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# Time preferences and political regimes: Evidence from reunified Germany

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## Abstract

This paper presents evidence on the impact of political regimes on time preferences using survey measures of present bias and patience. Treating the German separation and reunification as a natural experiment, our results indicate that the GDR's socialist regime significantly diminished the present bias of its former citizens, while their patience appears to be unaffected.

*Keywords: Time preferences; Political regime; Germany; Natural experiment; SOEP*

*JEL: D02, D12*

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# 1 Introduction

## 1.1 Motivation and main results

Time preferences are crucial to almost all choices with major life impact, such as saving for the future, educational decisions, and both labor-market and health-related behavior (e.g., DellaVigna and Paserman 2005, Golsteyn et al. 2014, Koch et al. 2015, Meier and Sprenger 2010). One parsimonious representation of time preferences that accounts for the empirically important present bias is the  $(\beta, \delta)$  model (e.g., DellaVigna 2009, Laibson 1997, O’Donoghue and Rabin 2015), which has taken a strong foothold in economics. In the  $(\beta, \delta)$  model, present bias implies that subjects attach special importance to immediate payoffs when compared to payoffs in the future, and thereby permits preference reversals (such that what is optimal for the *present self* may not be optimal for *tomorrow’s self*).<sup>1</sup>

This paper explores whether the socialist regime of the German Democratic Republic (GDR) has had a lasting influence on citizens’ time preferences – distinguishing at an individual level between *present bias* and *patience* – in the spirit of the literature arguing that preferences are endogenous to institutions (e.g., Bowles 1998, Fehr and Hoff 2011). To this end, we exploit the reunification of the socialist GDR and the democratic Federal Republic of Germany (FRG) in 1990 after more than four decades of separation as a natural experiment in an analysis of survey measures of present bias and patience from the Socio-Economic Panel (SOEP). Both survey measures are significantly correlated with information on time preferences from incentivized experiments.

Numerous regime differences may have been instrumental in causing time preferences of former GDR citizens to diverge from those of former FRG citizens. The GDR’s massive state-security service, which relied extensively on both a network of unofficial collaborators and extreme forms of repression, strongly incentivized GDR residents to control their impulses. For example, people were on constant alert with regard to the statements they could make and the actions they could undertake without endangering their personal freedom or their physical integrity (Fulbrook 2005: 9). Greater levels of self-control generally lead to a greater congruence between actions an agent would like to undertake and those actually undertaken and thus imply a less pronounced present bias (e.g., Ameriks et al. 2007). Moreover, GDR citizens had to cope with shortages in a myriad of life domains including housing, vacations, and consumption goods. To name just one extreme example, people purchasing cars in the GDR were forced to wait years, even decades, for their vehicles to be delivered (Wolle 2013: 304). Experiencing such

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<sup>1</sup>According to the  $(\beta, \delta)$  model, intertemporal preferences from the perspective of period  $t$  can be represented by  $U^t = u_t + \sum_{\tau=t+1}^T \beta\delta^\tau u_\tau$ , where  $\beta = 1$  corresponds to exponential discounting and  $\beta \in (0, 1)$  reflects present bias (e.g., O’Donoghue and Rabin 2015). Present-biased preferences give special importance to immediate payoffs and allow for time-inconsistent choice (e.g., O’Donoghue and Rabin 1999).

detrimental institutional characteristics over decades may have resulted in long-lasting effects on time preferences – which have shown to be determined by both genetic and environmental influences (e.g., Bezdjian et al. 2011) – such that we expect diminished present bias and greater patience in former GDR citizens.

According to our results, the GDR’s socialist regime indeed significantly diminished the present bias of its former citizens in the long run. In contrast, the regime’s influence on patience is insignificant. When we split the sample into birth cohorts, we find results that are consistent with the idea that a sufficiently long exposure to the socialist regime was necessary for a notable footprint in terms of present bias at the individual level. Against this background, we emphasize that the GDR’s socialist regime continues to shape its former citizens’ lives to this day – in an economically significant way and although the regime ceased to exist in the political sphere – and will continue to do so in the future.

The structure of the paper is as follows. We will explain our research design and discuss related literature in the remainder of Section 1. Section 2 presents the data and Section 3 our empirical analysis including robustness checks. Section 4 concludes.

## 1.2 Research design

We propose that differences in East and West Germans’ time preferences measured after the country’s reunification are related to how the two political regimes *treated* their citizens during the separation, considering the separation of Germany into the FRG and the GDR as a natural experiment. Fuchs-Schündeln and Hassan (2015) argue that Germany’s separation and reunification in fact in many ways constitutes a *perfect* natural experiment.

