

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

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Motivation

- ▶ 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?**

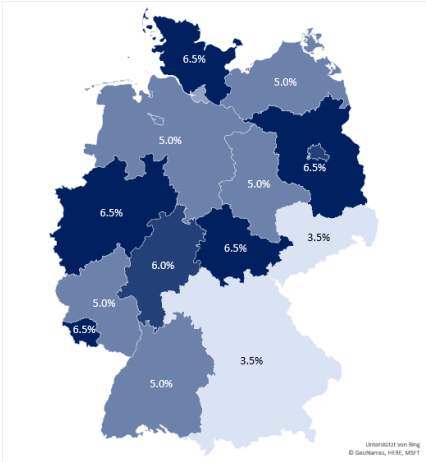
- ▶ Existing literature mainly focuses on temporary tax changes (e.g., Besley et al., 2014) or discontinuities in the tax schedule (e.g., Kopczuk and Monroe, 2015; Slemrod et al., 2017).
- ▶ Evidence for Germany is based on highly aggregated data (e.g., Petkova and Weichenrieder, 2017; Budisch and Dresselhaus, 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

A Simple Housing Market Model (1)

- ▶ 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 β and and property tax rate τ .

A Simple Housing Market Model (2)

- ▶ In general, the (semi-) elasticity of the house price with respect to a tax rate hike is a function of q and β , i.e., $\epsilon = \epsilon(q, \beta)$, with

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

- ▶ 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 !

- ▶ 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:

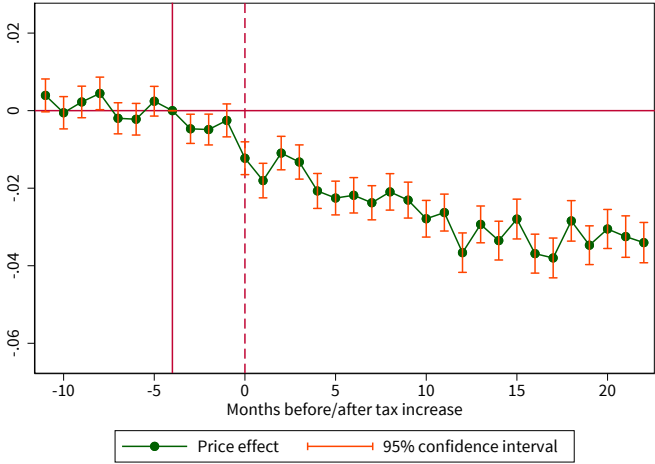
$$\ln(p)_{i,c,t} = \sum_{j=-12}^{23} \beta_j \Delta \tau_{c,t-j} + \nu X_i + \gamma Z_{c,t} + \mu_c + \varsigma_{c,t} + \epsilon_{i,c,t}$$

- ▶ 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.
- ▶ μ_c : Postal code FE, $\varsigma_{c,t}$: Month FE \times 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

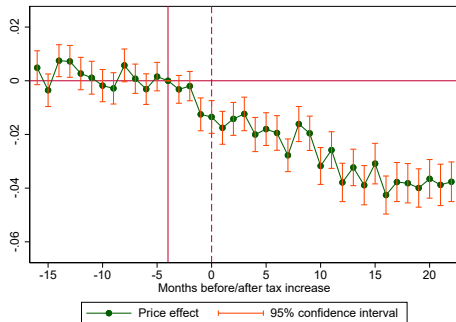


Interpretation

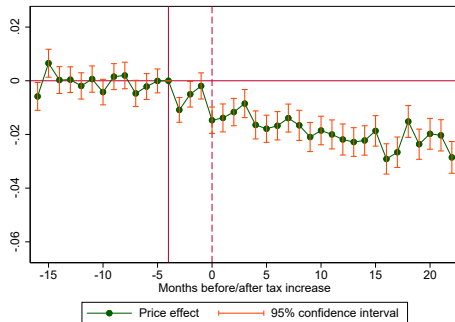
- ▶ **1 pp** RETT rate hike **decreases property prices by 3%**.
- ▶ The RETT is thus **borne by sellers!**
- ▶ Results are robust to inclusion/exclusion of controls, winsorizing based on population growth and exclusion of border regions.
- ▶ Potential **reasons for overshifting**:
 1. Tax burden of future transactions are capitalized into prices (q is large).
 2. Housing market is a sellers' market (β is close to 0).
 3. Downpayment constraints: RETT not mortgageable (leverage effect!).
- ▶ Next step: Utilize proxies for q , β 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



((a)) Apartments

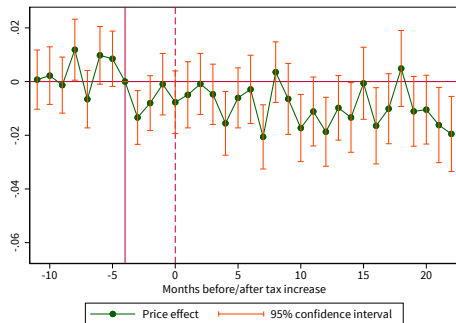


((b)) Houses

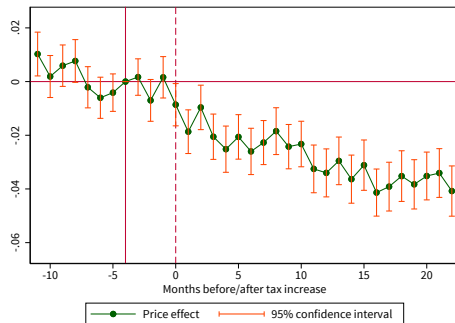
Distinguishing Different Channels: Bargaining Power

