

Tax incentives, bequest motives, and the demand for life insurance: Evidence from two natural experiments in Germany*

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Abstract: Whole life insurance plays an important role in household saving. However, empirical evidence on its determinants is scarce. This paper studies two natural experiments to identify the effects of tax incentives and bequest motives on life-insurance demand. An unanticipated tax reform in 2000 halved the tax exemption limit for capital income in Germany. We document that the demand for life insurance reacted strongly to this change. With regard to bequest motives, we analyze the demand for life insurance in the former German Democratic Republic (GDR). Relative to market-based economies, the socialist GDR can be viewed as an experimental institutional setting where life-insurance demand was not influenced by tax considerations which allows us to isolate bequest motives while controlling for life-cycle and precautionary motives. We find a significantly higher ownership probability among households with children and a high regard for the family, confirming bequest motives in life-insurance demand.

Keywords: savings, life insurance, capital income taxation, bequests

JEL classification: D91; C25; D14; G11

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Figures and tables

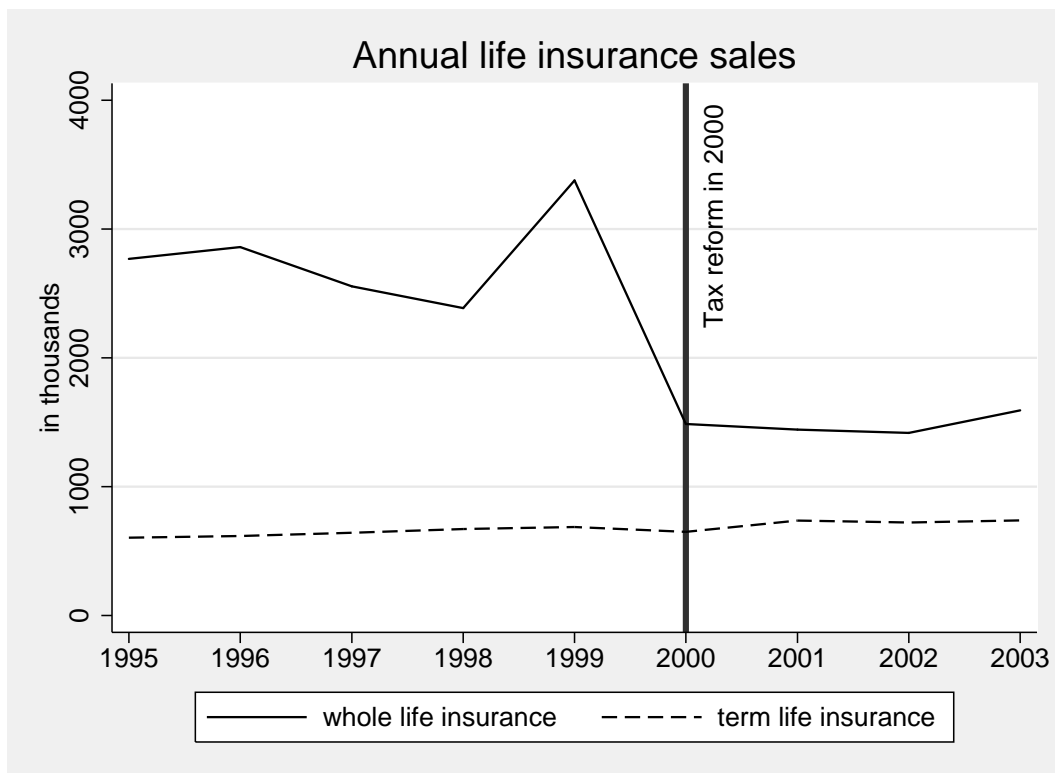


Figure 1: The graph depicts sales of new life insurance contracts in 2007 in Germany. Source: Gesamtverband der Deutschen Versicherungswirtschaft (2008).

