

# Bombs, Broadcasts, and Betrayal at the Home Front: Determinants of Treason in Germany during World War II

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# Motivation

- ▶ How to counteract autocratic regimes fighting aggressive wars?
  - ▶ Historically: World Wars, Vietnam, Korea
  - ▶ Contemporary: ISIS, Libya
- ▶ What policies convince people to turn against their governments? How to encourage internal resistance and reduce public support?
  - ▶ bombing
  - ▶ foreign media
- ▶ Internal resistance can shorten the duration of wars and facilitate overthrow of aggressive autocratic leaders

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# Our approach

- ▶ We study resistance, bombing, and radio broadcast in Germany during World War II
  - ▶ deadliest conflict in the history of mankind
- ▶ We use data on treason cases from court records
  - ▶ detailed geographic (Kreis) and time (month) level
- ▶ We use imperfect technology of bombing for identification
  - ▶ bombing in nearby areas as instrument, with location fixed effects
- ▶ We combine data on bombing with detailed data on BBC and German radio reception
  - ▶ based on signal strength, topography-based methodology

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# Preview of Results

1. Panel results – bombing increased resistance
2. This effect is stronger in places with
  - ▶ stronger reception of German radio
  - ▶ weaker reception of BBC radio
3. Cross-section results – both BBC and German radio increased resistance
  - ▶ for German radio the effect is driven by places with low initial level of Nazi support

# Media in Conflicts

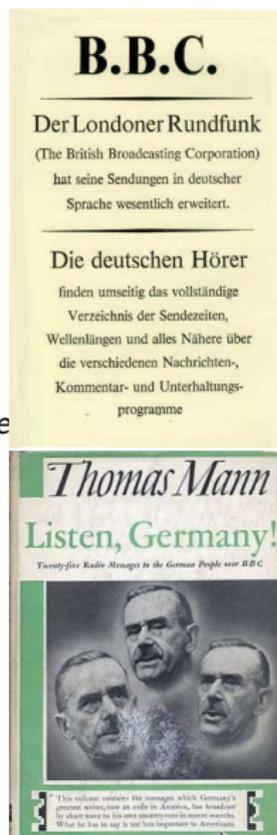
- ▶ BBC German Services: could encourage resistance against the Nazi regime
- ▶ It was perceived as crucial weapon by the UK government, yet
  - ▶ media historians doubt that it played any major role
  - ▶ unique setting: natural field experiment
- ▶ Literature:
  - ▶ No empirical study of foreign media conflict interventions
  - ▶ Adena et al. (QJE, 2015) show that Nazi radio encouraged violence against Jews in late 30's.
  - ▶ Yanagizawa-Drott (QJE, 2014) shows that internal radio propaganda was an important driver of violence against the Tutsi minority in Rwanda.
  - ▶ DellaVigna et al. (AEJ: Applied, 2015): effect of foreign media on post-war reconciliation and nationalism

# Bombing

- ▶ Bombing by Allies continued throughout World War II
  - ▶ Intensified after 1943, when Allies got access to airports in Italy
  - ▶ Dresden bombing being the most famous one
- ▶ Bombing was imperfect
  - ▶ oftentimes, airplanes just drop bombs in a particular and nearby areas
  - ▶ clouds often prevented precise targeting
- ▶ Does bombing encourage or discourage the resistance?
  - ▶ no consensus in historical literature
  - ▶ Dell and Querubin (2016): in Vietnam, bombing had negative effect of bombing on civic insurgency, positive effect on communist insurgency

# BBC German Services

- ▶ Listening forbidden, may be classified as high treason, penalty: prison or even death.
- ▶ Jamming transmitters and sticker actions.
- ▶ Estimated listener numbers:
  - ▶ 1 mil by Gestapo,
  - ▶ 10–15 mil by BBC.
- ▶ BBC 1944: *“Germans listen to London and take seriously what they hear.”*
- ▶ Nobel laureate, Thomas Mann, 1942 *“Hitler is boasting that his Reich is ready for ten, even twenty years of war. I assume that you Germans have your own ideas about that - for example, that after a fraction of this time no stone will stand on top of another in Germany.”*
- ▶ Active encouraging of subversion.



