Land Economics 99(2), May 2023
"Homeowner Subsidy Repeal and Housing Recentralization" by
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Appendix A: Additional Tables and Figures

Tables

Appendix Table A1: EZ-Design – Prerequisites, Recipients, Payments, etc.

	1996–1999	2000–2003	2004–2005
Beneficiary			
Recipient		— Income tax liable individuals —	
Maximum 2-year taxable income	€122,710 (singles) €245,420 (couples)	€81,807 (singles) €163,614 (couples)	€70,000 (singles) €140,000 (couples)
Threshold increase per child	—	€30,678	€30,000
Object			
Subsidized Property		— Owner-occupied property (house or condo) —	
Subsidy			
Funding start		— Year of acquisition —	
Funding period		— 7 subsequent years —	
Child allowance	€767 per child	€767 per child	€800 per child
Yearly subsidy amount (baseline)			
New Construction (q_3)	min {5.0% of q_3, €2,556}	min {5.0% of q_3, €2,556}	min {1.0% of q_3, €1,250}
Existing Property (q_2)	min {2.5% of q_2, €1,278}	min {2.5% of q_2, €1,278}	min {1.0% of q_2, €1,250}

Note: This table shows the schematic structure of the subsidy. The subsidy can be divided into three time periods (second to fourth column): (i) 1996–1999, (ii) 2000–2003, and (iii) 2004–2005. The first change in 2000 applied to income thresholds only: these were reduced but could now also be increased by the presence of children. The second change in 2004 was more comprehensive: not only were the general income thresholds reduced even further, also the distinction between the purchase of existing property and new construction was removed. From now on, both types of owner-occupied housing were subsidized equally. Over the entire period, the subsidy was paid out only upon moving into the owner-occupied property and then for a total period of eight years.
Source: German Home Owners' Allowance Act *(Eigenheimzulagegesetz [EigZulG])* with its amendments.

Appendix Table A2: Ring Households by Number of Children

	1 child	2 children	3(+) children
Peri × Post	−0.023*	−0.063***	−0.057**
	(0.013)	(0.019)	(0.027)
Aff × Peri × Post	−0.091*	−0.065	−0.113***
	(0.051)	(0.047)	(0.050)
City FE	✓	✓	✓
Year FE	✓	✓	✓
Ring FE	✓	✓	✓
City × Year FE	✓	✓	✓
City × Ring FE	✓	✓	✓
Adj. R^2	0.999	0.998	0.996
Num. obs.	6960	6953	6910
Num. clusters (city)	46	46	46

Note: OLS regressions with the logarithm of ring households with variable number of children as the response variable. Clustered standard errors (at city level) in parentheses.
Data: cities in BBSR cities (see Appendix Table C2). *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Appendix Table A3: Ring Population with continuous treatment

	(1)	(2)	(3)	(4)	(5)
Distance	0.205***	0.208***			
	(0.039)	(0.036)			
Peri × (Distance − $\tilde{\mathbf{r}}$/3)	−0.636***	−0.638***	−0.678***	−0.675***	
	(0.068)	(0.065)	(0.077)	(0.075)	
Peri × Post	0.706**	0.677**	0.976***	1.218***	−0.016
	(0.298)	(0.138)	(0.243)	(0.337)	(0.057)
($\overline{\text{Price}}$ – Price) × Peri × Post	−0.961***	−0.958***	−0.920***	−1.248***	−0.014***
	(0.376)	(0.376)	(0.320)	(0.448)	(0.080)
City FE	✓	✓	✓	✓	✓
Year FE		✓	✓	✓	✓
Ring FE			✓	✓	✓
City × Year FE				✓	✓
City × Ring FE					✓
Adj. R^2	0.782	0.782	0.814	0.799	0.997
Num. obs.	13933	13933	13933	13933	13933
Num. clusters (city)	77	77	77	77	77

Note: OLS regressions with the logarithm of ring population as the response variable. Clustered standard errors (at city level) in parentheses. Data: full sample of BBSR and KOSTAT cities (see Appendix Table C2). *** p < 0.01; ** p < 0.05; * p < 0.1.