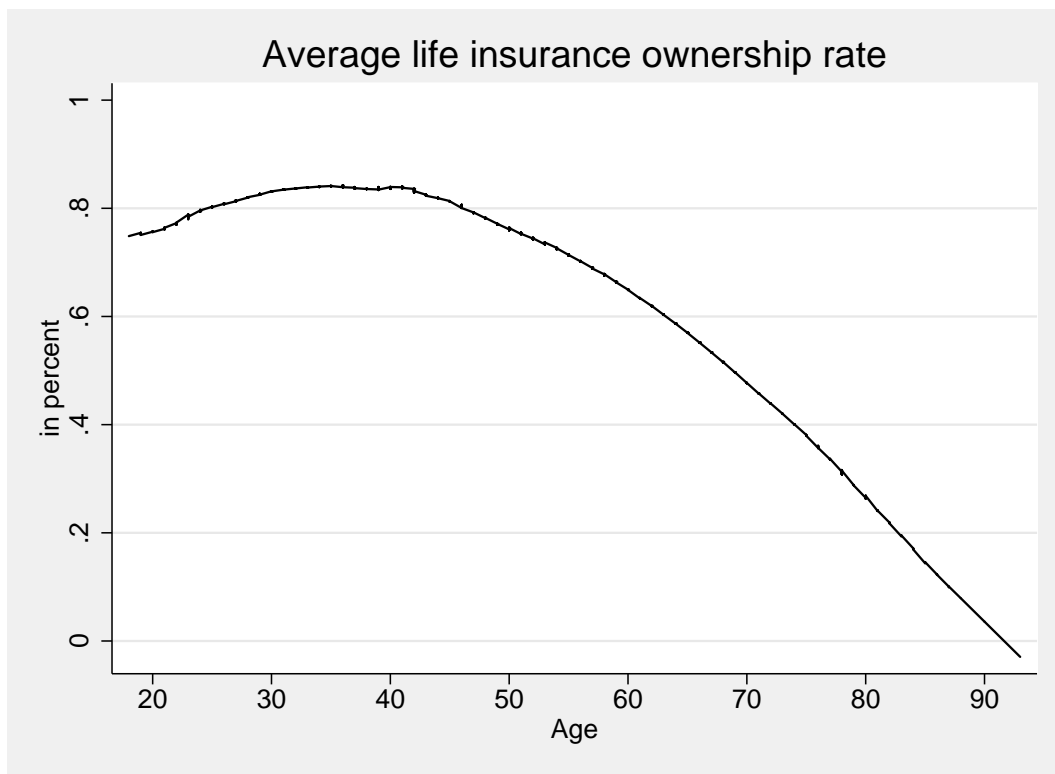


Figure 2: The graph depicts the (smoothed) average life insurance ownership rate in East Germany, 1990. Source: GSOEP.

Table 1: Tax exemption limits on capital income

Period	Exemption limit on capital income		Treatment group [exact]		Treatment group [categorical]	
			$limit^{new}-limit^{old}$		$\widetilde{limit}^{new}-\widetilde{limit}^{old}$	
1996-1999						
single	6000	DM	3,000-6,000	DM	2,000-5,000	DM
(couple)	(12,000)		(6,000-12,000)		(5,000-10,000)	
2000-2001						
single	3000	DM	3,000-6,000	DM	2,000-5,000	DM
(couple)	(12,000)		(6,000-12,000)		(5,000-10,000)	

Note: The table reports the development of tax exemption limits on capital income in Germany for singles (married couples). The thresholds for the old and new exemption limits, $limit^{old}$ and $limit^{new}$, define the upper and lower bounds of the treatment group and are either assigned by exact or categorical (indicated by tilde) interest and dividend returns.

Table 2: Tax incentives - average ownership rates 1996-2001

<i>as a % of all observations in the subpopulation</i>						
	1996	1997	1998	1999	2000	2001
Full sample	54.72	55.79	54.56	55.29	54.67	52.38
<i>N</i>	6,594	6,383	7,159	6,980	11,662	11,193
$INC^{CAP} < limit^{new}$	54.28	55.52	54.20	54.48	54.09	51.85
<i>N</i>	6,278	6,092	6,816	6,533	10,959	10,703
$INC^{CAP} > limit^{old}$	64.84	67.71	60.36	62.58	63.11	62.29
<i>N</i>	91	96	111	163	225	175
$limit^{new} < INC^{CAP} < limit^{old}$	62.67	58.46	62.50	69.72	64.02	65.08
<i>N</i>	225	195	232	284	478	315

Note: The table reports average ownership rates of life insurance policies for different subpopulations. INC^{CAP} denotes total capital income.