## Data on radio

- ▶ Location of BBC GS transmitters (south-east England) and their power
- ▶ Calculation of signal strength in each district using Irregular Terrain Model, taking topography into account (Hufford 2002; Olken 2009).
- ▶ Predicted shares of population that could receive the BBC.
- ▶ Same for German radio and jamming transmitters.
- ▶ Official statistics on radio subscriptions in Germany.



people's receiver



## Data on resistance

- ▶ Cases of *high treason* dealt before People's Court.
- ▶ Examples: work slowdowns, defeatism, disintegration of defensive capability (Wehrkraftzersetzung).
- ▶ 640 cases with almost 2,000 defendants for 1943–45
- ▶ Timing of resistance (begin, end), type, radio involved or not.
- ▶ Number of people involved in resistance in district  $i$  at time  $t$ .



# Bombing Specification

$$resistance_{im} = \alpha_0 + \alpha_1 Bombing_{im} [+ \alpha_2 Bombing_{im} \times Radio_i] + \mu_i + \phi_m + \varepsilon_{im}$$

- ▶  $resistance_{im}$  total resistance cases, new resistance cases
  - ▶  $Bombing_{im}$  in district  $i$  in month  $m$ 
    - ▶ instrumented by bombing in nearby districts
  - ▶  $\mu_i$  is district fixed effect,  $\phi_m$  is month fixed effect
  - ▶  $Radio_i$  is predicted reception of either BBC or German radio

# Radio Specification

$$resistance_i = \alpha_0 + \alpha_1 Radio\_exposure_i + Z_i' \alpha_2 + \varphi_j + \varepsilon_i$$

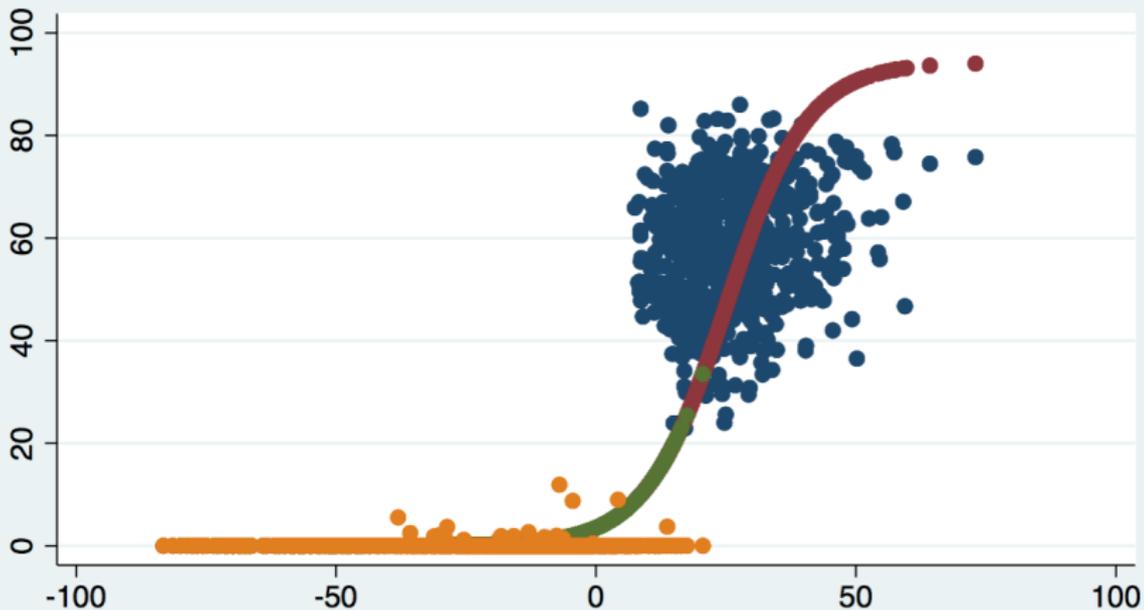
- ▶  $resistance_i$  – total resistance cases or new resistance cases in district  $i$
- ▶  $Radio\_exposure_i$  (for either BBC or German radio) – predicted listenership based signal strength
- ▶  $\varphi_j$  electoral district fixed effects
- ▶  $Z_i$  is a vector of controls
  - ▶ 5th polynomial of population, geography, city status of the district
  - ▶ voting in 1933
  - ▶ Socio-economic controls: census variables, including shares of Jews and Catholics, blue- and white-collar workers, WWI participation

