

War, housing rents, and free market

A case of Berlin, 1909-1917

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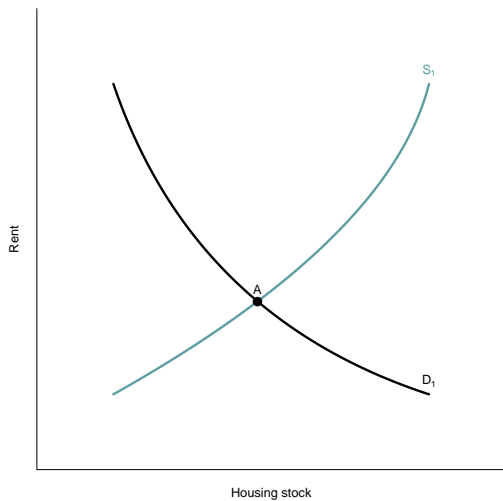
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Higher School of Economics
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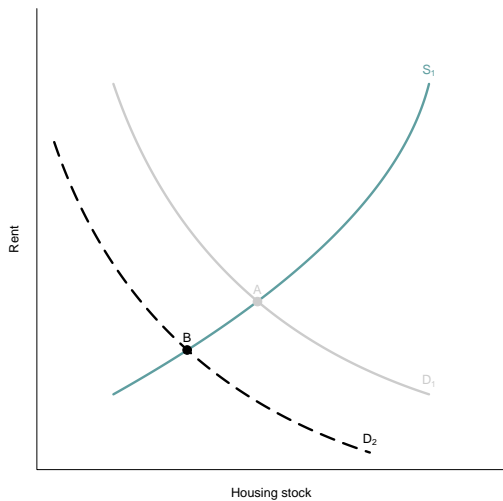
Introduction

- Until the mid-20th century, in European cities **rental housing** used to be **a dominant form of tenancy**.
 - ▶ In Berlin, until the mid-1920s the homeownership rate was 3%.
- Before World War I, **rental housing market was free**:
 - ▶ state barely interfered in landlord-tenant relations;
 - ▶ rents were set freely.

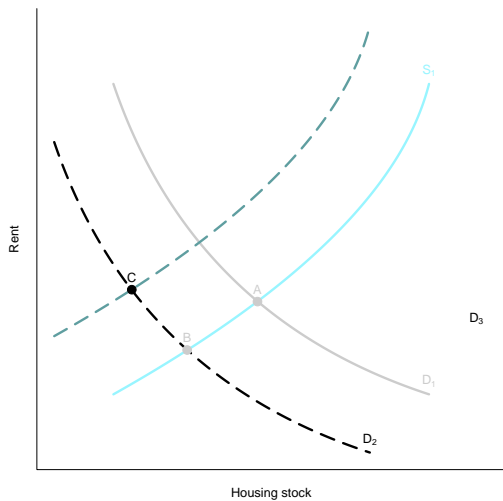
Pre-war equilibrium



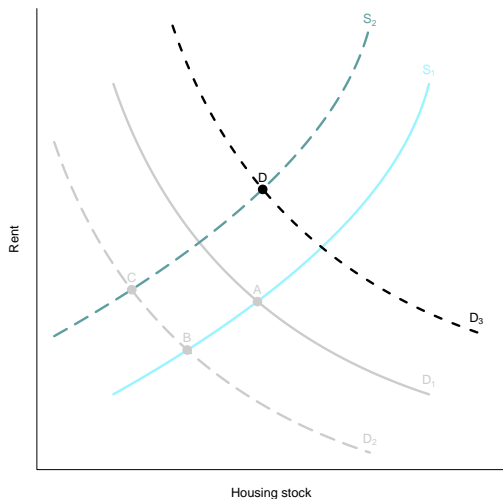
World War I ($D \downarrow$): mobilization (20% of population) & foreigners outflow