Table 3: Tax incentives - Difference-in-Differences

	treated	non-treated	Difference between groups	N
<i>Effect of the tax reform.</i>				
N	1,729	47,961		49,690
After the reform (1999-2001)	0.658 (0.014)	0.536 (0.003)	0.123 (0.015)	29,554
Before the reform (1996-1999)	0.613 (0.019)	0.548 (0.004)	0.066 (0.020)	20,136
Difference within groups	0.045 (0.024)	-0.012 (0.005)	0.057 (0.000)	
<i>Effect of the tax reform, $INC^{CAP} > limit^{new}$.</i>				
N	1,729	861		2,590
After the reform (1999-2001)	0.658 (0.014)	0.627 (0.020)	0.031 (0.025)	1,640
Before the reform (1996-1999)	0.613 (0.028)	0.641 (0.019)	-0.028 (0.034)	950
Difference within groups	0.045 (0.024)	-0.014 (0.035)	0.059 (0.001)	

Note: The upper panel reports average ownership rates of life insurance policies for the years 1996-2001. The bottom panel reports averages for all households with a capital income $INC^{CAP} > limit^{new}$. The difference-in-difference estimate is reported in bold face in the bottom right cell of each panel. Standard errors are reported in parentheses.

Table 4: Tax incentives - summary statistics

		full sample	$INC^{CAP} >$ $limit^{new}$
marginal tax rate		0.249	0.338
woman	D	0.376	0.277
age		48.87	52.39
children	D	0.340	0.218
married	D	0.829	0.730
10 years schooling	D	0.280	0.250
13 years schooling	D	0.200	0.424
college	D	0.086	0.132
university	D	0.100	0.240
self-employed	D	0.057	0.136
civil servant	D	0.045	0.070
retired	D	0.283	0.320
unemployed	D	0.078	0.035
Hhold income decile 1	D	0.099	0.026
Hhold income decile 2	D	0.103	0.039
Hhold income decile 3	D	0.097	0.054
Hhold income decile 4	D	0.101	0.070
Hhold income decile 6	D	0.111	0.100
Hhold income decile 7	D	0.097	0.078
Hhold income decile 8	D	0.097	0.111
Hhold income decile 9	D	0.099	0.174
Hhold income decile 10	D	0.094	0.284
owns house	D	0.405	0.632
returns < 2,000 DM	D	0.231	
returns < 5,000 DM	D	0.084	
returns < 10,000 DM	D	0.033	
returns > 10,000 DM	D	0.016	
N		44,540	2,419
Sample years		1996-2001	1996-2001

Note: The samples are from the GSOEP. Demographic variables refer to the household head. Dummy variables are marked by D.

Table 5: Tax incentives - average marginal effects

		(1)		(2)	
		full sample		$INCCAP > limit^{new}$	
		estimate	st.error	estimate	st.error
$\hat{\tau}^{DiD}$	D	0.052**	(0.024)	0.089**	(0.046)
T	D	0.010	(0.006)	-0.040	(0.037)
G	D	-0.006	(0.021)	-0.057	(0.036)
marginal tax rate		0.329***	(0.026)	0.250***	(0.089)
woman	D	0.003	(0.008)	-0.075**	(0.031)
age/10		0.153***	(0.017)	0.102*	(0.056)
(age/10) ²		-0.021***	(0.002)	-0.017***	(0.005)
children	D	-0.000	(0.009)	0.033	(0.035)
married	D	0.062***	(0.012)	0.099***	(0.037)
10 years schooling	D	0.059***	(0.009)	-0.037	(0.035)
13 years schooling	D	0.003	(0.012)	-0.096***	(0.036)
college	D	0.005	(0.014)	0.048	(0.039)
university	D	-0.024	(0.015)	-0.002	(0.040)
self-employed	D	0.044***	(0.014)	0.020	(0.041)
civil servant	D	0.025	(0.018)	-0.002	(0.048)
retired	D	-0.008	(0.013)	-0.078*	(0.044)
unemployed	D	-0.022**	(0.011)	0.031	(0.057)
Hhold income decile 1	D	-0.173***	(0.014)	-0.035	(0.084)
Hhold income decile 2	D	-0.082***	(0.013)	0.060	(0.063)
Hhold income decile 3	D	-0.068***	(0.013)	-0.018	(0.061)
Hhold income decile 4	D	-0.040***	(0.011)	0.029	(0.051)
Hhold income decile 6	D	0.023**	(0.011)	0.047	(0.047)
Hhold income decile 7	D	0.030**	(0.012)	0.054	(0.050)
Hhold income decile 8	D	0.039***	(0.012)	0.045	(0.048)
Hhold income decile 9	D	0.044***	(0.013)	0.075	(0.046)
Hhold income decile 10	D	0.068***	(0.014)	0.156***	(0.041)
owns house	D	0.071***	(0.008)	0.057*	(0.029)
returns < 2,000 DM	D	0.080***	(0.007)		
returns < 5,000 DM	D	0.034***	(0.011)		
returns < 10,000 DM	D	0.030*	(0.016)		
returns > 10,000 DM	D	0.039	(0.026)		
<i>Suppressed: year dummies, constant.</i>					
N		44,540		2,419	
Pseudo-R2		0.171		0.209	
χ^2 (prob.)		3,249.2 (0.000)		275.9 (0.000)	
Sample years		1996-2001		1996-2001	