**Table 1. Determinants of Bombing of German territory in 1943-1944.**

VARIABLES	Log (Bombing)							
	1944	1944	1944	1944	1943	1943	1943	1943
BBC Radio Predicted		-0.002 [0.001]	-0.000 [0.002]	-0.000 [0.002]		-0.001 [0.001]	-0.001 [0.001]	-0.001 [0.001]
German Radio Predicted in 1933	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000 [0.001]
German Radio Predicted		-0.859 [4.041]	-2.524 [3.873]	-2.512 [3.874]		0.465 [1.806]	0.276 [2.052]	0.269 [2.028]
NSDAP vote share in 1933		0.073 [0.054]	0.121* [0.066]	0.127* [0.067]		-0.040 [0.062]	-0.026 [0.061]	-0.029 [0.066]
Share of Jewish population, 1925		-0.056 [0.161]	-0.055 [0.168]	-0.054 [0.169]		-0.009 [0.046]	0.011 [0.054]	0.011 [0.054]
Share of Catholic population, 1925		2.205*** [0.404]	2.330*** [0.456]	2.338*** [0.453]		0.328*** [0.120]	0.146 [0.253]	0.141 [0.258]
Share of blue-collar workers, 1925			0.008 [0.006]	0.008 [0.006]			0.003 [0.002]	0.003 [0.002]
Share of white-collar workers, 1925			-0.027 [0.072]	-0.028 [0.072]			0.042 [0.054]	0.043 [0.054]
War participatnts per 1000			-0.000*** [0.000]	-0.000** [0.000]			-0.000 [0.000]	-0.000 [0.000]
City (Stadtkreis)				0.003 [0.009]				-0.002 [0.005]
Altitude	-0.011 [0.012]	-0.012 [0.015]	-0.011 [0.014]	-0.011 [0.014]	0.000 [0.003]	0.003 [0.003]	0.003 [0.003]	0.003 [0.003]
Population controls	Yes***	Yes***	Yes***	Yes***	Yes	Yes	Yes	Yes
Region(Wahlkreis) Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,024	938	924	924	1,024	938	924	924
R-squared	0.197	0.293	0.310	0.310	0.274	0.307	0.311	0.311

**Table 2. Determinants of BBC radio reception in Germany in 1943-1944.**

VARIABLES	Predicted Share of BBC listeners						
German Radio Predicted	0.012** [0.005]	0.014** [0.006]	0.013** [0.005]	0.012** [0.005]	0.012** [0.005]	0.012** [0.005]	0.006 [0.004]
NSDAP vote share in 1933			-0.003 [0.005]	0.012 [0.012]	0.011 [0.012]	0.009 [0.013]	0.013 [0.012]
Share of Jewish population, 1925				8.663 [17.840]	10.792 [17.772]	12.509 [17.322]	12.819 [17.410]
Share of Catholic population, 1925				0.843 [0.785]	0.777 [0.775]	0.703 [0.844]	0.904 [0.794]
Share of blue-collar workers, 1925				1.569 [1.067]	1.609 [1.062]	1.549 [1.090]	1.542 [1.087]
Share of white-collar workers, 1925				-0.137 [1.318]	-0.04 [1.299]	0.061 [1.848]	0.349 [1.885]
War participatnts per 1000					-0.07 [0.043]	-0.069 [0.043]	-0.065 [0.041]
City (Stadtkreis)						-0.027 [0.295]	-0.057 [0.285]
Altitude						0 [0.001]	0.001 [0.001]
German Radio Predicted in 1933							0.097 [0.069]
Population controls		Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,024	938	924	924	1,024	938	924
R-squared	0.197	0.293	0.310	0.310	0.274	0.307	0.311