Several assumptions must be met when seeking to identify long-lasting repercussions of political regimes using the recent German history. First, the treatment was imposed in a way that is random regarding subjects’ key characteristics (including their economic preferences). This issue can be addressed by reference to how the two parts of Germany were formed and to important characteristics of respective populations. The geographical division resulted from the United Kingdom, the United States, and the Soviet Union agreeing on a partition of postwar Germany in 1944, splitting the territory into three sectors of roughly equal population size (e.g., Burchardi and Hassan 2013).<sup>2</sup> Accordingly, the actual imposition of the political regimes was unrelated to key characteristics of the inhabitants (and thus their economic preferences). The comparability of individuals can be argued by referring to – *inter alia* – pre-World War II average per-capita income levels, the amount of destruction experienced during World War II, and their political orientation (Alesina and Fuchs-Schündeln 2007), the proportions of the

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<sup>2</sup>Later on, the US and the UK handed over small parts of their sectors to France.

working population involved in various industries (Beblo and G6rges 2015, Sch6fgen 1998), and the population density (Hubert 1998).

An additional assumption that facilitates causal interpretation is that mobility of individuals between treatment and control groups was very limited. However, around three million people emigrated from the GDR to the FRG between the imposition of the two political regimes and the erection of the Berlin Wall in August 1961 (e.g., Heidemeyer 1994, Hubert 1998). To address this migration issue, we include information pertaining to the survey respondent’s parents to control for the characteristics of the individuals responsible for the migration decision at the time. Time preferences were not part of the SOEP survey before 2008, implying that migration after the reunification must also be controlled. In fact, we have full control with regard to post-reunification migration.<sup>3</sup> Our data set allows us to differentiate between East Germans who lived in the GDR in 1989 and continue to live in that region of Germany today from those who lived in the GDR in 1989 but moved westwards before their participation in the survey years of relevance to us. In addition, the rich SOEP data set enables us to take into account detailed information about individual employment biographies after reunification. This is of importance for our identification strategy because adverse life events (such as long spells of unemployment) were relatively more likely in the transition process in East Germany after reunification – a factor that may have influenced time preferences.

### 1.3 Related literature

Our paper is the first to scrutinize the influence of political regimes on time preferences, taking advantage of the German separation and reunification as an identifying treatment variation. Our paper is thus related to contributions that search for past institutions’ footprints and studies that similarly make use of the German separation and reunification as a natural experiment.

There is some recent literature on the long-term persistence and long-lasting effects of institutions. For example, Acemoglu et al. (2001) relate colonization styles to present economic performance, Nunn and Wantchekon (2009) explain present levels of trust in Africa with references to the slave trade, and Voigtl6nder and Voth (2012) find that pogroms in medieval times predict anti-Semitic violence in Nazi Germany. In comparison to these and related important contributions (see Bisin and Verdier 2011 for a recent overview), our interest involves a much shorter time span and a very different object of study.

There are a number of recent contributions using the German separation and reunification for a better understanding of attitudes and economic behavior. For example, Ockenfels and Weimann (1999) present experimental findings indicating that East Germans exhibit far less

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<sup>3</sup>See, for example, Hunt (2006) and Fuchs-Sch6ndeln and Sch6ndeln (2009) for a description and analysis of migration after the end of the GDR.

solidarity at the private level than West Germans. Brosig-Koch et al. (2011) document that these differences are rather stable over time. Consistent with the idea that East Germans perceive the state to be the responsible actor in that domain, Alesina and Fuchs-Schündeln (2007) show that East Germans support redistribution and state intervention more than West Germans. These authors also highlight that the difference will remain for a considerable period of time. Bauernschuster and Rainer (2012) and Beblo and Gorges (2015) are interested in the long-run impact of regime differences for labor market participation, and Friehe and Mechtel (2014) in potential implications for the relevance of conspicuous consumption. In contrast, the present paper seeks to identify regime repercussions on underlying individual characteristics that simultaneously influence many kinds of behavior, and in that way complements Friehe et al. (2015) which is interested in how the two regimes influenced personality traits of East and West Germans.

Our paper is closely related to Rainer and Siedler (2009) and Heineck and Süßmuth (2013) who examine differences between East and West Germans regarding the level of trust, which can be interpreted as a measure of social preferences (e.g., Becker et al. 2012). Like our study, their contributions rely on the recent German history for identification of causal effects and the German Socio-Economic Panel as one data source.<sup>4</sup> Rainer and Siedler (2009) and Heineck and Süßmuth (2013) find that East Germans show higher levels of social distrust. The latter paper additionally considers risk preferences of former GDR and FRG citizens, and concludes that East Germans are similarly risk averse (after an episode of lower risk aversion).

## 2 Data

Our analysis is based on the German Socio-Economic Panel (SOEP), a nationally representative longitudinal data set created in 1984. Our working sample contains respondents who were either born in Germany or immigrated before 1949 and have provided valid information about where they lived in 1989 (i.e., the year before reunification). These data selection criteria follow from the treatment of the separation and reunification of East and West Germany as a natural experiment.

