The Effect of German Reunification on Tax Morale & the Influence of Preferences for Income Equality and Government Responsibility

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Large-scale social surveys, such as the World Values Survey, have made empirical analysis of individual-level social capital measures a more promising avenue for policy analysis. Recent work has recognized the beneficial effects of social trust on aggregate economic performance by reducing transaction costs. One such mechanism involves individual willingness to fulfill pecuniary obligations, such as paying taxes. This trait—referred to as tax morale—has obvious implications for public policy and administration. Ordinary least squares (OLS) and ordered probit regression are used with data from two waves of the World Values Survey, from 1990 and 1997, to estimate a model that relates individual tax morale to the change in form of government and measures of two individual preferences that are plausibly relevant to tax morale. Using the 1990 reunification of East and West Germany as a natural experiment, this study investigated whether the shift to an arguably more representative form of government is associated with a change in the relationship between tax morale and preferences regarding income inequality and government responsibility for individual welfare. The estimated impact of the change in government on tax morale is statistically and substantively significant, ceteris paribus. The relationship between tax morale and the preference measures is statistically modest and substantively negligible. However, the effect of the change in government on tax morale is found to differ substantively and statistically for individuals who prefer varying levels of government responsibility.

Introduction

Effective public administration is dependent on the collection of taxes; the broad participation of a citizenry in the financial support of their central government is widely seen as important for social cohesion. [1] Thus, tax collection is a requirement of the social contract that binds individuals to one another through their common support for public institutions.[2] Although regulations compel tax payment, actual compliance is also a function of individual traits and attitudes,[3] which in turn have been shown to depend on social and cultural norms.[4, 5] In addition, the direct analysis of compliance is encumbered by the difficulty of obtaining data on illegal and, hence, hidden activity.

Citizens pay taxes to support government and the services it delivers. It is reasonable to expect that high-quality government would positively affect individuals' intrinsic motivation to pay taxes—the characteristic known as tax morale—both directly and through underlying social norms.[6, 7] The objective of the present work is to investigate the relationship between tax morale, change in the form of national governance, and measures of two individual attitudes that are plausibly relevant to tax morale: preference regarding income inequality and preference regarding government responsibility for individual welfare.

West Germany can serve as a suitable comparison case for East Germany due to the broad similarity between the populations of East and West Germany, relative to broader cross-national comparisons, with regard to language, education systems, and the cultural and political history shared prior to the post-World War II division.[8, 9] Consequently, the 1990 reunification of Germany offers researchers a chance to investigate the impact of form of government on tax morale in a setting that is close to a natural experiment. This circumstance, together with the availability of individual-level data from surveys of randomly sampled individuals immediately prior to the reunification in 1990 and after it in 1997, allow a pre-test–post-test comparison group research design to be implemented as a regression-based difference-in-difference design with statistical controls.[10, 11]

1 This article benefited greatly from suggestions offered by Professor Laura Langbein, American University. All errors remain my own.

2 Daude, Gutiérrez, & Melguizo, "What Drives Tax Morale?" OECD Development Centre, Working Paper No. 315 (2012).

3 Cummings, et al., "Tax Morale Affects Tax Compliance: Evidence from Surveys and an Artefactual Field Experiment." *Journal of Economic Behavior & Organization* 70(3) (2009): 447–457.

4 Elster, "Social Norms and Economic Theory." *Journal of Economic Perspective*, 3 (1989): 99–117.

5 Naylor, "Strikes, Free Riders, and Social Consensus." *Quarterly Journal of Economics* 104, (1989): 771–786.

6 Cummings, et al., "Tax Morale Affects Tax Compliance."

7 Dabla-Norris et al, "What Causes Firms to Hide Output? The Determinants of Informality." *Journal of Development Economics* 85(1-2) (2008): 1–27.

8 Alm & Torgler, "Culture Differences and Tax Morale in the United States and in Europe." *Journal of Economic Psychology* 27(2) (2006): 224–246.

9 Feld & Torgler, "Tax Morale after the Reunification of Germany: Results from a Quasi-Natural Experiment." Berkeley Program in Law and Economics, Working Paper Series. (2007).

10 Cameron & Trivedi, *Microeconometrics: methods and applications*. Cambridge university press, 2005, 768.

11 Meyer, "Natural and Quasi-Experiments in Economics." *Journal of Business & Economic Statistics*

Background

It has long been recognized that actual tax compliance exceeds levels predicted by neoclassical economic theory.[12] This has led many researchers to conclude that compliance is driven by internalized norms.[13] Now, large-scale social surveys such as the World Values Survey (WVS)[14] make the empirical analysis of individual-level measures of social capital a more promising avenue for investigating norms. In the past decade, research focused on the correlates of generalized trust has led to a growing acceptance of the exogeneity and reliability of this measure.[15] Recent work has recognized the general potential for social trust to improve aggregate economic performance by reducing transaction costs.[16] Tax morale is one such beneficial mechanism.[17] Cummings et al.[18] used artefactual field experiments to investigate citizen assessments of political history and the quality of governance in the relationship between tax morale and tax compliance. Additionally, Halla[19] exploited exogenous variation in tax morale related to immigration in order to seek evidence of tax morale's causal impact on the size of underground economic activity.

Following strong indications that individual attitudes are fundamental to behavioral drivers such as tax morale, a body of work has developed that investigates the causes and effects of attitudes regarding economic issues other than the payment of taxes, such as income inequality[20, 21, 22, 23] and the tension between individual and collective responsibility for the well-being of citizens.[24,25,26]

13, no. 2 (April 1, 1995): 151–161.

12 Alm et al, "Why Do People Pay Taxes?" *Journal of Public Economics* 48(1) (1992): 21–38.

13 Posner, "Law and Social Norms: The Case of Tax Compliance." *Virginia Law Review* 86(8) (2000): 1781–1819.

14 World Values Survey Association. European and World Values Surveys Four-Wave Integrated Data File, 1981–2004, v.20060423, 2006.

15 Halla, "Tax Morale and Compliance Behavior: First Evidence on a Causal Link." Discussion Paper No. 4918. Bonn: IZA (2010). Retrieved from www.econstor.eu/handle/10419/36942.

16 Peiró-Palomino & Tortosa-Ausina, "Can Trust Effects on Development Be Generalized? A Response by Quantile." Working Papers, Economics Department, Universitat Jaume I, Castellón, Spain, 2012.

17 Traxler, "Social Norms and Conditional Cooperative Taxpayers." *European Journal of Political Economy* 26(1) (2010): 89–103.

18 Cummings et al., "Tax Morale Affects Tax Compliance."

19 Halla, "Tax Morale and Compliance Behavior: First Evidence on a Causal Link."

20 Pryor, "The Impact of Income Inequality on Values and Attitudes." *The Journal of Socio-Economics* 41(5) (2012): 615–622.

21 Norton & Ariely, "Building a Better America – One Wealth Quintile at a Time." *Perspectives on Psychological Science* 6(1) (2011): 9–12.

