



# Bombs, homes, and jobs: Revisiting the Oswald hypothesis for Germany



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## HIGHLIGHTS

- We re-examine Oswald's hypothesis that homeownership increases unemployment.
- We exploit WWII bombing of Germany as a source of identification.
- Regional homeownership rates are significantly positively correlated with regional unemployment rates.
- Result holds with year and region fixed effects, instrumentation, and a set of controls.

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## ABSTRACT

Andrew Oswald (1996) hypothesized that homeownership restricts commercial development and labour mobility, increasing unemployment. Instrumenting homeownership with WWII Allied bombing for a German regional panel, we find homeownership has a large positive effect on unemployment, and homeownership decreases labour mobility.

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## 1. Introduction

Andrew Oswald hypothesized that homeownership restricts commercial land development and labour mobility, increasing unemployment (Oswald, 1996; Blanchflower and Oswald, 2013; Lerbs, 2011; Laamanen, 2013). Research on the topic has produced mixed results. We instrument homeownership with WWII Allied strategic bombing, which destroyed housing stocks, leading to state provision of rental housing. We then estimate unemployment equations on 87 German regions over 1998, 2002, and 2006. Reinforcing Lerbs' (2011) OLS estimates, we find that when cor-

rectly identified higher homeownership increases unemployment, and that homeownership decreases labour mobility.

## 2. Data and results

Researchers estimate an equation like:

$$u_{it} = \alpha + \beta \text{own}_{it} + \gamma \mathbf{X}_{it} + \vartheta_t + \pi_i + \mu_{it} \quad (1)$$

where  $u$  is unemployment rate (%) of region  $i$  in year  $t$ ,  $\text{own}$  is homeownership rate (%),  $\mathbf{X}$  controls for  $u$ 's other determinants,  $\vartheta$  and  $\pi$  are region and year fixed effects terms, and  $\alpha$  and  $\mu$  are a constant and error term.

The problem with (1) is that homeownership and labour market conditions are endogenous. We exploit WWII Allied 'area bombing' as an instrument. The United States Army Air Forces (USAAF) and

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**Table 1**  
OLS unemployment rate (%).

	All	All	All
<i>Own</i>	-0.104** [0.036]	0.074** [0.036]	0.105** [0.040]
<i>Population density</i>	-0.002 [0.002]	-0.015 [0.011]	-0.041 [0.017]
<i>High school drops.</i>	0.101** [0.039]	0.035 [0.028]	0.027 [0.062]
<i>Herfindahl</i>	6.933 [11.02]	31.764** [13.904]	32.667 [21.587]
% Age 17–24	0.046 [0.079]	0.246** [0.087]	0.849*** [0.142]
% Age 45–64	0.047 [0.133]	0.039 [0.141]	0.125 [0.143]
<i>Owner<sub>t-1</sub></i>			0.042 [0.049]
<i>Constant</i>	12.198** [5.602]	-1.603 [8.605]	-13.617* [9.899]
Year FE	Yes	Yes	Yes
Region FE	No	Yes	Yes
<i>N</i>	247	247	164
Within-R <sup>2</sup>	0.486	0.595	0.743

Notes: Clustered robust standard errors in brackets.

\*  $p < 0.1$ .  
\*\*  $p < 0.05$ .  
\*\*\*  $p < 0.01$ .**Table 2**  
OLS first-differences unemployment rate (%).

	1 2002	2 2006	3 2006	4 All	5 All
<i>Own</i>	0.009 [0.45]	0.091** [0.039]	0.105** [0.042]	-0.181*** [0.035]	0.071** [0.036]
<i>Population density</i>	-0.014 [0.021]	-0.038** [0.017]	-0.041** [0.017]	-0.027 [0.027]	-0.018 [0.016]
<i>High school drops.</i>	-0.004 [0.060]	0.018 [0.061]	0.027 [0.064]	-0.131** [0.049]	0.047 [0.035]
<i>Herfindahl</i>	-8.639 [18.462]	35.225 [21.16]	32.667 [22.041]	10.159 [22.759]	50.49 [16.69]
% Age 17–24	-0.615 [0.194]	0.841*** [0.146]	0.849*** [0.145]	-0.305** [0.157]	0.310 [0.120]
% Age 45–64	-0.821** [0.404]	0.092 [0.140]	0.125 [0.146]	-0.525** [0.234]	0.147 [0.149]
<i>Owner<sub>t-1</sub></i>			0.042 [0.049]		
<i>Constant</i>	-0.821** [0.345]	2.574*** [0.233]	2.555*** [0.251]	-0.242 [0.216]	-1.608*** [0.172]
Year FE	No	No	No	No	Yes
Region FE	No	No	No	No	No
<i>N</i>	81	83	84	164	164
R <sup>2</sup>	0.299	0.458	0.447	0.291	0.679

Notes: Clustered robust standard errors in brackets.