Specifically, we use the information on patience and impulsivity from the SOEP waves 2008 and 2013. The question regarding patience (i.e., a proxy of the  $\delta$  component of the  $(\beta, \delta)$  model) asks: “Are you generally an impatient person, or someone who always shows great patience?”. Answers are coded on an 11-point scale, with 0 denoting “very impatient” and 10 “very patient”. The patience information was validated by Vischer et al. (2013) by reference to experimentally elicited information on time preferences.

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<sup>4</sup>Rainer and Siedler (2009) primarily build on the German General Social Survey (ALLBUS).

The question concerning impulsivity (i.e., a proxy of the  $\beta$  component of the  $(\beta, \delta)$  model, representing present bias) asks: “Do you generally think things over for a long time before acting - in other words, are you not impulsive at all? Or do you generally act without thinking things over for a long time - in other words, are you very impulsive?”. Answers are again coded on an 11-point scale, with 0 denoting “not at all impulsive” and 10 “very impulsive”.<sup>5</sup> This impulsivity question matches items in the Barratt impulsiveness scale (Patton et al. 1995) and the Tangney et al. (2004) self-control scale, and can be validated using experimentally elicited present bias.<sup>6</sup> More specifically, we find that our survey-based impulsivity measure is – conditional on age and gender – significantly correlated with a present bias measure calculated using the experimental SOEP data also used by Vischer et al. (2013) (see Appendix A for details). In line with our results, Burks et al. (2012) demonstrate a significant correlation between experimental measures of impulsivity and present bias conditional on experimental information on patience and a survey measure of impatience. Hence, we use the SOEP impulsivity measure as a proxy of present bias in our empirical work. Note that Fourage et al. (2014) similarly refer to the patience and impulsivity questions in terms of the  $(\beta, \delta)$  model, for example.

The key covariate in our regression exercises is a dummy variable that is equal to one (zero) when the respondent was a resident of the GDR (FRG) in 1989 (see Table 1 for descriptive statistics). The full vector of covariates includes the respondent’s age, gender, information about the size of the community in which the respondent was raised, parents’ educational background, the respondent’s family and work status, education, income, and information about his or her employment history and health. Table 1 presents summary statistics by treatment status for all the covariates used in our empirical analysis. The results indicate that former GDR and FRG residents differ with respect to covariates such as age, marital status, and labor market experience, suggesting adjustments for covariate differences in our linear regression framework. Imbens and Wooldridge (2009) point out that differences in the observable characteristics of the treatment group and the control group might lead to sensitive estimation results in a linear regression framework. They propose that the imbalance of the covariate distributions should be assessed by testing whether or not the scale-free normalized difference between treatment and control group covariate means exceeds 0.25 (as a rule of thumb). The normalized differences in our data are less than 0.25 for all but three covariates in Column 3 of Table 1, and are in these three cases very close to 0.25. Moreover, two of the three cases do not belong to our preferred empirical model which includes only arguably exogenous variables (the upper part of Table 1).

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<sup>5</sup>The responses with regard to patience and impulsivity are relatively stable over time. In exploring the differences between each subject’s responses in 2008 and 2013 for the 65% of the sample for whom we have observations in both years, we find that the median differences are zero, that 23% (54%) of respondents have a difference of zero (of an absolute level less than or equal to one) with regard to impulsivity, and that 25% (57%) of respondents have a difference of zero (of an absolute level less than or equal to one) with respect to patience.

<sup>6</sup>The terms “present bias” and “self-control issues” are often used synonymously (see, e.g., DellaVigna 2009).