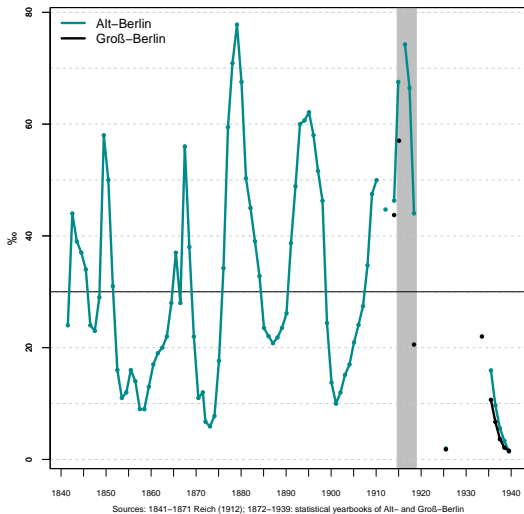
World War I ($S \downarrow$): cessation of housing construction/renovation



World War I ($D \uparrow$): inflow of workers, demobilized soldiers, & household creation



Housing vacancy rate in Berlin, 1872-1939



Regulations

- To avoid turmoil, German authorities intervened in housing market.
 - ① **Protection of tenants from eviction** (26.07.1917):
 - ★ eviction and rent increases subject to decisions by arbitration councils.
 - ② **Housing rationing** (23.09.1918):
 - ★ interdiction to demolish private housing / convert it to non-housing;
 - ★ landlords must report about unused dwellings;
 - ★ local authorities could assign tenants to these dwellings.
 - ③ **Rent controls**:
 - ★ Prussia as one of the 1st federal states froze rents in December 1919.
 - ★ In March 1922, this measure was introduced nationally.
- Since then, housing market has been **always subject to varying degrees of government control**.

Question setting

- **Objective:** examine Berlin's housing rent dynamics during WWI.
- WWI is an ideal period for investigating housing rents:
 - ▶ free market;
 - ▶ large supply and demand shocks.
- Questions to answer:
 - ▶ How did rents react to the shocks?
 - ▶ Was the reaction different depending on market segment?
 - ▶ How did real rent change?

Data

- **Data**: microdata on individual dwellings.
- **Sources**: announcements of rental dwellings placed in two Berlin's most popular advertising papers:
 - ▶ *Berliner Tageblatt und Handels-Zeitung*
 - ▶ *Berliner Lokalanzeiger*.
- **Period**: January 1909 – December 1917.
- **Sample size**: 11,256 observations.

Es sind zu vermieten: 1. eine Wohnung in dem im Walde liegenden Wärterwohnhaus Nr. 4 (1. Gesch.) in km 19.4 der Eisenbahnstrecke Berlin-Potsdam, bestehend aus 1 Stube, 1 Kammer, Küche und Zubehör zum 1. April 1912; 2. eine Wohnung im Beamtenwohnhaus in Potsdam, Alte Luisenstraße 88 (2. Gesch.) bestehend aus 1 Stube und 1 Küche zum 1. März 1912. Die Besichtigungen der Wohnungen vermittelt: im Wärterwohnhaus Nr. 4 die 74. Bahnmeisterei in Zehlendorf-Mitte und in Potsdam die 79. Bahnmeisterei in Wildpark. Bedingungen gemäße Angebote sind bis zum 21. Februar 1912, vormittags 11 Uhr, an das unterzeichnete Betriebsamt einzufenden. Bedingungen sind daselbst einzusehen und für 50 Pfennig verkäuflich. Berlin, im Februar 1912. [4602] Königl. Eisenbahnbetriebsamt 7.

Sofort 4 Zimmer, Bad, April miete-frei. **Schwarzhorststr. 9.** [U 354]

Josachimsthaler Strasse 15.
Gartenh. S. 1, 4-Zim.-Wohnung, 1. April 12. [D 439]

Landwohnung, 3 Zimmer mit Zubehör, großem Obstgarten sofort zu verm. 30 M. **Rüdoko**, Wensickendorf. [18775]

Waldemarstr. 51 [E 37] 4 Zimmer, Bad u. Zubehör, Parkaus-sicht, z. 1. 4. zu verm. Preis 825 M.