- Listenership, German radio, 1940
- Predicted Listenership, German radio, 1940
- Predicted Listenership, BBC, 1942
- BBC mentioned in treason cases

**Table 3. Monthly bombing and bombing of neighbors. First stage for Fixed Effects Regression**

VARIABLES	Log (Bombing)						
Bombing of others, 3 months before	-0.007 [0.008]						
Bombing of others, 2 months before		0.006 [0.009]					
Bombing of others, 1 month before			0.019* [0.009]				
Bombing of others, 3 months before				0.073*** [0.013]			
Bombing of others, 1 month later					0.006 [0.007]		
Bombing of others, 2 months later						-0.004 [0.006]	
Bombing of others, 3 months later							-0.011 [0.009]
District (Kreis) Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,544	11,544	11,544	11,544	11,544	11,544	11,544
R-squared	0.301	0.301	0.302	0.311	0.301	0.301	0.301
F-statistics	0.892	0.443	4.116	34.17	0.708	0.439	1.500

**Table 4. Monthly bombing and Resistance Cases. Second stage for Fixed Effects Regression**

VARIABLES	Log (Resistance Cases)						Log (New Resistance Cases)					
Bombing of others, 3 months before	0.033* [0.020]						0.007 [0.007]					
Bombing of others, 2 months before	0.039* [0.022]						0.023** [0.010]					
Bombing of others, 1 month before	0.036 [0.022]						0.010 [0.009]					
Bombing of others, 3 months before	0.019 [0.022]						0.006 [0.010]					
Bombing of others, 1 month later	0.016 [0.021]						-0.005 [0.014]					
Bombing of others, 2 months later	-0.008 [0.024]						-0.003 [0.011]					
District (Kreis) Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,544	11,544	11,544	11,544	11,544	11,544	11,544	11,544	11,544	11,544	11,544	11,544
Number of districts	481	481	481	481	481	481	481	481	481	481	481	481
F-statistics	60.54	46.65	42.88	45.88	40.70	43.15	60.54	46.65	42.88	45.88	40.70	43.15

**Table 5. Monthly bombing, Radio, and Resistance Cases. Second stage for Fixed Effects Regression**

VARIABLES	Log (Resistance Cases)					
	same month	1 month later	2 months later	3 months later	4 months later	5 months later
Log (Bombing)	0.035 [0.023]	0.043* [0.024]	0.044* [0.026]	0.024 [0.022]	0.025 [0.021]	0.010 [0.025]
Log (Bombing)*BBC Radio Predicted	0.003** [0.001]	0.006** [0.003]	0.002 [0.005]	0.007*** [0.002]	0.006* [0.003]	0.004* [0.002]
Log (Bombing)*German Radio Predicted	-0.001* [0.001]	-0.001** [0.001]	-0.001** [0.001]	-0.002** [0.001]	-0.002** [0.001]	-0.002*** [0.001]
District (Kreis) Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,544	11,544	11,544	11,544	11,544	11,544
Number of districts	481	481	481	481	481	481
F-statistics	19.40	16.57	14.42	15.11	11.92	12.64