Appendix Table A4: Ring Households with children and continuous treatment

	(1)	(2)	(3)	(4)	(5)
Distance	0.249***	0.244***			
	(0.048)	(0.043)			
Peri × (Distance − $\tilde{\mathbf{r}}$/3)	−0.658***	−0.656***	−0.558***	−0.556***	
	(0.088)	(0.085)	(0.084)	(0.081)	
Peri × Post	0.769**	0.805**	1.181***	1.409***	−0.001
	(0.365)	(0.397)	(0.300)	(0.355)	(0.077)
($\overline{\text{Price}}$ – Price) × Peri × Post	−1.088**	−1.095**	−1.262***	−1.587***	−0.076
	(0.439)	(0.441)	(0.369)	(0.438)	(0.104)
City FE	✓	✓	✓	✓	✓
Year FE		✓	✓	✓	✓
Ring FE			✓	✓	✓
City × Year FE				✓	✓
City × Ring FE					✓
Adj. R^2	0.787	0.786	0.839	0.828	0.999
Num. obs.	7125	7125	7125	7125	7125
Num. clusters (city)	46	46	46	46	46

Note: OLS regressions with the logarithm of ring households with children as the response variable. Clustered standard errors (at city level) in parentheses. Data: cites in BBSR sample (see Appendix Table C2). *** p < 0.01; ** p < 0.05; * p < 0.1.

Appendix Table A5: Ring Households with varying number of children and continuous treatment

	1 child	2 children	3(+) children
Peri × Post	0.009	−0.045	0.049
	(0.069)	(0.083)	(0.121)
($\overline{\text{Price}}$ − Price) × Peri × Post	−0.068	−0.040	−0.185
	(0.096)	(0.113)	(0.158)
City FE	✓	✓	✓
Year FE	✓	✓	✓
Ring FE	✓	✓	✓
City × Year FE	✓	✓	✓
City × Ring FE	✓	✓	✓
Adj. R^2	0.999	0.998	0.996
Num. obs.	6960	6953	6910
Num. clusters (city)	46	46	46

Note: OLS regressions with the logarithm of ring households with variable number of children as the response variable. Clustered standard errors (at city level) in parentheses. Data: cities in BBSR cities (see Appendix Table C2). *** p < 0.01; ** p < 0.05; * p < 0.1.

Appendix Table A6: Ring Households with Children with spline knot at $\tilde{r}/4$

	(1)	(2)	(3)	(4)	(5)
Distance	0.470***	0.458***			
	(0.070)	(0.060)			
Peri × (Distance − $\tilde{\mathbf{r}}$/3)	−0.843***	−0.833***	−0.658***	−0.668***	
	(0.101)	(0.093)	(0.118)	(0.120)	
Peri × Post	0.136	0.190	0.221**	0.250**	−0.041*
	(0.096)	(0.150)	(0.086)	(0.093)	(0.016)
Aff × Peri × Post	−0.580**	−0.570**	−0.486***	−0.720***	−0.074
	(0.146)	(0.146)	(0.149)	(0.220)	(0.061)
City FE	✓	✓	✓	✓	✓
Year FE		✓	✓	✓	✓
Ring FE			✓	✓	✓
City × Year FE				✓	✓
City × Ring FE					✓
Adj. R^2	0.780	0.780	0.822	0.810	0.999
Num. obs.	7125	7125	7125	7125	7125
Num. clusters (city)	46	46	46	46	46