Alexander-Ufer 5

(Sehrter Bahnhof) per 1. 4. herrschaftl. Wohnung, 7 Zimmer, Zubeh., electr. Licht, Defen, Warmwassroer., M. 2700.— z. verm. [12910]

Linienstr. 57, III. Et., 3 Zimmer u. Zub.
Wohnung, 7 Zimmer, Zubeh., electr. Licht, Defen, Warmwassroer., M. 2700.— z. verm. [12910]

Parterre-Wohnung mit Erker, Vorgart., 3 Zimmer, Zubeh., Kamm. **Elisabethufer 46**, daselbst Kellern. [F 309]

Belle-Alliancestr. 71a, II. Etage,
4 Zimmer 775 M., besgl. IV. Et. 600 M. [G 423]

6-Zimmer-Wohnung
I. Etage, Selz., Warmwass., Fahrst., sof. od. spät z. verm. **Charlottg., Mommsenstr. 21.** [T 428]

Invalidenstr. 149, III., a. Pappelblag,
sehr schöne 3-Zimmer-Wohnung,
viel Nebengel., Balk., i. Schlafzimm.,
Wasseranschl., per 1. April od. früher
zu verm. 940.— **Bartsch.** [42794]

Schmargendorf, Grunewald,
Cramvasplatz 7. Hochherrsch. 3-Zim.-W.,
Warmwasserheiz. u. versorg. bill. sofort od.
April zu vermiet. Verbindung: Grunewald-Ring 8, A und B und Stadtbahn. [12935]

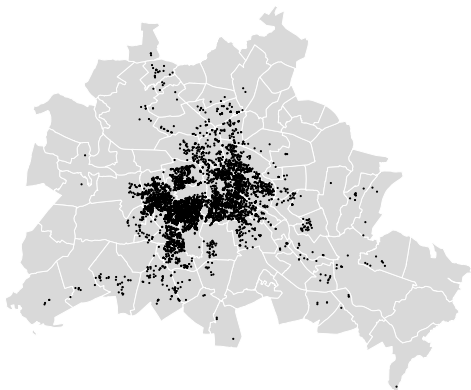
Estimation model

- Hedonic regression for quality adjustment:

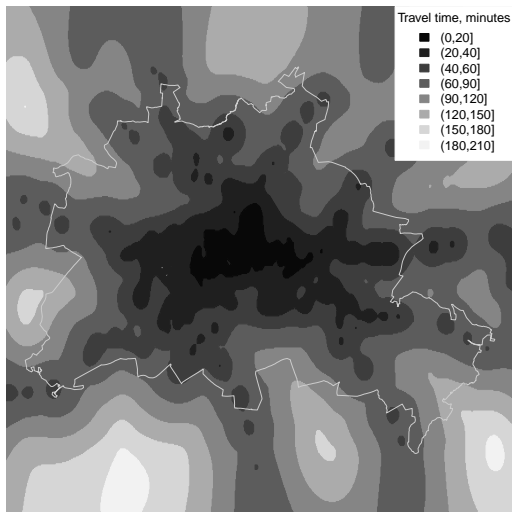
$$p_i = \alpha + X_i' \beta + \sum_{j=1}^J \gamma_j I_{ji}^D + \sum_{k=1}^K \delta_k I_{ki}^{TT} + \sum_{t=1}^T \theta_t I_{ti}^P + u_i$$

- p_i is the annual rent for i -th apartment in marks,
- X_i is the vector of dwelling's structural characteristics;
- I_j^D and I_k^{TT} are the district and travel time dummies, resp.;
- I_t^P are the period (year/month) dummies,
- α , β , γ 's, θ 's, and δ 's are the parameters to estimate;
- u_i is the error term.