**Table 6 . Resistance and Radio, cross-section, 1943-1944.**

VARIABLES	Log (Resistance), 1943-1944						
BBC Radio Predicted	-0.0014 [0.0009]	0.0004 [0.0009]	0.0020* [0.0012]	0.0021* [0.0012]	0.0021* [0.0012]	0.0021* [0.0012]	0.0020* [0.0011]
German Radio Predicted	0.0007*** [0.0002]	0.0003** [0.0001]	0.0003** [0.0001]	0.0003** [0.0001]	0.0003** [0.0001]	0.0003** [0.0001]	0.0002 [0.0002]
NSDAP vote share in 1933			-0.0004** [0.0002]	-0.0005 [0.0003]	-0.0005 [0.0003]	-0.0005 [0.0004]	-0.0005 [0.0004]
Share of Jewish population, 1925				0.0936 [0.2753]	0.0842 [0.2721]	0.1503 [0.2584]	0.1538 [0.2589]
Share of Catholic population, 1925				-0.0071 [0.0097]	-0.0072 [0.0098]	-0.0109 [0.0140]	-0.0092 [0.0141]
Share of blue-collar workers, 1925				0.0017 [0.0184]	0.0008 [0.0183]	-0.0040 [0.0279]	-0.0040 [0.0278]
Share of white-collar workers, 1925				-0.0136 [0.0402]	-0.0149 [0.0410]	0.0130 [0.1049]	0.0154 [0.1055]
War participatnts per 1000					0.0004 [0.0011]	0.0005 [0.0011]	0.0005 [0.0011]
City (Stadtkreis)						-0.0067 [0.0198]	-0.0070 [0.0197]
Altitude						0.0000 [0.0000]	0.0000 [0.0000]
German Radio Predicted in 1933							0.0008 [0.0015]
Population controls		Yes	Yes	Yes	Yes	Yes	Yes
Region(Wahlkreis) Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,024	1,024	940	938	924	924	924
R-squared	0.6455	0.7394	0.7446	0.7447	0.7447	0.7449	0.7450

**Table 7 . Resistance, radio, and predispositions, 1943-1944.**

VARIABLES	Log (Resistance), 1943-1944					
BBC Radio Predicted	-0.0028 [0.0037]	0.0009 [0.0039]	0.0012 [0.0037]	0.0013 [0.0037]	0.0012 [0.0037]	0.0012 [0.0037]
BBC Radio Predicted * NSDAP vote share in 1933	0.0000 [0.0001]	0.0000 [0.0001]	0.0000 [0.0001]	0.0000 [0.0001]	0.0000 [0.0001]	0.0000 [0.0001]
German Radio Predicted	0.0026*** [0.0008]	0.0015** [0.0006]	0.0015** [0.0006]	0.0015** [0.0006]	0.0016** [0.0007]	0.0016** [0.0007]
German Radio Predicted * NSDAP vote share in 1933	-0.00004*** [0.00001]	-0.00003** [0.00001]	-0.00003** [0.00001]	-0.00003** [0.00001]	-0.00003** [0.00001]	-0.00003** [0.00001]
NSDAP vote share in 1933	-0.0009*** [0.0003]	-0.0005** [0.0002]	-0.0006* [0.0003]	-0.0006* [0.0003]	-0.0007* [0.0004]	-0.0007* [0.0004]
Share of Jewish population, 1925			0.1027 [0.2795]	0.0960 [0.2755]	0.1957 [0.2622]	0.1960 [0.2615]
Share of Catholic population, 1925			-0.0055 [0.0092]	-0.0054 [0.0093]	-0.0109 [0.0129]	-0.0107 [0.0134]
Share of blue-collar workers, 1925			-0.0013 [0.0174]	-0.0021 [0.0174]	-0.0096 [0.0267]	-0.0096 [0.0267]
Share of white-collar workers, 1925			-0.0079 [0.0385]	-0.0082 [0.0392]	0.0358 [0.1015]	0.0360 [0.1019]
War participatnts per 1000				0.0002 [0.0011]	0.0003 [0.0010]	0.0003 [0.0010]
City (Stadtkreis)					-0.0105 [0.0195]	-0.0105 [0.0195]
Altitude					0.0000 [0.0000]	0.0000 [0.0000]
German Radio Predicted in 1933						0.0001 [0.0015]
Population controls		Yes	Yes	Yes	Yes	Yes
Region(Wahlkreis) Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	940	940	938	924	924	924
R-squared	0.6552	0.7468	0.7468	0.7468	0.7472	0.7472

# Conclusions

- ▶ Both bombing and media can promote internal resistance
  - ▶ more effective together
- ▶ Different information environment might explain different effectiveness of bombing
- ▶ Contrary to popular perception, foreign media campaigns might help to fight aggressive authoritarian regimes at war