22 McCall & Kenworthy, "Americans' Social Policy Preferences in the Era of Rising Inequality." *Perspectives on Politics* 7(3) (2009): 459–484.

23 Neckerman & Torche, "Inequality: Causes and Consequences." *Annual Review of Sociology* 33(1) (2007): 335–357.

24 Staerklé et al., "A Normative Approach to Welfare Attitudes." In *Contested Welfare States: Welfare Attitudes in Europe and Beyond*. (Stanford University Press, 2012), 81.

25 Baslevent & Kirmanoglu, "Discerning Self-Interested Behaviour in Attitudes Towards Welfare State Responsibilities Across Europe." *International Journal of Social Welfare* 20(4) (2011): 344-352.

26 Jakobsen, "Welfare Attitudes and Social Expenditure: Do Regimes Shape Public Opinion?" *Social Indicators Research* 101(3) (2011): 323–340.

The analysis presented here builds on this prior work by testing the hypothesis that individuals who vary in these attitudes respond differently, in regard to their beliefs about paying taxes, when the form of government under which they live changes. An understanding of the relationships between social norms, individual attitudes, and tax morale may be crucial to formulating effective policy responses to public finance difficulties currently experienced by many national and sub-national jurisdictions.

Data

The basis for analysis is individual-level survey data from the WVS for East and West Germany in 1990, as well as for the same eastern and western communities of reunified Germany in 1997. For brevity, the terms East Germany and West Germany are used for both pre- and post-unification. The 1990 and 1997 WVS surveys provide repeated cross-sectional data for nationally representative samples—ranging in size from 1,000 to 2,000 individuals per nation—conducted through stratified random sampling of the general population 18 years or older across countries on all six inhabited continents. Basic descriptive statistics for all variables used in the present analysis are presented in Table 1.

The dependent variable for all analyses is tax morale, obtained from the survey respondent's answer to the following request, which is one in a series of such:

"Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between: . . . Cheating on taxes if you have a chance."

Responses are coded as an integer ranging from one (never justifiable) to ten (always justifiable). Following the example of Feld & Torgler[27] and others, this variable was recoded into a four-point scale. Responses coded from five to ten were collapsed into response four due to a lack of variance, so that after recoding response four represents "cheating is often or always justifiable." The distributions of recoded tax morale for East and West Germany in 1990 and 1997 appear in Figure 1 in Appendix 1. The notable feature of these is the shift in the East German distribution following reunification, from a strongly unimodal form in 1990—nearly 70 percent stating "cheating is never justifiable"—to a more bimodal form in 1997, when a larger proportion chose "often or always justifiable," similar to both years of the more stable West German distribution.

27 Feld & Torgler, "Tax Morale after the Reunification of Germany."

Table 1: Descriptive statistics for all variables[a]

	Mean	*S.D.*	*Min*	*Max*
Tax Morale[b]	2.11	1.26	1	4
Income inequality preference[c]	6.15	2.81	1	10
Government responsibility preference[d]	4.93	2.94	1	10
Age	44.96	16.82	18	90
Female	0.53	.50	0	1
Marital Status	*Proportions*	-	1	6
1 = married	58.2%	-	-	-
2 = living together as married	7.5%	-	-	-
3 = divorced	5.6%	-	-	-
4 = separated	0.9%	-	-	-
5 = widowed	9.7%	-	-	-
6 = single/never married	18.0%	-	-	-
Employment Status	*Proportions*	-	1	8
1 = full time	49.9%	-	-	-
2 = part time	7.8%	-	-	-
3 = self-employed	2.4%	-	-	-
4 = retired	21.5%	-	-	-
5 = housewife	8.4%	-	-	-
6 = students	4.2%	-	-	-
7 = unemployed	5.3%	-	-	-
8 = other	0.6%	-	-	-
Log of income decile	1.34	0.67	0	2.30
Generalized trust in others	0.33	0.47	0	1
Confidence in justice system	2.51	0.78	1	4
Religiosity (frequency of attendance)	3.20	2.32	1	8

N = 4,123 (West Germany = 54%; 1990 = 63%)
[a] Obtained from World Values Survey, Waves 2 & 3 (WVS Association, 2006).
[b] Level 1 = "Cheating on taxes is never justifiable" (high tax morale).
[c] Level 1 = "Incomes should be made more equal."
[d] Level 1 = "People should take more responsibility to provide for themselves."

The WVS data sets include measures of respondent attitudes on income inequality ("Incomes should be made more equal." versus "We need larger income differences as incentives.") and government responsibility for individual welfare ("People should take more responsibility to provide for themselves." versus "The government should take more responsibility to ensure that everyone is provided for."). For many nations, these variables display a rather pronounced bimodal

distribution.[28, 29, 30] Distributions of these two preference variables, by country and year, are presented in Figures 2 and 3 in Appendix 1, which show no such divide of German views on these questions. The notable feature is the pronounced shift in the East German preference distribution following reunification, from individual-oriented (with a preference for less income equality and less government responsibility for welfare) to social-oriented. These preference variables are included as independent variables in an exploratory investigation of whether these large shifts in attitude distributions have a strong relationship with tax morale when other determinants are held constant.

Data for commonly used individual-level controls are obtained from the WVS data sets, including:

- Age
- Gender
- Marital status, a factor with six levels
- Employment status, a factor with eight levels
- Income, which is coded as decile, used here in logarithmic form, following standard practice
- Trust in others, coded as a binary variable: "Most people can be trusted." versus "You need to be very careful in dealing with people."
- Confidence in national justice system, a factor with four levels
- Religiosity, a factor with eight levels, measured as frequency of attending religious services.

Education data was not collected in any form for East or West Germany in the 1990 WVS, and so no control for education level appears in the present analysis, a noteworthy limitation.

Much cross-national investigation of tax morale has supplemented large-N survey data such as the WVS with a few broad country-level economic indicators.[31,32, 33, 34] Following this example, gross domestic product (GDP) per capita and measures of unemployment and income inequality were initially incorporated. With the use of only two national units for the present analysis, country-level variables are strongly collinear with dummy variables for country and year (which are included to control for unobserved country effects and secular trends) and thus are necessarily excluded from the analysis.

28 Kerr, "Income Inequality and Social Preferences for Redistribution and Compensation Differentials." (Working Paper No. w17701). *National Bureau of Economic Research*. (2011).
29 Davis & Knauss, "The Moral Consequences of Economic Growth: An Empirical Investigation." (2011). Available at SSRN 1892177.
30 Jakobsen, "Welfare Attitudes and Social Expenditure: Do Regimes Shape Public Opinion?"
31 Alm & Torgler, "Culture Differences and Tax Morale in the United States and in Europe."
32 Feld & Torgler, "Tax Morale after the Reunification of Germany."
33 Lago-Peñas & Lago-Peñas, "The determinants of tax morale in comparative perspective," 442–444.
34 Palil & Mustapha, "The Evolution and Concept of Tax Compliance in Asia and Europe." *Australian Journal of Basic and Applied Sciences* 5(11) (2011): 557–563.