D indicates dummy variables. Average marginal effects are reported. Robust and clustered standard errors are reported in parentheses. ***, **, * indicate significance at the 0.01, 0.05, 0.1 level.

Table 6: Bequest motives - summary statistics

	subsamples		All observations			
	owner	non-owner	Mean	Std. Dev.	Min	Max
	Mean	Mean				
age	43.2	53.5	46.1	15.9	17	93
woman	0.50	0.55	0.51	0.50	0	1
married	0.77	0.53	0.70	0.46	0	1
10 years schooling	0.48	0.34	0.44	0.50	0	1
13 years schooling	0.15	0.13	0.14	0.35	0	1
master craftsman	0.08	0.07	0.08	0.27	0	1
college	0.20	0.17	0.19	0.39	0	1
university	0.10	0.10	0.10	0.30	0	1
returns < 200 Mark	0.24	0.21	0.23	0.42	0	1
returns < 500 Mark	0.24	0.23	0.24	0.43	0	1
returns < 1,000 Mark	0.13	0.09	0.12	0.33	0	1
returns > 1,000 Mark	0.06	0.08	0.06	0.24	0	1
Hhold income/10,000	0.18	0.13	0.17	0.07	0.03	0.51
partner no job	0.09	0.16	0.11	0.32	0	1
partner income diff./1,000	0.39	0.26	0.35	0.43	0	3.63
retired	0.10	0.38	0.17	0.38	0	1
self-employed	0.03	0.02	0.02	0.15	0	1
civil servant	0.31	0.19	0.27	0.45	0	1
owns house	0.30	0.24	0.29	0.45	0	1
owns weekend house	0.17	0.11	0.15	0.36	0	1
no car	0.36	0.56	0.42	0.49	0	1
motorbike	0.42	0.23	0.37	0.48	0	1
children	0.54	0.28	0.47	0.50	0	1
one child	0.25	0.14	0.22	0.42	0	1
two children	0.24	0.12	0.20	0.40	0	1
three children +	0.05	0.02	0.04	0.20	0	1
family very important	0.89	0.74	0.85	0.36	0	1
unsatisfied social benefits	0.56	0.54	0.55	0.50	0	1
security consciousness	8.83	8.75	8.81	1.83	0	10
Health satisfaction	6.80	6.25	6.65	2.64	0	10
classical concerts, theatre	0.13	0.11	0.12	0.32	0	1
pop concerts, movies, discos	0.13	0.16	0.15	0.36	0	1
active sports	0.14	0.15	0.14	0.35	0	1
meet friends, neighbors	0.58	0.66	0.64	0.48	0	1
help friends, neighbors	0.40	0.49	0.46	0.50	0	1
attend church services	0.11	0.07	0.08	0.28	0	1
N	1487	562	2049			

Note: The sample is the 1990 GSOEP for East Germany. Demographic variables refer to the household head.