\*  $p < 0.1$ .  
\*\*  $p < 0.05$ .  
\*\*\*  $p < 0.01$ .

the Royal Air Force (RAF) strategically targeted *civilian* areas to demoralize Germans ('dehousing'). Churchill protested that this would create "... a great shortage of accommodation for ourselves and our Allies... [and] some temporary provision would have to be made for the Germans themselves" (TNA: CAB 120/303). Between October and December 1944, 53% of air attacks targeted cities (Terraine, 1985, 675). All told, 20% of West Germany's housing was destroyed; another 20% damaged (Voigtländer, 2009, 357). Only 43% of Bomber Command's ordnance was expended on *industrial* cities (Bashow, 2014, 32). Vonyo (2012, 107) shows that distance from British airfields determined the extent of bombing.

Along with refugee inflows, this created a 4.5 million home shortage by 1950 (Voigtländer, 2009, 358). Capital scarcity made government intervention necessary. By 1959, 50% of all new houses

**Table 3**  
IV unemployment rate (%).

	OLS Unemp	Second Stage Unemp
<i>Own</i>	0.074** [0.036]	0.536* [0.301]
<i>Population density</i>	-0.015 [0.011]	-0.013 [0.013]
<i>High school drops.</i>	0.035 [0.028]	0.049 [0.056]
<i>Herfindahl</i>	31.764** [13.904]	12.302 [23.91]
% Age 17–24	0.246** [0.087]	0.360 [0.103]
% Age 45–64	0.039 [0.141]	0.404 [0.272]
<i>Constant</i>	-1.603 [8.605]	
Year FE	Yes	Yes
Region FE	Yes	Yes
<i>N</i>	247	250
<i>F-stat.</i>		4.46**
Under-ID		2.96*
Within-R <sup>2</sup>	0.595	0.256

  

	Reduced Form Unemp	First Stage Owners
<i>bomb</i>	-1.08e-07** [4.07e-08]	-1.86e-07** [8.80e-08]
<i>Own</i>	0.068* [0.035]	
<i>Population density</i>	-0.0131 [0.022]	-0.001 [0.027]
<i>High school drops.</i>	0.029 [0.029]	-0.061 [0.084]
<i>Herfindahl</i>	28.919** [13.596]	30.689 [30.405]
% Age 17–24	0.225** [0.082]	-0.149 [0.183]
% Age 45–64	0.084* [0.141]	-0.571** [0.222]
<i>Constant</i>	-2.567 [8.483]	
Year FE	Yes	Yes
Region FE	Yes	Yes
<i>N</i>	247	250
Within-R <sup>2</sup>	0.603	0.340

Notes: Clustered robust standard errors in brackets. *F-stat.* in first stage is Kleibergen–Paap Wald rk *F* statistic. Under-ID is the Angrist–Pischke  $\chi^2$  test.\*  $p < 0.1$ .  
\*\*  $p < 0.05$ .  
\*\*\*  $p < 0.01$ .

were built with public funds (Voigtländer, 2009, 358). Low home-ownership persists because the dwellings are high quality, income limits are generous, and rental market regulation (Voigtländer, 2009, 360).

We aggregated bomb tonnage by region, from the start of area bombing raids in March 1942 to the end of WWII, using Hastings (2013, 328–333) and USSBS (1947, 35, 46). Tonnage data are available for 97 areas, averaging 1.57 units per region. Mean tonnage is 9368 with a standard deviation of 19,901. We interacted these data with the *inverse* number of months from the last raid to our panel's benchmark years, using Hastings (2013, 328–333) and the EAFHS (2014). This IV (*bomb*) captures bombing damage and bombed areas' recovery time. The mean value of months since last raid is 637, with a standard deviation of 7. The IV's coefficient of variation is 2.06.

We use 'Planning Regions' (*Raumordnungsregionen*), which are functional labour markets. Lerbs (2011) provides unemployment and homeownership rate data. The Federal Statistics Office (Destatis, 2014) provides population density (persons per km<sup>2</sup>) to control for employment agglomeration; high-school dropouts (% of high-school graduates) to proxy low-skilled worker shares;

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