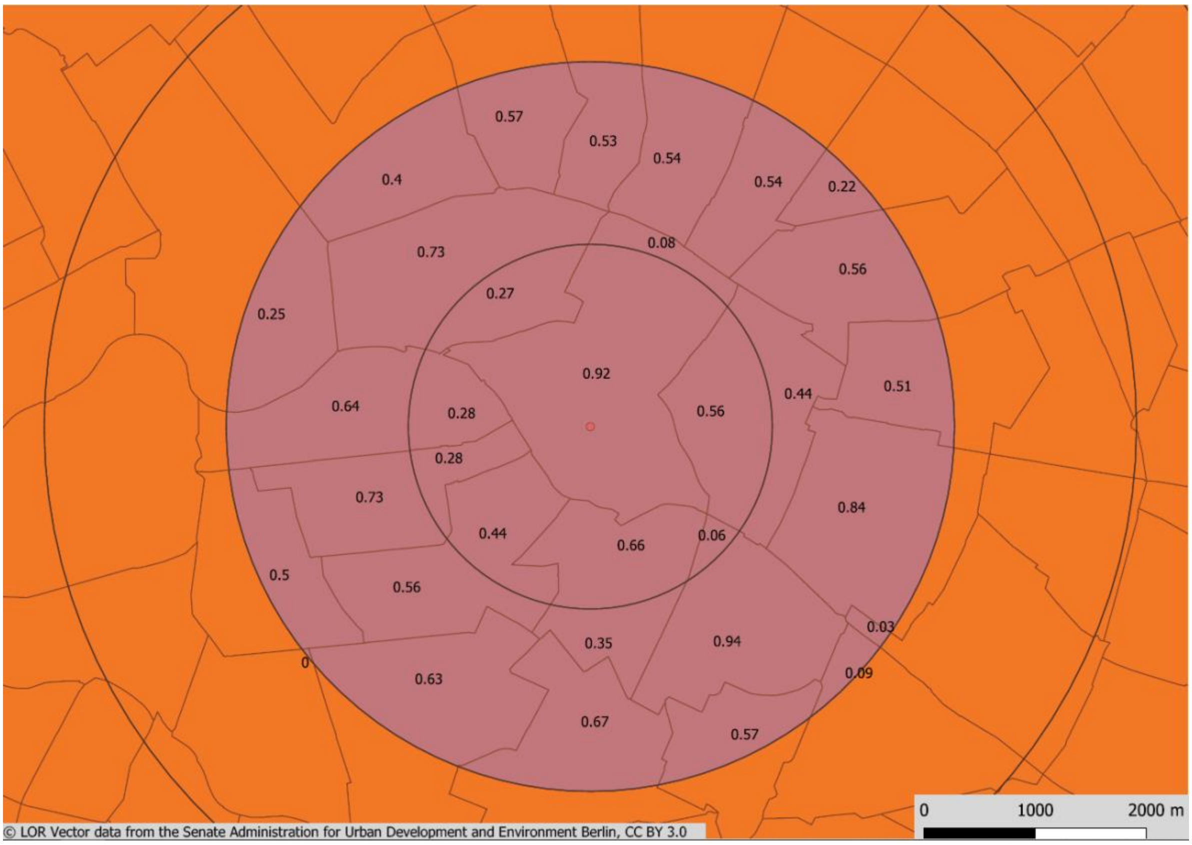
Note: OLS regressions with the logarithm of ring households with children as the response variable. Clustered standard errors (at city level) in parentheses. Data: cities in BBSR sample (see Appendix Table D2). *** p < 0.01; ** p < 0.05; * p < 0.1.

Appendix Table A7: Ring Population with spline knot at $\tilde{r}/4$

	(1)	(2)	(3)	(4)	(5)
Distance	0.387***	0.384***			
	(0.056)	(0.051)			
Peri × (Distance − $\tilde{\mathbf{r}}$/3)	−0.780***	−0.777***	−0.770***	−0.775***	
	(0.079)	(0.074)	(0.109)	(0.108)	
Peri × Post	0.128**	0.144	0.329***	0.378***	−0.018
	(0.055)	(0.106)	(0.062)	(0.074)	(0.012)
Aff × Peri × Post	−0.545***	−0.545***	−0.534***	−0.832***	−0.057*
	(0.136)	(0.136)	(0.135)	(0.209)	(0.032)
City FE	✓	✓	✓	✓	✓
Year FE		✓	✓	✓	✓
Ring FE			✓	✓	✓
City × Year FE				✓	✓
City × Ring FE					✓
Adj. R^2	0.772	0.772	0.798	0.782	0.997
Num. obs.	13933	13933	13933	13933	13933
Num. clusters (city)	77	77	77	77	77

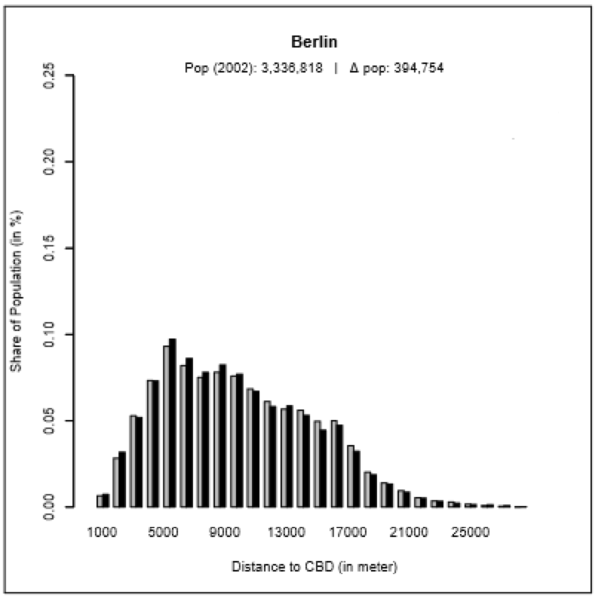
Note: OLS regressions with the logarithm of ring population as the response variable. Clustered standard errors (at city level) in parentheses. Data: full sample of BBSR and KOSTAT cities (see Appendix Table C2). *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