Table 1: Descriptive statistics

	(1)		(2)		(3)
	FRG		GDR		absolute value normalized difference
	count	mean	count	mean	
Age	27,633	52.69	10,106	50.97	0.068
Male	27,633	0.483	10,106	0.484	-0.000
Raised in a large city	27,633	0.232	10,106	0.196	0.061
Raised in a medium city	27,633	0.172	10,106	0.184	-0.022
Raised in a small city	27,633	0.212	10,106	0.245	-0.053
Mother: Low-track secondary school	27,633	0.667	10,106	0.550	0.165
Mother: Intermediate-track secondary school	27,633	0.159	10,106	0.265	-0.177
Mother: High-track secondary school	27,633	0.0548	10,106	0.0662	-0.033
Mother: No vocational degree	27,633	0.377	10,106	0.212	0.255
Mother: Vocational degree	27,633	0.454	10,106	0.560	-0.146
Mother: Technical school degree	27,633	0.00537	10,106	0.0383	-0.150
Mother: University degree	27,633	0.0317	10,106	0.0560	-0.081
Father: Low-track secondary school	27,633	0.635	10,106	0.535	0.141
Father: Intermediate-track secondary school	27,633	0.120	10,106	0.220	-0.183
Father: High-track secondary school	27,633	0.113	10,106	0.102	0.024
Father: No vocational degree	27,633	0.112	10,106	0.0607	0.128
Father: Vocational degree	27,633	0.678	10,106	0.675	0.005
Father: Technical school	27,633	0.0131	10,106	0.0311	-0.083
Father: University degree	27,633	0.0895	10,106	0.103	-0.032
Moved West	27,633	0	10,106	0.166	
Married	27,633	0.561	10,106	0.514	0.064
Divorced	27,633	0.0959	10,106	0.115	-0.042
Widowed	27,633	0.0930	10,106	0.0843	0.021
Years of education	26,838	12.19	9,853	12.24	-0.014
Employed full-time	27,633	0.389	10,106	0.411	-0.031
Employed part-time	27,633	0.115	10,106	0.0977	0.040
Employed vocational	27,633	0.0122	10,106	0.0165	-0.025
Unemployed	27,633	0.0353	10,106	0.0844	-0.140
Pensioner	27,633	0.307	10,106	0.295	0.017
Self-employed	27,633	0.0637	10,106	0.0523	0.033
Blue-collar worker	27,633	0.127	10,106	0.176	-0.095
Civil servant	27,633	0.0454	10,106	0.0212	0.094
Net household income	26,133	2758.9	9,775	2115.5	0.291
Experienced full-time employment (in years)	27,561	18.72	10,082	20.58	-0.090
Experienced part-time employment (in years)	27,561	3.659	10,082	2.298	0.160
Experienced unemployment (in years)	27,561	0.681	10,082	1.823	-0.273
Poor health status	27,603	0.195	10,099	0.202	-0.012

*Notes:* We use SOEP data from 2008 and 2013. SOEP weights are utilized. The dividing line separates our (arguably) exogenous explanatory variables from those explanatory variables that may be influenced by time preferences. For each covariate, the normalized difference is defined as the difference in averages by treatment status, scaled by the square root of the sum of variances.

### 3 Empirical results

In this section, we will first present our main results for patience and present bias. Next, we will consider the duration of the exposure to the regime. Finally, we present results from additional



robustness checks.

### 3.1 Main results

In Table 2, we see that the treatment group’s mean of the proxy for present bias is notably lower than that of the control group, whereas the treatment group’s mean of the proxy for patience does not diverge significantly. This interpretation is supported by t-test results (patience: p-value= 0.59; present bias: p-value= 0.0001). The distributions for impulsivity, our SOEP proxy for present bias, and patience by treatment status are illustrated in Figures 1-2 in Appendix B.

Table 2: Means (standard deviations) for SOEP proxies of present bias and patience according to treatment status

	Present bias	Patience
Control group ( <i>FRG</i> )	5.12 (2.21)	6.10 (2.35)
Treatment group ( <i>GDR</i> )	4.95 (2.11)	6.13 (2.26)

*Notes:* We use SOEP data from 2008 and 2013. SOEP weights are utilized. The numbers of observations are as follows: Present bias & FRG:  $N = 23169$ , present bias & GDR:  $N = 8701$ , patience & FRG:  $N = 23184$ , patience & GDR:  $N = 8695$ .

In attempting to delve deeper using interval regressions<sup>7</sup>, we first turn to the socialist regime’s long-lasting influence on present bias. In our preferred specification, we find that former GDR citizens exhibit significantly lower levels of present bias (Column (1) in Table 3). The sign of the treatment effect is consistent with the idea that institutional aspects of the GDR (such as its massive state-security service) incentivized residents to prioritize self-control.<sup>8</sup> The size of the GDR treatment effect is comparable to that of the gender effect, and the difference between the two is not significantly different from zero. Our main result is unaffected by the inclusion of further covariates (Column (2) in Table 3). In contrast, we do not find a lasting influence of the GDR’s political regime on patience (although the estimated parameter is positive, as expected). Overall, the striking difference in both the size and the statistical significance level of our estimated parameters suggests that a key influence of the very repressive GDR regime on time preferences was that it strongly incentivized self-controlling urges and temptations in the long run.

Matching the results of earlier studies using the natural experiment of the German separation and reunification on the dynamics of the East-West difference (e.g., Brosig et al. 2011,

<sup>7</sup>Using OLS instead yields nearly identical results.

<sup>8</sup>There is strong evidence that people get better at self-control by practicing it (e.g., Muraven forthcoming). This would thus apply to individuals who get to know the GDR regime after its imposition and to the way that they raise their children.

Rainer and Siedler 2009), we find that there is no notable convergence with regard to present bias when considering the five-year lag between 2008 and 2013. More specifically, including an interaction term of GDR and the year 2013 in our specifications from Table 3, we find that there is no change in the estimated parameters of interest and that the coefficient of the interaction term is never significantly different from zero. In order to demonstrate the robustness of our main result for measure of present bias, we next examine various subgroups.