Theoretical Model

The analysis is developed around the following theoretical model of tax morale:

$$\text{tax morale}_{i,t} = \beta_0 + \beta_1 \times \text{income inequality preference}_{i,t} + \beta_2 \times \text{government responsibility preference}_{i,t} + \delta \times \text{change in governmentc,t} + \Pi \times X_{i,t}$$, where:

- tax morale$_{i,t}$ is the ordered response of individual *i* at time *t* to the question "How often is cheating on taxes justifiable?";
- income inequality preference$_{i,t}$ is the preference of individual *i* at time *t* for some degree of income equality;
- government responsibility preference$_{i,t}$ is the preference of individual *i* at time *t* for some degree of government responsibility for individual welfare;
- change in government$_{c,t}$ is a country-level "treatment" dummy variable that is equal to zero for West Germany for both years and for East Germany in 1990, and one for East Germany in 1997;
- $X_{i,t}$ is a vector of individual-level socio-economic control variables; and
- $\beta_0 \ldots \beta_3$, Π, and treatment effect δ, represent coefficients to be estimated.

Empirical Method

OLS and ordered probit regression are used to estimate the parameters and average partial effects (APE) of the theoretical model of tax morale using three independent variable specifications.

- Model (a) includes all variables discussed above, plus fixed-effect dummy variables for country and year, with no interaction terms.
- Model (b) includes all terms in (a), plus the interaction term *Government responsibility preference* × *Confidence in justice system*, intended to reveal whether the impact of government responsibility preference on tax morale is stronger for individuals with certain levels of confidence in the justice system.
- Model (c) includes all terms in (a), plus the interaction term *Government responsibility preference* × *Change in government*, intended to reveal whether the impact of government responsibility preference on tax morale is stronger after a change in government.

Statistical analysis was performed using Stata 12.1,[35] and output from regression analyses and partial effects computations were formatted with the aid of user-written routine outreg2.[36] The small number of countries in the analysis makes the use of cluster-robust standard errors inadvisable; heteroskedasticity-robust standard errors are used in all models.

35 StataCorp. 2011. Stata: Release 12. Statistical software. College Station, TX: StataCorp LP.
36 Wada, Outreg2. Undated software. roywada@hotmail.com.

Results and Discussion

Regression parameters estimated for ordered categorical response models are not directly interpretable. Because of this, average partial effects are estimated to determine the impact of each predictor variable on the outcome variable. Ordered probit average partial effect estimates for each of the three models at the two extreme dependent variable outcomes—outcome one, tax cheating is never justifiable; and outcome four, tax cheating is often or always justifiable—are presented in Table 2. The estimated average partial effects for the two central outcomes (outcomes two and three, not shown) are all of the same sign as the APEs for outcome four but are significantly smaller in magnitude, approximately 5 to 10 percent of the outcome four APE. The APEs for each independent variable represent the estimated effect on the probability of each outcome, and so must sum to zero. Thus, the small central outcome APEs imply nearly symmetric APEs for the extreme outcomes. For each independent variable, the outcome four APE has the opposite sign of the outcome one APE and approximately 80 percent of its magnitude. In light of this symmetry, discussion of results below will generally focus on effects only on outcome one, high tax morale. Ordered probit coefficient estimates appear in the Appendix in Table A-1. OLS estimated coefficients and average partial effects, which confirm the signs and relative magnitudes of the ordered probit APEs, are presented in Table A-2 in the Appendix.

The country-level fixed-effect for East Germany has a large and statistically significant ($p<0.001$) positive impact on tax morale. Compared to West Germans, East Germans are estimated to be approximately 30 percentage points more likely to feel that tax cheating is never justifiable during the 1990s, with other variables held constant. The country effect is the strongest of all predictors considered here, a finding commonly observed in the literature.[37]

All models predict that the change in government to which East Germans were exposed has a strong and statistically significant negative impact on tax morale. The analysis suggests that this change resulted, on average, in an 18 to 20 percentage point decrease in the probability of a respondent stating that tax cheating is never justifiable, with other variables held constant.

37 Lago-Peñas & Lago-Peñas, "The determinants of tax morale in comparative perspective," 443.

Table 2: Determinants of Tax Morale in West and East Germany (1990, 1997) – Ordered Probit Average Partial Effect Estimates

	Model (a)		Model (b)		Model (c)	
	Tax cheating never justifiable	Often or always justifiable	Tax cheating never justifiable	Often or always justifiable	Tax cheating never justifiable	Often or always justifiable
Interactions included	*None*		*Gov. responsibility pref × Confidence in justice system*		*Gov. responsibility pref × Change in government*	
Income equality pref.	-0.006 (0.003)*	0.005 (0.002)*	-0.006 (0.003)*	0.005 (0.002)*	-0.006 (0.003)*	0.005 (0.002)*
Government responsibility pref.	0.005 (0.003)*	-0.004 (0.002)*	0.005 (0.003)	-0.004 (0.002)*	0.006 (0.003)*	-0.004 (0.002)*
Age	0.004 (0.001)***	-0.003 (0.001)***	0.004 (0.001)***	-0.003 (0.001)***	0.004 (0.001)***	-0.003 (0.001)***
Female	0.072 (0.015)***	-0.057 (0.012)***	0.071 (0.015)***	-0.056 (0.012)***	0.070 (0.015)***	-0.056 (0.012)***
Marital Status						
Live together	-0.052 (0.027)	0.042 (0.023)	-0.053 (0.028)	0.042 (0.023)	-0.052 (0.027)	0.042 (0.023)
Divorced	-0.008 (0.031)	0.006 (0.024)	-0.008 (0.031)	0.006 (0.024)	-0.003 (0.031)	0.002 (0.024)
Separated	-0.083 (0.073)	0.069 (0.064)	-0.076 (0.073)	0.062 (0.064)	-0.073 (0.073)	0.059 (0.063)
Widowed	-0.041 (0.029)	0.033 (0.023)	-0.041 (0.029)	0.033 (0.023)	-0.039 (0.029)	0.031 (0.023)
Never married	-0.062 (0.021)**	0.050 (0.018)**	-0.062 (0.021)**	0.050 (0.018)**	-0.061 (0.021)**	0.050 (0.018)**
Employment status						
Part-time	-0.031 (0.027)	0.026 (0.022)	-0.030 (0.027)	0.024 (0.022)	-0.029 (0.027)	0.024 (0.022)
Self-employed	-0.046 (0.044)	0.038 (0.038)	-0.045 (0.044)	0.037 (0.038)	-0.045 (0.044)	0.037 (0.038)
Retired	0.042 (0.027)	-0.032 (0.020)	0.042 (0.027)	-0.032 (0.020)	0.042 (0.027)	-0.032 (0.020)
Housewife	0.001 (0.028)	-0.001 (0.022)	0.002 (0.028)	-0.002 (0.022)	0.003 (0.028)	-0.002 (0.022)
Student	-0.065 (0.035)	0.054 (0.031)	-0.065 (0.035)	0.054 (0.030)	-0.063 (0.035)	0.053 (0.031)
Unemployed	-0.018 (0.033)	0.015 (0.027)	-0.020 (0.033)	0.016 (0.027)	-0.025 (0.033)	0.020 (0.027)