Spatial distribution of advertised dwellings



Isochrones of underground, city, and suburban railways for Alexanderplatz, 1912/14



Estimation approach

- Variable selection:

- ▶ automatic model selection approach;
- ▶ exhaustive (“brute force”) search impossible: $n = 22$ candidate variables \rightarrow # of models is $2^n = 4,194,304$;
- ▶ genetic algorithm: explores only a subset of all possible models, randomly but with a bias towards better models.

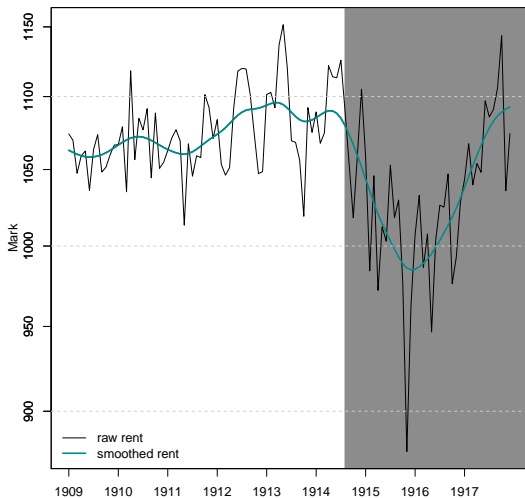
- Estimation methods:

- ▶ Ordinary least squares (OLS):
 - ★ standard estimation approach.
- ▶ Quantile regression:
 - ★ identifies the segment-specific dynamics of rents;
 - ★ distribution free;
 - ★ robust to outliers.

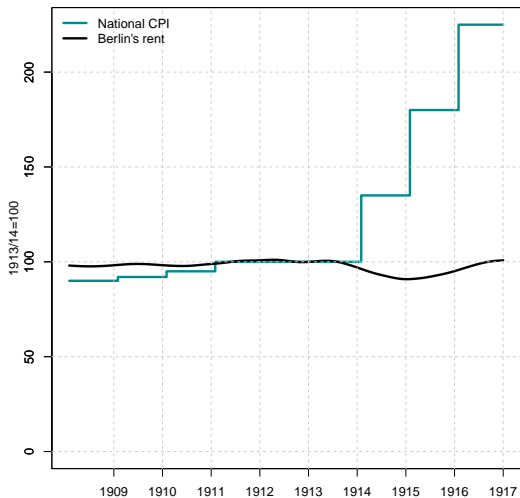
Estimation results

	<i>Dependent variable: Rent</i>	
	<i>OLS</i>	<i>quantile regression</i>
Constant	21.906 (28.574)	162.437*** (10.012)
Room	157.938*** (5.332)	74.462*** (5.303)
Room ²	18.418*** (0.501)	26.914*** (0.777)
Loggia	-29.490** (11.793)	10.132*** (3.103)
Maid's room	-30.583*** (10.391)	0.793 (3.921)
Garden	71.096*** (17.559)	-1.530 (6.063)
Electric light	42.493*** (10.791)	36.302*** (3.466)
Heating: Central	182.922*** (16.446)	157.487*** (4.588)
Heating: Vapor	280.210*** (93.331)	316.314*** (9.187)
Heating: Warm water	117.973*** (14.938)	118.684*** (7.487)
Warm water	53.726*** (10.429)	91.421*** (3.652)
Furnished	464.186*** (17.938)	371.228*** (12.224)
Lift	221.757*** (15.308)	211.984*** (4.642)
Floor: 1	49.781*** (9.035)	69.090*** (4.011)
Floor: 2	40.912*** (9.813)	42.095*** (5.164)
Floor: 3	-44.547*** (10.256)	-4.062 (3.637)
Floor: 4	-66.870*** (15.702)	-15.937*** (5.901)
Floor: Hochparterre	79.723*** (15.246)	107.561*** (9.336)
Floor: Parterre	15.583 (15.633)	0.714 (6.069)
Isochrone: (20,40]	-39.174*** (7.751)	-32.057*** (3.479)
Isochrone: (40,60]	-36.437** (18.559)	-52.540*** (5.671)
Isochrone: (60,90]	-191.930*** (64.742)	-220.081*** (14.704)
Source: Berliner Tageblatt und Handels-Zeitung	48.616*** (6.788)	27.483*** (2.568)
Districts	Yes	Yes
Year/month dummies	Yes	Yes
Observations	11,256	
Adjusted R ²	0.834	
Note:	* p<0.1; ** p<0.05; *** p<0.01	

