U_Y + \frac{q}{1 + \rho} p_{t+1} + (1 - q) \frac{U^0}{1 + \rho} - p_t(1 + \tau) \]  

(3)

Present value of the surplus from selling the house for the old agent:

\[ p_t - U^0 \]

Equilibrium house price in period \( t \) given by maximizing the Nash maximand over \( p_t \):

\[ \beta \ln(U_Y + \frac{q}{1 + \rho} p_{t+1} + (1 - q) \frac{U^0}{1 + \rho} - p_t(1 + \tau)) + (1 - \beta) \ln(p_t - U^0) \]
A Simple Housing Market Model

In the steady state prices are the same in each period, steady state house price given by:

\[ p^* \left(1 + \tau - \frac{(1 - \beta)q}{1 + \rho}\right) = \beta U^0 (1 + \tau) + (1 - \beta) (U_Y + (1 - q) \frac{U^0}{1 + \rho}) \]  

(4)

Consider the two polar cases \( \beta = 1 \) and \( \beta = 0 \)

If \( \beta = 1 \):

\[ \frac{dp^*}{d\tau} \frac{1}{p^*} = 0 \]  

(5)

→ changes in T are always fully borne by the seller
If $\beta = 0$:

$$\frac{dp^*}{d\tau} \frac{1}{p^*} = -\frac{1}{1 + \tau - \frac{q}{(1+\rho)}}$$  (6)

- If $q$ converges to zero, a one percentage point increase in the transactions tax reduces the price by approximately one percent.
- If $q$ is positive, the decline in the price will be larger than one percent because the tax increase is also expected to be a burden on future transactions.