- ▶ 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

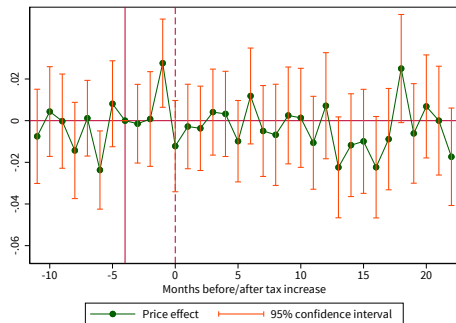


((c)) Bottom quartile of seller's bargaining power

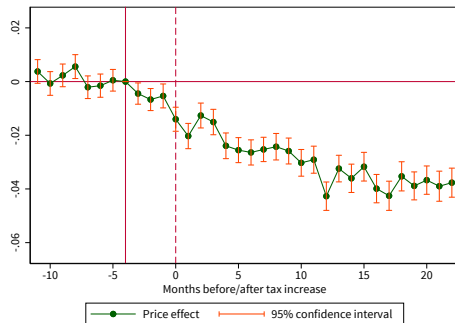


((d)) Top quartile seller's bargaining power

Bargaining Power: Price Effects for Shrinking vs. Growing Housing Market Regions



((e)) Shrinking Housing Market Regions

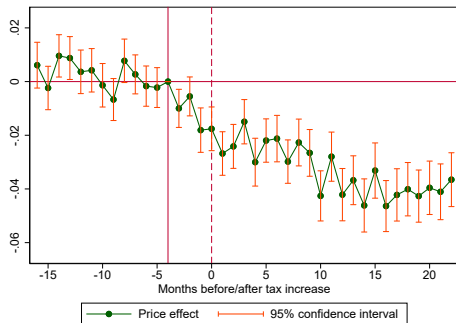


((f)) Growing Housing Market Regions

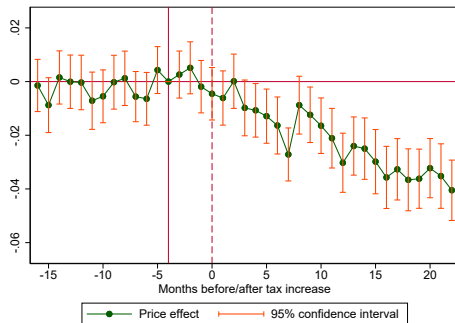
Distinguishing Different Channels: Downpayment Constraints

- ▶ 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)

State	Initial Tax Rate	Date of Increase	New Tax Rate
Baden-Württemberg	3.5%	05.11.2011	5.0%
Bavaria	3.5%	-	-
Berlin	3.5%	01.01.2007	4.5%
		01.04.2012	5.0%
		01.01.2014	6.0%
Brandenburg	3.5%	01.01.2011	5.0%
		01.07.2015	6.5%
Bremen	3.5%	01.01.2011	4.5%
		01.01.2014	5.0%
Hamburg	3.5%	01.01.2009	4.5%
Hesse	3.5%	01.01.2013	5.0%
		01.08.2014	6.0%
Mecklenburg-Western Pomerania	3.5%	01.07.2012	5.0%
Lower Saxony	3.5%	01.01.2011	4.5%
		01.01.2014	5.0%

Tax Rate Changes (2)

State	Initial Tax Rate	Date of Increase	New Tax Rate
North Rhine-Westphalia	3.5%	01.10.2011	5.0%
		01.01.2015	6.5%
Rhineland-Palatinate	3.5%	01.03.2012	5.0%
Saarland	3.5%	01.01.2011	4.0%
		01.01.2012	4.5%
		01.01.2013	5.5%
		01.01.2015	6.5%
Saxony	3.5%	-	-
Saxony-Anhalt	3.5%	02.03.2010	4.5%
		01.03.2012	5.0%
Schleswig-Holstein	3.5%	01.01.2012	5.0%
		01.01.2014	6.5%
Thuringia	3.5%	07.04.2011	5.0%
		01.01.2017	6.5%

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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:

$$U^Y + \frac{q}{1+\rho}p_{t+1} + (1-q)\frac{U^O}{1+\rho} - p_t(1+\tau) \quad (3)$$

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

$$p_t - U^O$$

- ▶ Equilibrium house price in period t given by maximizing the Nash maximand over p_t :

$$\beta \ln\left(U^Y + \frac{q}{1+\rho}p_{t+1} + (1-q)\frac{U^O}{1+\rho} - p_t(1+\tau)\right) + (1-\beta)\ln(p_t - U^O)$$

A Simple Housing Market Model

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

$$p^*(1 + \tau - \frac{(1 - \beta)q}{(1 + \rho)}) = \beta U^0(1 + \tau) + (1 - \beta)(U^Y + (1 - q)\frac{U^0}{(1 + \rho)}) \quad (4)$$

- ▶ Consider the two polar cases $\beta = 1$ and $\beta = 0$

- ▶ If $\beta = 1$:

$$\frac{dp^*}{d\tau} \frac{1}{p^*} = 0 \quad (5)$$

→ changes in T are always fully borne by the seller

A Simple Housing Market Model

- ▶ If $\beta = 0$:

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

- ▶ 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