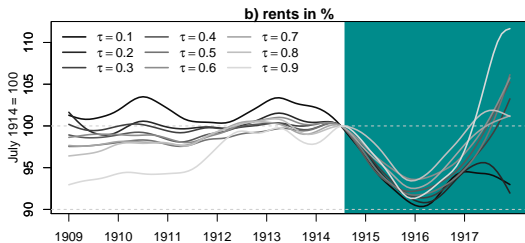
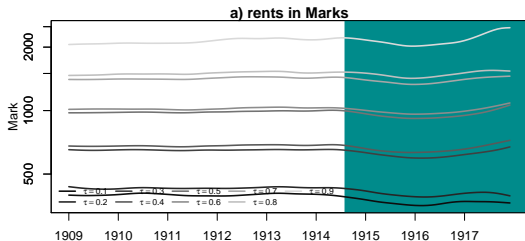
Quality-adjusted housing rent in Berlin, 1909-1917



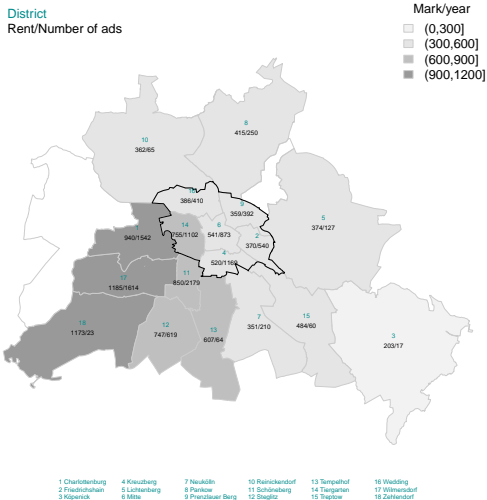
Berlin's rent vs. overall price increase in Deutsches Reich, 1909-1917



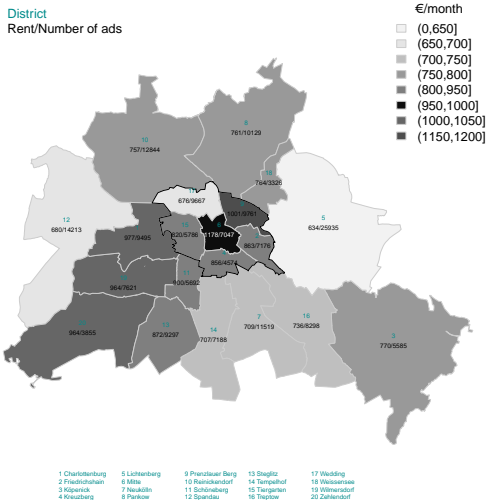
Dynamics of quality-adjusted housing rent in Berlin by segments, 1909-1917



Geographical distribution of quality-adjusted rent in Berlin, July 1914



Geographical distribution of quality-adjusted rent in Berlin, July 2014



Summary

- Rents began to fall already in 1913, accelerated in 1914.
- In the early 1916, rents started to rise again.
- General price level rose steadily from 1914 \Rightarrow real rents went down.
- Cheap apartments as an exception:
 - ▶ more volatile rent: poor people more exposed to business cycle;
 - ▶ rent fell even in the late 1917: filtering down?
- Market rents: downward flexibility, upward rigidity.
- Evidence of “rent screw”.