Table 3: Time preferences and the GDR treatment

	(1)	(2)	(3)	(4)
	<b>Present bias</b>	<b>Present bias</b>	<b>Patience</b>	<b>Patience</b>
	Main model	All controls	Main model	All controls
GDR	-0.1801** (0.0433)	-0.1883** (0.0492)	0.0597 (0.0472)	0.0427 (0.0534)
Age	0.0076 (0.0067)	-0.0229* (0.0102)	0.0216** (0.0073)	0.0519** (0.0104)
Age <sup>2</sup>	-0.0002 (0.00006)	0.00005 (0.00009)	-0.0001 (0.00007)	-0.00034** (0.00009)
Male	-0.2389** (0.0387)	-0.3095** (0.0493)	-0.0716 (0.0417)	0.0252 (0.0531)
Raised in a large city	0.2251** (0.0528)	0.2018** (0.0543)	-0.0976 (0.0576)	-0.0533 (0.0594)
Raised in a medium-sized city	0.1331* (0.0577)	0.1065 (0.0595)	0.0392 (0.0600)	0.0222 (0.0632)
Raised in a small city	0.0250 (0.0529)	-0.0324 (0.0541)	-0.0240 (0.0568)	0.0193 (0.0585)
Mother: Low-track secondary school	0.1563 (0.0917)	0.1207 (0.0959)	-0.0731 (0.0953)	-0.0368 (0.0983)
Mother: Intermediate-track secondary school	0.1767 (0.1021)	0.2112* (0.1068)	-0.1445 (0.1088)	-0.1281 (0.1125)
Mother: High-track secondary school	0.0759 (0.1488)	0.1147 (0.1515)	-0.0821 (0.1643)	-0.0284 (0.1720)
Mother: No vocational degree	-0.0748 (0.0754)	-0.0797 (0.0782)	-0.0789 (0.0776)	-0.0874 (0.0792)
Mother: Vocational degree	0.0565 (0.0751)	0.1068 (0.0785)	-0.0939 (0.0782)	-0.1140 (0.0802)
Mother: Technical school degree	-0.1635 (0.1551)	0.0223 (0.1534)	-0.0870 (0.1740)	-0.2015 (0.1896)
Mother: University degree	-0.1994 (0.1653)	-0.1488 (0.1575)	-0.0989 (0.1779)	-0.1269 (0.1864)
Father: Low-track secondary school	-0.1694 (0.0888)	-0.1356 (0.0934)	0.0905 (0.0964)	0.0275 (0.0994)
Father: Intermediate-track secondary school	-0.1970 (0.1026)	-0.1502 (0.1079)	0.0433 (0.1086)	0.0276 (0.1128)
Father: High-track secondary school	-0.1269 (0.1258)	-0.0204 (0.1278)	-0.0237 (0.1351)	-0.1002 (0.1412)
Father: No vocational degree	0.0598 (0.1006)	0.0220 (0.1029)	0.1824 (0.1058)	0.2328* (0.1076)
Father: Vocational degree	0.08377 (0.0803)	0.0548 (0.0833)	0.1157 (0.0852)	0.1109 (0.0884)
Father: Technical school degree	-0.0058 (0.1482)	-0.0984 (0.1509)	0.0745 (0.1855)	0.1523 (0.1879)
Father: University degree	0.0041 (0.1279)	-0.0322 (0.1281)	0.2304 (0.1339)	0.2841 (0.1387)
Constant	5.7089** (0.1918)	6.6300** (0.2652)	5.8074** (0.2081)	5.4003** (0.2811)
Additional controls?	No	Yes	No	Yes
<i>N</i>	31,870	29,212	31,879	29,222
Wald test ( <i>df</i> )	203.33** (21)	361.41** (40)	121.32** (21)	339.41** (40)

*Notes:* We use SOEP data from 2008 and 2013. SOEP weights are utilized. Parameter estimates come from interval regressions. The dependent variable is the SOEP measure for *present bias* and *patience*, respectively. The additional control variables are listed in Table 1. Robust standard errors are clustered at the individual level. *z* statistics in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ . Wald-test with  $H_0$ : no joint significance of all regressors.

### 3.2 Present bias: Duration of regime exposure

We consider the effect of the number of years spent under socialism on present bias by defining four groups according to the respondent’s year of birth and running regressions for each cohort (Columns (1)-(4) in Table 4).<sup>9</sup> The results are consistent with the idea that only a sufficiently long exposure to the GDR’s repressive socialist regime entailed repercussions for citizens’ present bias.