	Model (a)		Model (b)		Model (c)	
	Tax cheating never justifiable	Often or always justifiable	Tax cheating never justifiable	Often or always justifiable	Tax cheating never justifiable	Often or always justifiable
Interactions included	*None*		*Gov. responsibility pref × Confidence in justice system*		*Gov. responsibility pref × Change in government*	
Other	0.121 (0.084)	-0.086 (0.054)	0.118 (0.084)	-0.085 (0.054)	0.116 (0.084)	-0.083 (0.054)
Log of income decile	-0.012 (0.012)	0.009 (0.009)	-0.013 (0.012)	0.010 (0.009)	-0.014 (0.012)	0.011 (0.009)
Trusting	-0.028 (0.014)*	0.023 (0.011)*	-0.029 (0.014)*	0.023 (0.011)*	-0.027 (0.014)	0.021 (0.011)
Confidence in justice system						
Low	0.053 (0.026)*	-0.046 (0.023)*	0.060 (0.026)*	-0.054 (0.024)*	0.053 (0.026)*	-0.046 (0.023)*
Moderate	0.083 (0.027)**	-0.069 (0.023)**	0.090 (0.026)***	-0.078 (0.024)**	0.084 (0.027)**	-0.071 (0.023)**
High	0.195 (0.033)***	-0.149 (0.026)***	0.196 (0.033)***	-0.154 (0.027)***	0.195 (0.033)***	-0.149 (0.026)***
Religious service attendance						
2. Less than once per year	0.021 (0.021)	-0.017 (0.017)	0.022 (0.021)	-0.018 (0.017)	0.022 (0.021)	-0.018 (0.017)
3. Once per year	0.007 (0.023)	-0.005 (0.019)	0.006 (0.023)	-0.005 (0.019)	0.008 (0.023)	-0.007 (0.019)
4. Most holidays	0.047 (0.056)	-0.038 (0.044)	0.044 (0.056)	-0.036 (0.044)	0.048 (0.056)	-0.038 (0.044)
5. Only major holidays	0.039 (0.022)	-0.032 (0.018)	0.039 (0.022)	-0.032 (0.018)	0.040 (0.022)	-0.032 (0.018)
6. Once per month	0.090 (0.024)***	-0.070 (0.018)***	0.091 (0.024)***	-0.071 (0.018)***	0.092 (0.024)***	-0.071 (0.018)***
7. Once per week	0.100 (0.025)***	-0.077 (0.019)***	0.102 (0.025)***	-0.079 (0.019)***	0.101 (0.025)***	-0.078 (0.019)***
8. More than once per week	0.216 (0.040)***	-0.151 (0.024)***	0.217 (0.040)***	-0.151 (0.024)***	0.218 (0.040)***	-0.152 (0.024)***
Year 1997	0.029 (0.020)	-0.023 (0.015)	0.030 (0.020)	-0.024 (0.015)	0.033 (0.020)	-0.026 (0.015)
East Germany	0.292 (0.017)***	-0.227 (0.014)***	0.295 (0.017)***	-0.229 (0.014)***	0.292 (0.017)***	-0.226 (0.014)***
Change in government	-0.182 (0.026)***	0.160 (0.025)***	-0.187 (0.026)***	0.166 (0.025)***	-0.207 (0.026)***	0.192 (0.028)***
Observations	4,123	4,123	4,123	4,123	4,123	4,123

Notes: Robust standard errors in parentheses (*** p<0.001, ** p<0.01, * p<0.05).
Reference groups: married, full-time employment, confidence in justice system = none, religious service attendance = none or nearly none, year 1990, West Germany.

Taken together, these first two empirical findings indicate that the large decline in East German tax morale depicted in Figure 1 in the Appendix is statistically significant and not an artifact that disappears with the application of statistical controls such as those used in this analysis. The observed association of lowered tax morale with increased democracy, a perhaps counterintuitive result, has generally been explained with reference to the internalization of norms by citizens of a totalitarian state.[38] The finding that tax morale increases with age (discussed below) supports this theoretical linkage. Further support comes from additional regression analysis performed for the two nations considered independently, not presented here, which reveals that age is a more important factor, substantively and significantly, for East Germany than for West Germany.[39]

Other strong and statistically significant effects, with other variables held constant, on the probability of a respondent stating that tax cheating is never justifiable include:

- Higher levels of religiosity, a 9 to 22 percentage point increase; and
- Moderate or high levels of confidence in the justice system, an 8 to 20 percentage point increase.

Variables found to be statistically significant but having only modest substantive impact on the probability of a respondent stating that tax cheating is never justifiable include:

- Age (a 10-year increase is associated with a 4 percentage point increase);
- Gender (women are predicted to have a 7 percentage point higher probability); and
- Never married (associated with a 6 percentage point decrease, compared to being married).

The estimated impacts of religiosity, confidence in the justice system, age, gender, and marital status are in keeping with theory and previous empirical findings.[40]

The preference measures for income inequality and government responsibility for individual welfare are found to be only modestly statistically significant ($p<0.05$) and substantively negligible. A three-point change in either view (slightly higher than one standard deviation, on a ten-point scale—see Table 1) is associated with a 1.5 to 2 percentage point change in the probability of either of the extreme tax morale outcomes. Lower income inequality preference and higher government responsibility preference are associated with an increased probability of stating that tax cheating is never justifiable. The addition of an interaction term

38 See, e.g., Posner, "Law and Social Norms: The Case of Tax Compliance," 1786–1790, and Mummert and Schneide, "The German Shadow Economy: Parted in a United Germany?" 298.

39 Similar findings were reported by Feld & Torgler, "Tax Morale after the Reunification of Germany," 16.

40 See, e.g., Lago-Peñas & Lago-Peñas, "The determinants of tax morale in comparative perspective," 442–444.

between government responsibility preference and a change in government—the treatment effect—in model (c) increases the strength of the estimated effect of a change in government by 2.5 to 3 percentage points, relative to the treatment impact predicted by model (a), which is equivalent aside from this interaction. Goodness of fit measures (presented in Table A-1) show no significant differences between the three models.

Table 3 presents the estimated partial effect of a change in government for different values of the government responsibility preference variable. The overall APE is included for comparison. The negative effect on tax morale of the change in form of government is appreciably smaller for respondents having a higher preference for government responsibility for the welfare of individuals, even with controls for age and other significant predictors. In the German context, this conforms with the norm-internalization theory. A similar analysis indicates that the partial effect of change in government on tax morale is not substantially different for individuals with extreme levels of income inequality preference.