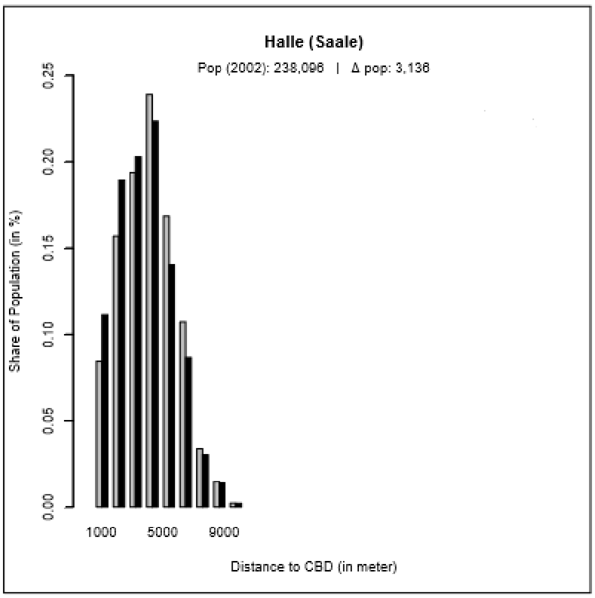
Figures



Appendix Figure A1: Shares α_{11} and α_{12} for Berlin's first two rings

Note: The map illustrates how we intersect administrative districts with city concentric rings, using Berlin as an example. Polygons in the background show Berlin's administrative districts, while the purple-shaded circular area represents the first two rings around Berlin's historic city center (i.e., the city center, as the small red dot). Using GIS techniques, we intersect the area of each district with the ring partition. Any given ring's figures in black show the fraction of the district area falling into that ring. The district's population then is split between rings according to these area shares. Data: Authors' illustration using LOR vector data by Berlin's Administration for Urban Development and Environment.