Table 4: Present bias and GDR treatment, by birth cohort

	(1)	(2)	(3)	(4)
	Birth year <46	Birth year 46-60	Birth year 61-75	Birth year 76-89
GDR	-0.2628** (0.0761)	-0.1894* (0.0795)	-0.2965** (0.0954)	0.1912 (0.1044)
<i>N</i>	8,711	9,029	8,556	5,574
Wald test ( <i>df</i> )	103.38** (21)	61.38** (21)	82.32** (21)	57.38** (21)

*Notes:* We use SOEP data from 2008 and 2013. SOEP weights are utilized. Parameter estimates come from interval regressions, using the main model specification. The dependent variable is the SOEP measure for *present bias*. Robust standard errors are clustered at the individual level. *z* statistics in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ . Wald-test with  $H_0$ : no joint significance of all regressors. Full results are documented in Supplementary Materials.

The prior literature has reported similar findings for other economic preferences. For example, Alesina and Fuchs-Schündeln (2007) report that the greater support for a government role is the more pronounced the longer the subject has lived under the socialist regime. Similarly, Heineck and Süßmuth (2013) find that any divergence between East and West Germans with respect to risk preference is more pronounced for older individuals.

### 3.3 Robustness checks for present bias: Smooth transition, regional subsamples, and Big 5 and other economic preferences as covariates

In this section, we present robustness checks that consider different subsamples of the data to establish that we are not merely capturing regional or cultural differences. Moreover, we rerun our regressions including measures of personality traits and other economic preferences. But first, we focus on subgroups that had a relatively “smooth transition” to life in reunified Germany.

East Germany performed much worse economically after the reunification, implying that East Germans experienced markedly higher unemployment rates and lower average income levels, inter alia. Although we control for various aspects of individual employment biographies in

<sup>9</sup>Full results for this regression exercise and those reported below are documented in the Supplementary Material.

our vector of covariates, one might still worry about the impact of post-reunification unobservables. To this end, we consider two subgroups which had a “smooth transition” in economic terms: (i) Individuals born in or before 1935 (as these individuals could sidestep adverse economic reunification experiences by entering retirement at a net replacement rate of at least 65 percent; Börsch-Supan and Schnabel 1999: 159), and (ii) individuals who – during the GDR era – enjoyed a social network with links to the FRG. The information used for identifying subgroup (ii) stems from the very first East German SOEP sample in spring 1990, where participants were asked whether they had relatives or friends in the FRG. It can be established that these subjects were relatively more successful in economic terms after the reunification, as measurable with respect to wages, for example.<sup>10</sup> For both subgroups, our findings indicate a significant effect of the GDR’s political regime on the present bias (Columns (1)-(2) in Table 5).

Table 5: Present bias and GDR treatment: robustness checks

	(1)	(2)	(3)	(4)	(5)	(6)
	Pensioners	West ties	North	South	Protestant	Big 5 & risk preferences
GDR	-0.2690*	-0.2157**	-0.1876**	-0.1885**	-0.1958**	-0.1629**
	(0.1258)	(0.0638)	(0.0600)	(0.0619)	(0.0546)	(0.0505)
<i>N</i>	3,001	26,213	15,791	16,079	15,467	15,000
Wald test ( <i>df</i> )	55.14** (21)	158.18** (21)	95.21** (21)	138.56** (21)	104.46** (21)	1963.55** (21)

*Notes:* We use SOEP data from 2008 and 2013. SOEP weights are utilized. Parameter estimates come from interval regressions, using the main model specification. The dependent variable is the SOEP measure for *present bias*. *South* includes Bavaria, Baden-Württemberg, Hesse, Rhineland-Palatine, Saarland, Saxony, Thuringia. *Protestant* includes Berlin, Brandenburg, Bremen, Hamburg, Hesse, Lower Saxony, Mecklenburg Western-Pomerania, Saxony, Saxony-Anhalt, Schleswig-Holstein, Thuringia. Robust standard errors are clustered at the individual level. *z* statistics in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ . Wald-test with  $H_0$ : no joint significance of all regressors. Full results are documented in Supplementary Materials.

To further check the robustness of our results, we ran regressions for subsamples to verify that we are not merely capturing regional or cultural differences with regard to present bias (see Supplementary Materials for details). First, we split the sample into North and South subsamples, obtaining findings that reproduce our baseline estimates (Columns (3)-(4) in Table 5). Next, in acknowledgement of the fact that East and West Germany are very different in terms of religion, we restrict our sample to regions in both parts of Germany that have clear Protestant majorities, and find that this approach yields very similar results (Column (5) in Table 5). We also ran regressions including district-specific effects for each of the 15 former GDR districts, the results of which do not reveal significant heterogeneity across districts.<sup>11</sup> Finally, we acknowledge that our SOEP-measures for present bias and patience might correlate with personality measures and economic preferences such as risk attitudes. The SOEP wave

<sup>10</sup>The robustness check using subgroup (ii) was motivated by Burchardi and Hassan (2013). They show that West Germans with links into the East also benefited in terms of personal income.