Table 3: "Treatment Effect" on Outcome 1 (Tax cheating never justifiable) at Different Levels of Government Responsibility Preference – Model (c), Ordered Probit Estimates

	APE	*PE at four levels of government responsibility preference:*			
		Low (1)	*1 SD below mean (2)*	*1 SD above mean (8)*	*High (10)*
Change in government	-0.207 (0.026)***	-0.271 (0.038)***	-0.256 (0.034)***	-0.157 (0.028)***	-0.121 (0.036)***
Observations	4,123	4,123	4,123	4,123	4,123
Robust standard errors in parentheses (*** p<0.001, ** p<0.01, * p<0.05).					

One limitation of the empirical results is that the percentage of outcomes correctly predicted by the ordered probit estimates for the first outcome, tax cheating is never justifiable, is markedly lower than for the other three outcomes, and is lower than the percentage correctly predicted by the OLS estimates (see Tables A-1 and A-2). This result may be due to a failure of the parallel regression assumption—using constant slopes, with different intercepts, to model the set of available choices—that is implicit in the use of conventional ordered probit regression to estimate an ordered discrete choice model. Although all published empirical work on the determinants of tax morale use either the ordered probit estimator as employed here or the very similar ordered logit, more recently developed regression procedures such as gologit2 implement a generalized ordered probit estimator, which relaxes the parallel regression assumption and may produce more uniformly correct predictions.

Conclusion

The efficient collection of tax revenue, a core function of effective public administration, depends heavily on tax morale, the propensity of individuals to pay taxes. An understanding of the factors that determine tax morale is thus crucial to public finance.

OLS and ordered probit regression are used in a regression-based, difference-in-difference research design with individual-level data from the WVS of East and West Germany for two survey periods spanning the German reunification. This analysis allows estimation of the parameters and partial effects of three models relating individual tax morale to the effect of a change in government, as well as to measures of two individual attitudes that are plausibly relevant to tax morale, and a battery of statistical controls. The estimated impact of the change in government on tax morale is statistically and substantively significant, ceteris paribus, suggesting that exposing former East German citizens to democratic capitalism during the 1990s reduced their tax morale. The relationships between tax morale and attitudes regarding income inequality and government responsibility are statistically modest and substantively negligible, but the effect of the change in government on tax morale is found to differ substantively and statistically for individuals preferring different levels of government responsibility for the welfare of citizens. Theoretical mechanisms based on the exposure of former East German citizens to new social norms following reunification appear to explain these empirical findings.

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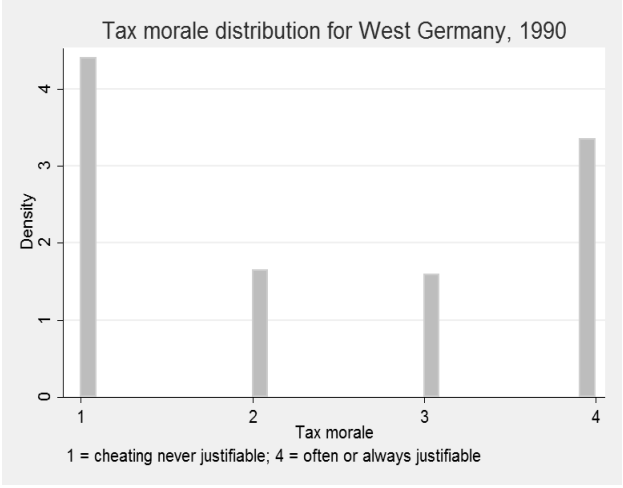
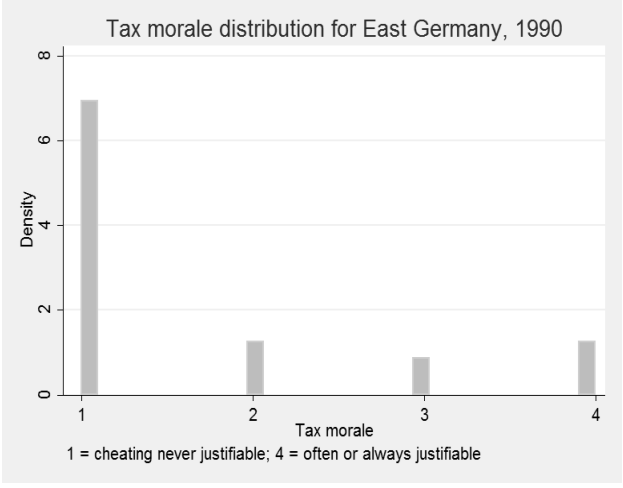
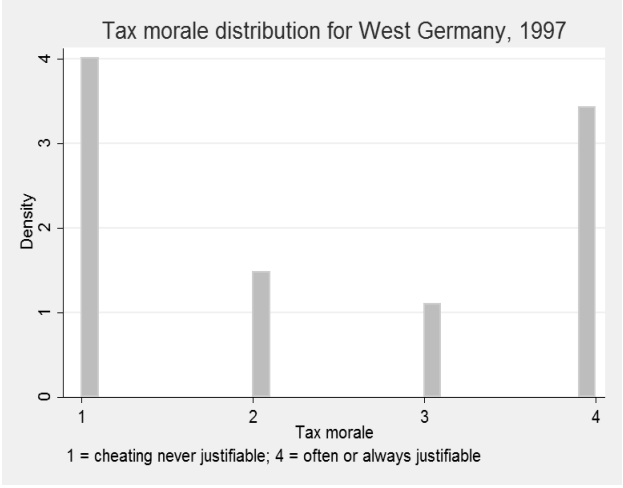
Appendix

Figure 1: Tax Morale Distribution by Country and Year






Tax morale distribution for West Germany, 1997
Density
0
1
2
3
4
1
2
3
4
Tax morale
1 = cheating never justifiable; 4 = often or always justifiable