Table 7: Bequest motives - average marginal effects

		(3)	(4)	(5)	(6)	(7)
						only <65
age/10		0.165*** (0.041)	0.165*** (0.041)	0.168*** (0.042)	0.167*** (0.042)	0.048 (0.069)
(age/10) ²		-0.019*** (0.004)	-0.019*** (0.004)	-0.019*** (0.004)	-0.019*** (0.004)	-0.004 (0.008)
woman	D	0.041** (0.020)	0.041** (0.020)	0.037* (0.020)	0.045** (0.020)	0.031 (0.020)
married	D	0.024 (0.028)	0.025 (0.028)	0.013 (0.028)	0.025 (0.028)	0.010 (0.028)
10 years schooling	D	-0.006 (0.026)	-0.006 (0.026)	-0.001 (0.027)	-0.006 (0.026)	-0.003 (0.028)
13 years schooling	D	-0.000 (0.043)	-0.000 (0.043)	0.002 (0.043)	0.007 (0.043)	-0.007 (0.044)
master craftsman	D	0.034 (0.036)	0.034 (0.036)	0.027 (0.037)	0.036 (0.036)	-0.003 (0.040)
college	D	-0.046* (0.027)	-0.046* (0.027)	-0.049* (0.027)	-0.042 (0.027)	-0.041 (0.028)
university	D	-0.101** (0.049)	-0.100** (0.049)	-0.095* (0.049)	-0.096* (0.049)	-0.088* (0.051)
returns < 200 Mark	D	0.021 (0.024)	0.021 (0.024)	0.023 (0.024)	0.021 (0.024)	0.012 (0.025)
returns < 500 Mark	D	0.016 (0.024)	0.016 (0.024)	0.019 (0.024)	0.019 (0.024)	0.017 (0.025)
returns < 500 Mark	D	0.070** (0.029)	0.069** (0.029)	0.071** (0.029)	0.072** (0.029)	0.063** (0.028)
returns > 1,000 Mark	D	-0.075 (0.046)	-0.075* (0.046)	-0.078* (0.046)	-0.069 (0.046)	-0.099** (0.050)
Hhold income/10,000	D	2.102*** (0.532)	2.106*** (0.533)	1.776*** (0.539)	2.115*** (0.530)	2.054*** (0.564)
(Hhold income/10,000) ²		-3.919*** (1.249)	-3.927*** (1.250)	-3.119** (1.268)	-3.938*** (1.241)	-3.613*** (1.299)
partner no job		-0.006 (0.031)	-0.007 (0.031)	-0.006 (0.032)	-0.005 (0.031)	0.005 (0.039)
partner income diff./1000	D	0.022 (0.024)	0.022 (0.024)	0.022 (0.024)	0.022 (0.024)	0.021 (0.024)
retired		-0.045 (0.046)	-0.044 (0.046)	-0.053 (0.047)	-0.053 (0.046)	0.036 (0.056)
self-employed	D	0.023 (0.059)	0.023 (0.059)	0.018 (0.059)	0.028 (0.058)	0.026 (0.056)
civil servant	D	0.027 (0.022)	0.026 (0.022)	0.025 (0.022)	0.027 (0.022)	0.017 (0.021)

... Table 7 continued ...

		(3)	(4)	(5)	(6)	(7) only <65
owns house	D	0.016 (0.022)	0.016 (0.022)	0.015 (0.022)	0.013 (0.022)	0.024 (0.023)
owns weekend house	D	0.023 (0.026)	0.023 (0.026)	0.023 (0.026)	0.021 (0.026)	0.037 (0.025)
no car	D	0.012 (0.022)	0.011 (0.022)	0.009 (0.022)	0.011 (0.022)	0.007 (0.022)
motorbike	D	0.058*** (0.021)	0.058*** (0.021)	0.059*** (0.021)	0.057*** (0.021)	0.056*** (0.021)
children	D	0.070*** (0.025)		0.063** (0.026)	0.070*** (0.026)	0.071*** (0.026)
one child	D		0.080*** (0.029)			
two children	D		0.068** (0.032)			
three children +	D		0.071 (0.054)			
family very important	D			0.070** (0.028)		0.077** (0.033)
unsatisfied social benefits	D			-0.006 (0.018)		0.006 (0.019)
security conscious				0.001 (0.005)		-0.001 (0.005)
health satisfaction				-0.000 (0.004)		0.001 (0.004)
classical concerts, theatre	D				-0.038 (0.031)	
pop concerts, movies, discos	D				0.017 (0.028)	
active sports	D				-0.036 (0.028)	
meet friends, neighbors	D				0.025 (0.020)	
help friends, neighbors	D				0.018 (0.019)	
attend church services	D				-0.023 (0.035)	
N		2,049	2,049	2,024	2,049	1,715
Pseudo-R2		0.145	0.145	0.145	0.148	0.064
χ^2		306.4	306.3	300.1	307.7	107.0
p		0.000	0.000	0.000	0.000	0.000
AIC		2,108.8	2,112.7	2,082.5	2,114.2	1,689.6
BIC		2,249.5	2,264.6	2,245.2	2,288.6	1,847.6

D indicates dummy variables. Average marginal effects are reported. Standard errors are reported in parentheses. ***, **, * indicate significance at the 0.01, 0.05, 0.1 level.