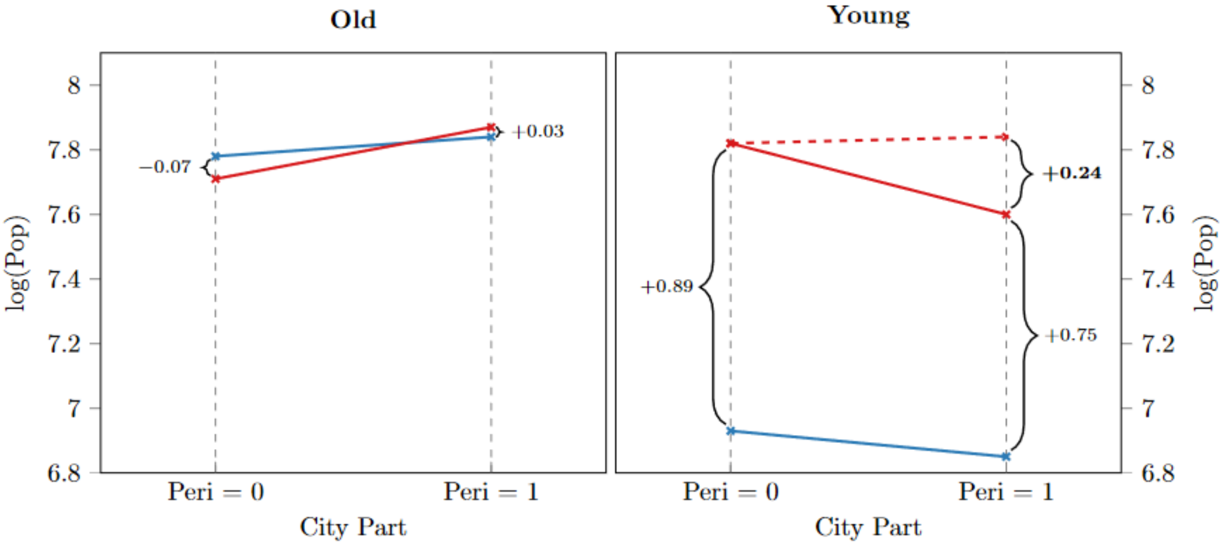


Berlin, 2002–2017

Halle, 2002–2017

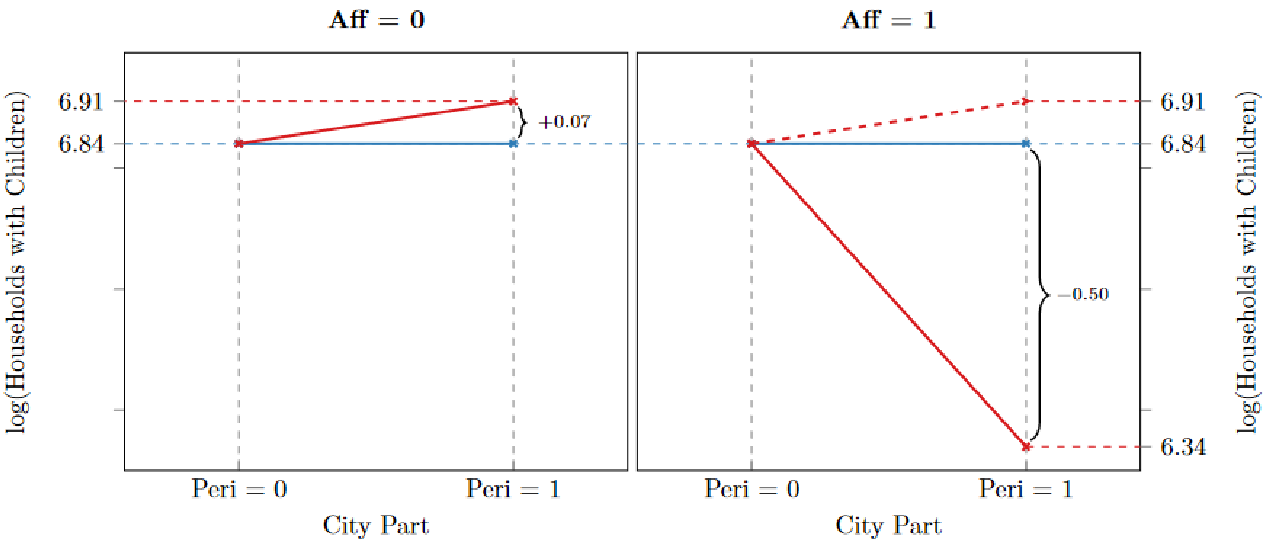
Appendix Figure A2: Two Selected Population Profiles

Note: The panel on the left shows Berlin's population profile, while the panel on the right shows the population profile for the city of Halle. The height of a bar depicts the share of the ring population in total city population at distance *r* from the city center. Gray bars show the ring population share in 2002, while bars in black show the corresponding share for 2017. In both cities, population shares near the city center (city fringe) are greater (smaller) in 2017 than in 2002. Data: Authors' calculations using KOSTAT data.



Appendix Figure A3: Population Gradients for the Old and Young

Note: This figure illustrates the estimates from Table 2. The dotted graphs' slopes show population gradients pre-subsidy repeal, while the solid graphs' slopes indicate population gradients post-repeal. Since the number of Old (the control group, left-hand panel) decreases by 7 log points in any central ring while it increases by 3 log points in any peripheral ring, the population gradient for the old increases by 10 log points. Next, because the number of Young (the treatment group, right-hand panel) increases both in central and peripheral rings, by 89 and 75 log points, respectively, the population gradient for the Young falls by 14 log points. Combining these results, the dashed graph's slope (also in the right-hand panel) gives the counterfactual gradient for the Young had the subsidy not been repealed. Then the population gradient for the Young would be positive, rather than negative, and the number of Young in the periphery would be 24 log points higher than it actually is. Data: Authors' calculations using BBSR data.



Appendix Figure A4: Population Gradients for Affordable and Expensive Cities

Note: This figure shows the results from Table 3, indicating "population gradients" for affordable and less affordable/expensive cities. Dotted lines show these gradients for the period before the subsidy was repealed, solid lines show the gradients after repeal. The number of households with children in expensive cities (control group, left panel) increased by 7 log points in peripheral rings. In contrast, the number of households with children in affordable cities (treatment group, right panel) *decreased* by 50 log points in peripheral rings. Without subsidy repeal, affordable cities would have undergone the same development as expensive ones, meaning households with children would have suburbanized more, rather than less. Data: Authors' calculations using BBSR data.