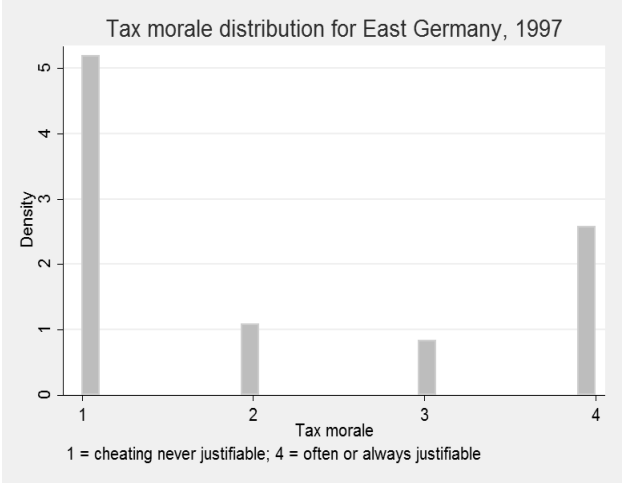
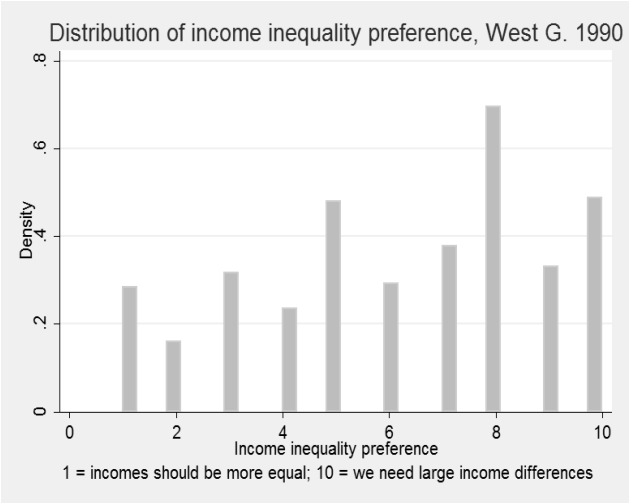
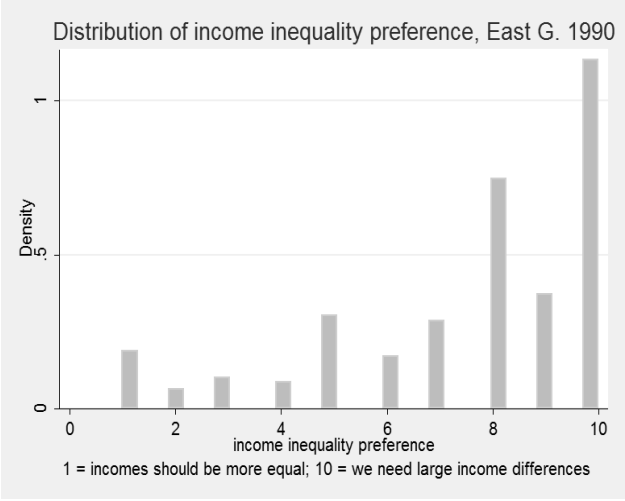
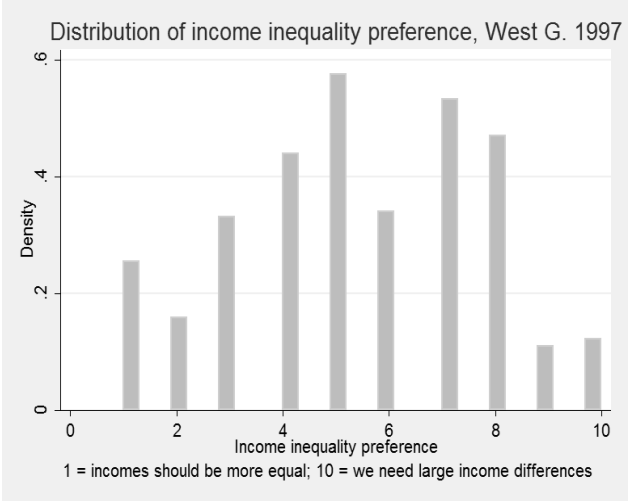

Tax morale distribution for East Germany, 1997
Density
0
1
2
3
4
5
1
2
3
4
Tax morale
1 = cheating never justifiable; 4 = often or always justifiable

Figure 2: Income Inequality Preference Distribution by Country and Year






Distribution of income inequality preference, West G. 1997
Density
0
.2
.4
.6
0
2
4
6
8
10
Income inequality preference
1 = incomes should be more equal; 10 = we need large income differences

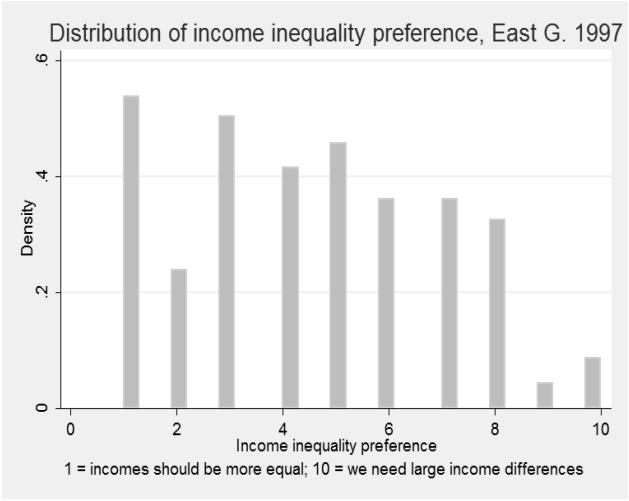
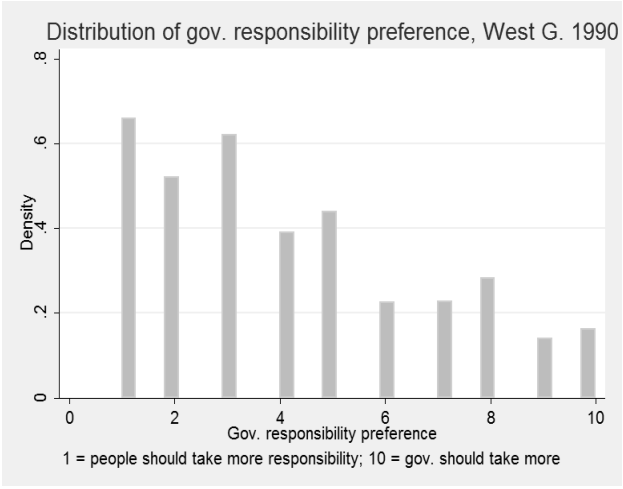
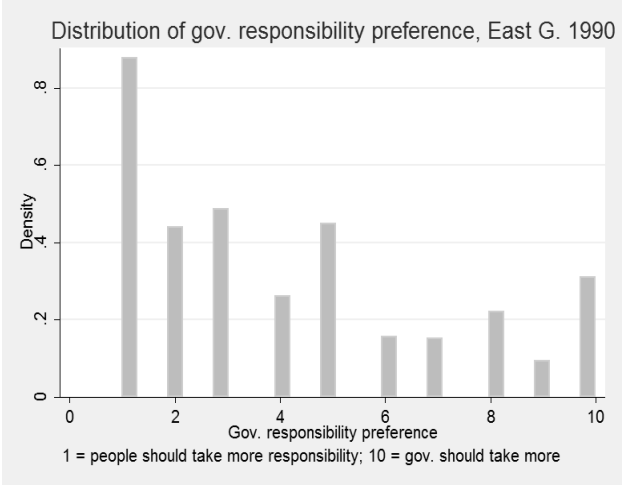
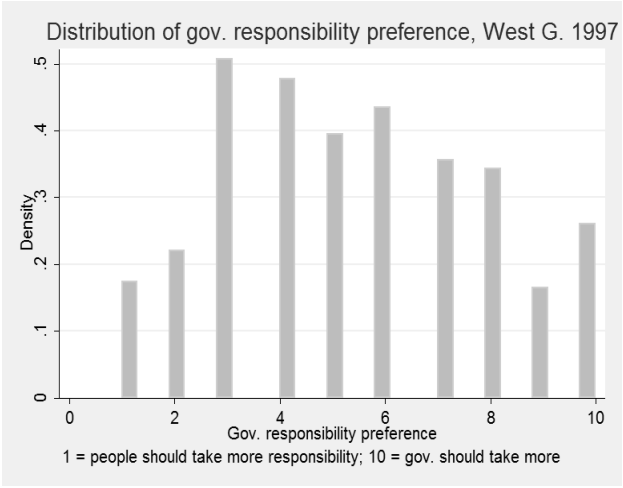