<sup>11</sup>These results are available in our Supplementary Materials.

2013 provides us with information on both individual risk attitudes and the Big-5 inventory. Exploring the results of an empirical model that includes this information, we obtain a GDR coefficient of  $-0.1629^{**}$  and find that both risk preferences and the Big 5 (except for conscientiousness) are significantly correlated with our proxy of present bias (Column (6) in Table 5).

## 4 Conclusion

Time preferences are important to a host of decisions, many of which have key impacts on critical life outcomes (Golsteyn et al. 2014). There is considerable heterogeneity regarding time preferences and relatively little knowledge about the sources of this variety (Falk et al. 2015, Kosse and Pfeiffer 2013).<sup>12</sup> Intergenerational transmission and the institutional environment are likely to play an important role. In this line of inquiry, the present study contributes by exploring whether the GDR’s socialist institutional environment has left a notable footprint with respect to its former citizens’ time preferences.

Our results suggest that – indeed – the GDR’s socialist regime significantly and enduringly diminished the present bias of its former citizens. Significant differences in East and West Germans’ levels of present bias show about two decades after the reunification and the data does not suggest convergence. In contrast, the reported level of patience of former GDR citizens is comparable to that of former FRG citizens. We thus find survey-based evidence indicating that political institutions influence time preferences.

Our finding of an asymmetric influence of the GDR regime’s on patience on the one hand and present bias on the other hand is interesting. This may tentatively be interpreted as suggesting that the very repressive GDR regime strongly incentivized self-controlling urges and temptations, whereas differences in the political regimes of the FRG and the GDR with a bearing on standard discounting were not comparably strong.

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<sup>12</sup>In contrast, the literature on risk attitudes is relatively more mature. See, for instance, Dohmen et al. (2011) and Dohmen et al. (2016).

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## Appendix

### A Exploring the relationship of the SOEP proxy for present bias (impulsivity) and an experimental measure of present bias

In 2006, experiments were conducted with a subsample of the SOEP to elicit their time preferences. In the experiment that we rely upon for our experimental measure of present bias, 526 individuals were asked to indicate their 20 choices from 20 sets of two alternatives, where the alternatives differed in their level of payout and their payout period. The difference in the payout period was fixed at one month. In a first task, participants were presented with the option of either receiving 200 euros immediately or some payment  $x > 200$  euros in one month. In a second task, the decision was between 200 euros in 12 months and some payment  $x > 200$  euros in 13 months. The level of  $x$  took on 20 values that were presented in an ascending order and the subjects were asked to state their choice for each of the 20 sets of two alternatives (Richter and Schupp 2014). After the experiment, a randomly selected subgroup of participants (11%) received 200 euros or a random  $x > 200$  euros depending on their choice in the experiment.

The set of alternatives at which individuals switch from preferring the sooner payment to preferring the later payment gives us their switching point and is interpreted as a point of indifference. We observe valid switching points for 374 participants aged 18 to 80 years. These switching points allow us to calculate an experimental measure of present bias. In a next step, we use an ordinary least squares regression to estimate the correlation between the experimental measure of present bias and our survey proxy for present bias (i.e., the SOEP measure for impulsivity) using age, age squared, and gender as additional covariates. For a subset of 335 of the 374 experiment participants with valid switching points, the SOEP survey in 2008 contains information on our proxy for present bias. The estimated coefficient of the survey measure for present bias is  $-0.0014$  with  $p = 0.030$  (see Table 6 for complete results). Tobit and robust regression exercises yield similar results.

Table 6: Correlation of impulsivity and experimental measure of present bias

	Experimental measure of present bias
Impulsivity	-0.0014** (0.0006)
Age	-0.0007 (0.0006)
Age <sup>2</sup>	0.0000 (0.0000)
Male	0.0004 (0.0029)
Constant	1.0226** (0.0137)
$N$	335
$R^2$	0.02

*Notes:* We use experimental data from 2006 and SOEP survey data from 2008. Parameter estimates come from ordinary least squares regressions. The dependent variable is the experimental measure for *present bias*. Robust standard errors are documented. Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ .

## B Distributions of SOEP proxies by treatment status

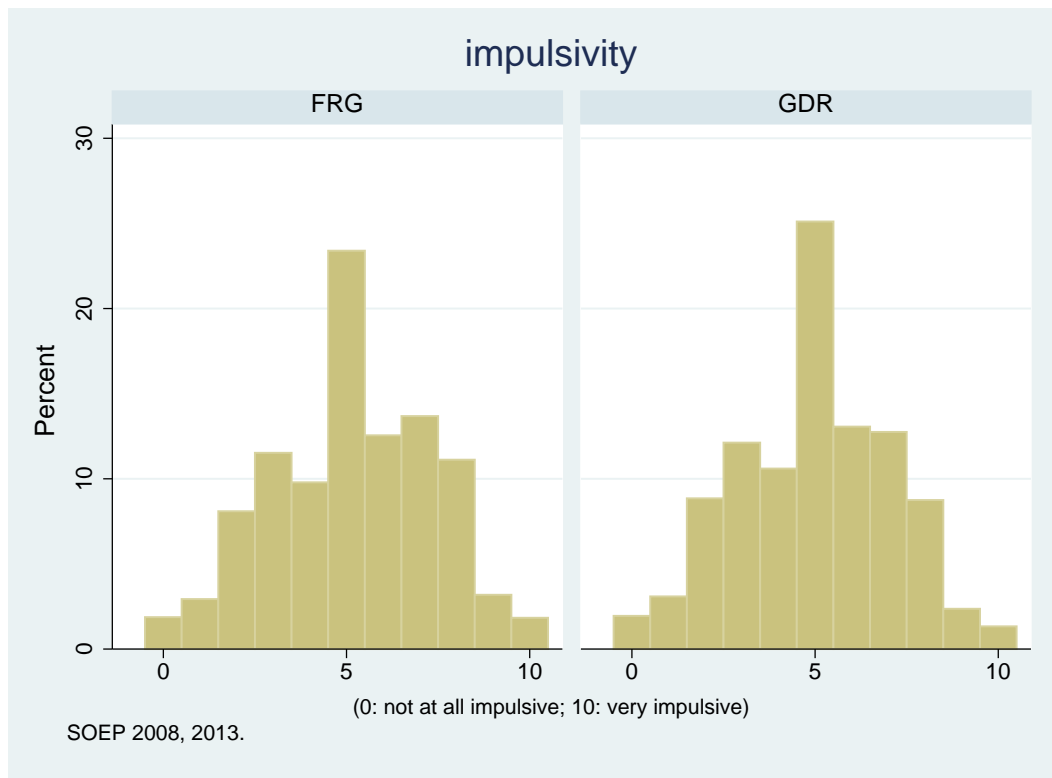


Figure 1: SOEP proxy for impulsivity by treatment status

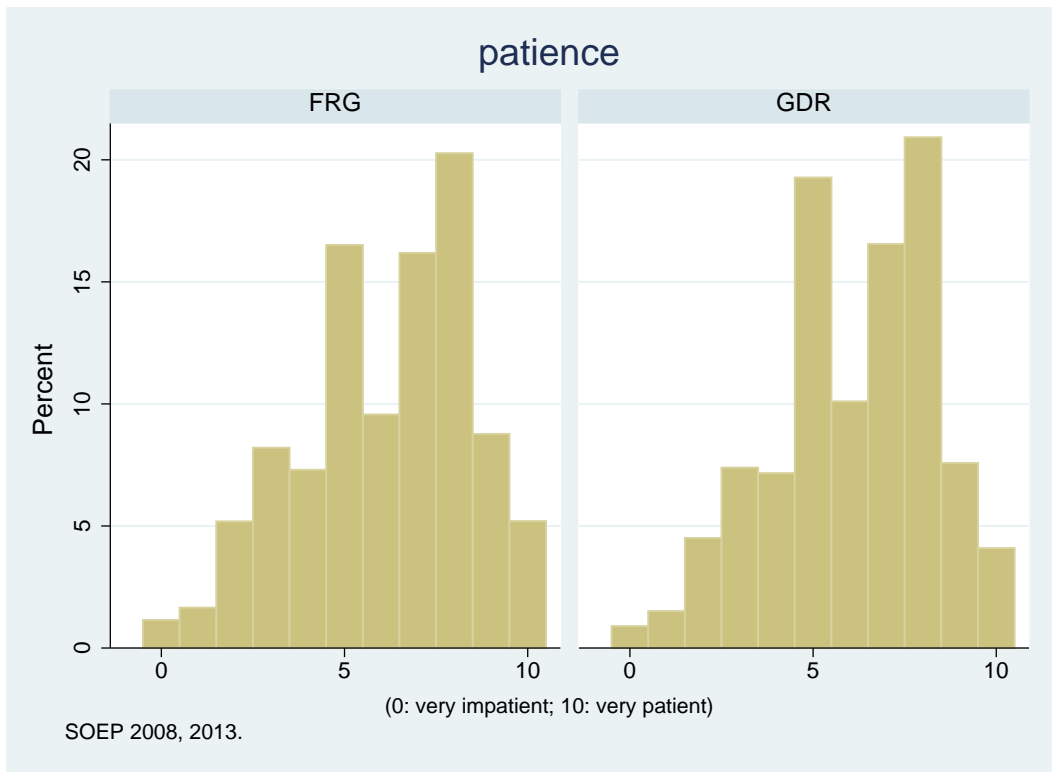


Figure 2: SOEP proxy for patience by treatment status