Distribution of income inequality preference, East G. 1997
Density
0
.2
.4
.6
0
2
4
6
8
10
Income inequality preference
1 = incomes should be more equal; 10 = we need large income differences

Figure 3: Government Responsibility Preference Distribution by Country and Year






Distribution of gov. responsibility preference, West G. 1997
Density
0
.1
.2
.3
.4
.5
0
2
4
6
8
10
Gov. responsibility preference
1 = people should take more responsibility; 10 = gov. should take more

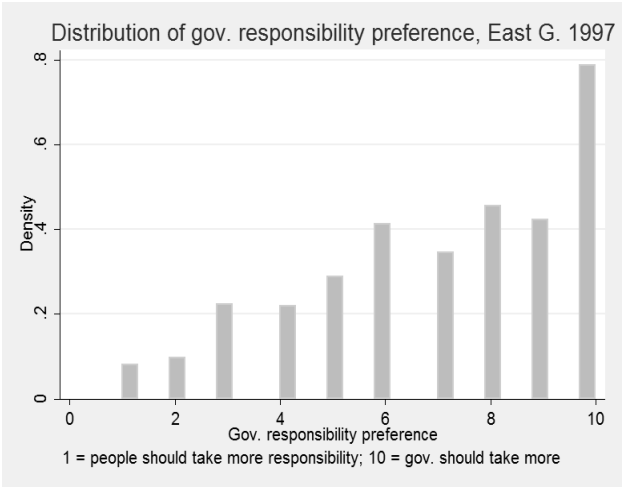

Distribution of gov. responsibility preference, East G. 1997
Density
0
.2
.4
.6
.8
0
2
4
6
8
10
Gov. responsibility preference
1 = people should take more responsibility; 10 = gov. should take more

Table A-1: Determinants of Tax Morale in West and East Germany (1990, 1997) – Ordered Probit Coefficient Estimates

	Model (a)	*Model (b)*	*Model (c)*
Income inequality preference	0.018 (0.007)*	0.018 (0.008)*	0.016 (0.008)*
Government responsibility preference	-0.015 (0.007)*	-0.050 (0.021)*	-0.005 (0.008)
Age	-0.011 (0.002)***	-0.011 (0.002)***	-0.010 (0.002)***
Female	-0.201 (0.043)***	-0.198 (0.043)***	-0.195 (0.043)***
Marital Status			
Live together	0.144 (0.076)	0.146 (0.076)	0.144 (0.076)
Divorced	0.022 (0.087)	0.022 (0.087)	0.007 (0.087)
Separated	0.232 (0.204)	0.212 (0.204)	0.203 (0.204)
Widowed	0.114 (0.080)	0.115 (0.080)	0.108 (0.080)
Never married	0.172 (0.059)**	0.171 (0.059)**	0.171 (0.059)**
Employment Status			
Part-time	0.087 (0.074)	0.082 (0.074)	0.080 (0.074)
Self-employed	0.128 (0.122)	0.126 (0.122)	0.124 (0.123)
Retired	-0.116 (0.075)	-0.116 (0.075)	-0.115 (0.075)
Housewife	-0.002 (0.077)	-0.006 (0.077)	-0.007 (0.077)
Student	0.180 (0.097)	0.179 (0.097)	0.174 (0.097)
Unemployed	0.051 (0.091)	0.054 (0.091)	0.070 (0.092)
Other	-0.339 (0.242)	-0.332 (0.241)	-0.324 (0.240)
Log of income decile	0.033 (0.032)	0.035 (0.032)	0.038 (0.032)
Trusting	0.079 (0.039)*	0.080 (0.039)*	0.075 (0.039)

	Model (a)	*Model (b)*	*Model (c)*
Confidence in justice system			
Low	-0.149 (0.074)*	-0.337 (0.143)*	-0.150 (0.074)*
Moderate	-0.232 (0.075)**	-0.458 (0.143)**	-0.237 (0.075)**
High	-0.551 (0.096)***	-0.868 (0.176)***	-0.550 (0.096)***
Religious service attendance			
2. Less than once per year	-0.059 (0.057)	-0.060 (0.058)	-0.061 (0.057)
3. Once per year	-0.018 (0.065)	-0.017 (0.065)	-0.022 (0.064)
4. Most holidays	-0.131 (0.156)	-0.123 (0.156)	-0.132 (0.156)
5. Only major holidays	-0.108 (0.062)	-0.110 (0.062)	-0.111 (0.062)
6. Once per month	-0.250 (0.066)***	-0.253 (0.066)***	-0.255 (0.066)***
7. Once per week	-0.279 (0.071)***	-0.284 (0.071)***	-0.282 (0.071)***
8. More than once per week	-0.618 (0.123)***	-0.619 (0.123)***	-0.623 (0.123)***
Year 1997	-0.080 (0.055)	-0.085 (0.055)	-0.093 (0.055)
East Germany	-0.816 (0.053)***	-0.826 (0.054)***	-0.815 (0.053)***
Change in government	0.531 (0.081)***	0.548 (0.082)***	0.875 (0.147)***
Confidence in justice system *× Gov. responsibility preference*			
Low confidence in justice system × Gov. responsibility preference	-	0.034 (0.023)	-
Med. confidence in justice system × Gov. responsibility preference	-	0.041 (0.023)	-
High confidence in justice system × Gov. responsibility preference	-	0.063 (0.031)*	-
Change in government × Gov. responsibility preference	-	-	-0.053 (0.019)**

	Model (a)	*Model (b)*	*Model (c)*
Constant – cutpoint 1	-1.027 (0.145)***	-1.225 (0.180)***	-0.989 (0.145)***
Constant – cutpoint 2	-0.632 (0.144)***	-0.829 (0.179)***	-0.593 (0.144)***
Constant – cutpoint 3	-0.266 (0.144)	-0.463 (0.179)**	-0.226 (0.144)
Observations	4,123	4,123	4,123
Pseudo R-squared	0.0649	0.0654	0.0658
Log likelihood	-4,680	-4,677	-4,676
AIC	9,427.6	9,428.5	9,421.1
Percent correctly predicted (overall)	63.6	63.6	63.7
Percent correctly pred. (outcome 1)	17.2	17.2	17.6
Notes: Robust standard errors in parentheses (*** p<0.001, ** p<0.01, * p<0.05). Reference groups: married, full-time employment, confidence in justice system = none, religious service attendance = none or nearly none, year 1990, West Germany.			

Table A-2: Determinants of Tax Morale in West and East Germany (1990, 1997) – OLS Coefficient and Average Partial Effect Estimates

	Model (a)		*Model (b)*		*Model (c)*	
	Coefficient	*APE*	*Coefficient*	*APE*	*Coefficient*	*APE*
Income inequality preference	0.017 (0.007)*	0.017 (0.007)*	0.016 (0.007)*	0.016 (0.007)*	0.015 (0.007)*	0.015 (0.007)*
Government responsibility preference	-0.012 (0.007)	-0.012 (0.007)	-0.048 (0.020)*	-0.011 (0.007)	-0.004 (0.007)	-0.013 (0.007)
Age	-0.010 (0.002)***	-0.010 (0.002)***	-0.010 (0.002)***	-0.010 (0.002)***	-0.010 (0.002)***	-0.010 (0.002)***
Female	-0.198 (0.042)***	-0.198 (0.042)***	-0.195 (0.042)***	-0.195 (0.042)***	-0.193 (0.042)***	-0.193 (0.042)***
Marital status						
Live together	0.172 (0.080)*	0.172 (0.080)*	0.172 (0.080)*	0.172 (0.080)*	0.171 (0.080)*	0.171 (0.080)*
Divorced	0.038 (0.086)	0.038 (0.086)	0.038 (0.086)	0.038 (0.086)	0.027 (0.086)	0.027 (0.086)
Separated	0.276 (0.217)	0.276 (0.217)	0.258 (0.217)	0.258 (0.217)	0.248 (0.217)	0.248 (0.217)
Widowed	0.124 (0.069)	0.124 (0.069)	0.124 (0.069)	0.124 (0.069)	0.119 (0.069)	0.119 (0.069)
Never married	0.195 (0.062)**	0.195 (0.062)**	0.195 (0.062)**	0.195 (0.062)**	0.195 (0.061)**	0.195 (0.061)**
Employment status						
Part-time	0.096 (0.077)	0.096 (0.077)	0.092 (0.077)	0.092 (0.077)	0.091 (0.077)	0.091 (0.077)
Self-employed	0.154 (0.131)	0.154 (0.131)	0.151 (0.131)	0.151 (0.131)	0.148 (0.131)	0.148 (0.131)
Retired	-0.095 (0.071)	-0.095 (0.071)	-0.095 (0.071)	-0.095 (0.071)	-0.095 (0.071)	-0.095 (0.071)
Housewife	-0.015 (0.079)	-0.015 (0.079)	-0.019 (0.079)	-0.019 (0.079)	-0.019 (0.079)	-0.019 (0.079)
Student	0.239 (0.106)*	0.239 (0.106)*	0.239 (0.106)*	0.239 (0.106)*	0.234 (0.107)*	0.234 (0.107)*
Unemployed	0.049 (0.093)	0.049 (0.093)	0.053 (0.093)	0.053 (0.093)	0.066 (0.093)	0.066 (0.093)
Other	-0.293 (0.231)	-0.293 (0.231)	-0.284 (0.230)	-0.284 (0.230)	-0.278 (0.229)	-0.278 (0.229)
Log of income decile	0.015 (0.032)	0.015 (0.032)	0.016 (0.032)	0.016 (0.032)	0.020 (0.032)	0.020 (0.032)

	Model (a)		*Model (b)*		*Model (c)*	
	Coefficient	*APE*	*Coefficient*	*APE*	*Coefficient*	*APE*
Trusting	0.070 (0.040)	0.070 (0.040)	0.070 (0.040)	0.070 (0.040)	0.066 (0.040)	0.066 (0.040)
Confidence in justice system						
Low	-0.157 (0.073)*	-0.157 (0.073)*	-0.351 (0.142)*	-0.182 (0.074)*	-0.158 (0.073)*	-0.158 (0.073)*
Moderate	-0.234 (0.074)**	-0.234 (0.074)**	-0.457 (0.141)**	-0.258 (0.075)***	-0.238 (0.074)**	-0.238 (0.074)**
High	-0.519 (0.089)***	-0.519 (0.089)***	-0.816 (0.160)***	-0.529 (0.090)***	-0.518 (0.089)***	-0.518 (0.089)***
Religious service attendance						
2. Less than once per year	-0.053 (0.058)	-0.053 (0.058)	-0.055 (0.058)	-0.055 (0.058)	-0.054 (0.058)	-0.054 (0.058)
3. Once per year	-0.019 (0.067)	-0.019 (0.067)	-0.018 (0.067)	-0.018 (0.067)	-0.023 (0.067)	-0.023 (0.067)
4. Most holidays	-0.135 (0.157)	-0.135 (0.157)	-0.125 (0.156)	-0.125 (0.156)	-0.134 (0.157)	-0.134 (0.157)
5. Only major holidays	-0.114 (0.062)	-0.114 (0.062)	-0.116 (0.062)	-0.116 (0.062)	-0.116 (0.062)	-0.116 (0.062)
6. Once per month	-0.249 (0.066)***	-0.249 (0.066)***	-0.252 (0.066)***	-0.252 (0.066)***	-0.253 (0.065)***	-0.253 (0.065)***
7. Once per week	-0.282 (0.067)***	-0.282 (0.067)***	-0.287 (0.067)***	-0.287 (0.067)***	-0.283 (0.067)***	-0.283 (0.067)***
8. More than once per week	-0.553 (0.089)***	-0.553 (0.089)***	-0.554 (0.089)***	-0.554 (0.089)***	-0.557 (0.089)***	-0.557 (0.089)***
Year 1997	-0.088 (0.060)	-0.088 (0.060)	-0.092 (0.060)	-0.092 (0.060)	-0.100 (0.060)	-0.100 (0.060)
East Germany	-0.780 (0.049)***	-0.780 (0.049)***	-0.790 (0.049)***	-0.790 (0.049)***	-0.780 (0.049)***	-0.780 (0.049)***
Change in government	0.486 (0.080)***	0.486 (0.080)***	0.502 (0.081)***	0.502 (0.081)***	0.818 (0.151)***	0.572 (0.087)***
Confidence in justice system × Gov. responsibility preference						
Low confidence in justice system × Gov. responsibility preference	-	-	0.034 (0.022)	-	-	-
Med. confidence in justice system × Gov. responsibility preference	-	-	0.040 (0.023)	-	-	-

	Model (a)		*Model (b)*		*Model (c)*	
	Coefficient	*APE*	*Coefficient*	*APE*	*Coefficient*	*APE*
High confidence in justice system × Gov. responsibility preference	-	-	0.058 (0.027)*	-	-	-
Change in government × Gov. responsibility preference	-	-	-	-	-0.050 (0.019)**	-
Constant	3.118 (0.141)***	-	3.317 (0.176)***	-	3.082 (0.141)***	-
Observations	4,123	4,123	4,123	4,123	4,123	4,123
R-squared	0.140	-	0.141	-	0.142	-
AIC	13,047.9	-	13049.0	-	13,042.1	-
Percent correctly predicted (overall)	55.5	-	55.6	-	55.6	-
Percent correctly pred. (outcome 1)	48.9	-	48.8	-	49.0	

Notes: Robust standard errors in parentheses (*** p<0.001, ** p<0.01, * p<0.05).
Reference groups: married, full-time employment, confidence in justice system = none, religious service attendance = none or nearly none, year 1990, West Germany.