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The Debt Brake in the Eyes of the German Population

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No. 41-2014

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The Debt Brake in the Eyes of the German Population

Abstract

In response to the recent sovereign debt crisis, the member states of the European Union agreed to enact balanced budget rules in their national legislation. However, little is known about the public's opinion of balanced budget rules. To fill this gap, we conducted a survey among 2,000 representatively chosen German citizens. Our findings suggest that 61% of the German population supports the debt brake, whereas only 8% oppose it. However, approval rates differ notably among various subgroups of the population. The debt brake enjoys greater support among high-income earners and among those well-informed about the future costs of deficit spending. People who do not trust politicians would like to see the government's hands tied even more tightly. Opinions about the debt brake also differ markedly across the supporters of different political parties.

JEL: E02; E62; H62; H63

Keywords: Debt brake; balanced budget rule; European Fiscal Compact; survey; Germany.

1. Introduction

The recent financial crisis and associated economic downturn have imposed a huge burden on the public finances of most developed countries. Between 2007 and 2012, the average debt-to-GDP ratio increased from 59% to 85% in EU countries and from 74% to 111% in OECD countries.¹ This development has driven quite a number of European countries to the brink of insolvency and raised serious concerns about the stability of the euro area. A popular proposal aimed at restoring investor confidence and ensuring sustainable public finances is to limit governments' discretionary leeway by committing to rule-based fiscal policy. Debt brakes are believed to be an especially effective and credible commitment device (e.g., Poterba and Rueben, 2001; Alesina and Bayoumi, 1996). As a response to the sovereign debt crisis, most member states of the European Union signed the European Fiscal Compact, which mandates the enactment of a balanced budget law in their national legislation.²

Debt brakes are not without controversy, however. On the one hand, debt brakes appear to be frequently undermined by creative accounting practices. For example, von Hagen and Wolff (2006) report that EU countries frequently use stock-flow adjustments to hide budget deficits in order to comply with the criteria of the Stability and Growth Pact. Keynesian economists are generally critical of debt brakes, given that this school of thought emphasises the benefits of expansionary fiscal policies, especially during economic downturns (e.g., Hein and Truger, 2013). Warnings about the perils of balanced budget rules are particularly vehement in the context of the European Monetary Union, as fiscal policy remains the only national macroeconomic instrument for offsetting asymmetric shocks across countries. Moreover, balanced budget rules may have an adverse effect on economic growth, as they could trigger huge fluctuations in aggregate economic activity (Schmitt-Grohé and Uribe, 1997).

Germany recently adopted a balanced budget law via constitutional amendment (Art. 109(3) Grundgesetz). From 2016 onward, the public budget deficit at the federal government level must not exceed 0.35% of GDP. Exceptions can be made only in times of economic crises or in the event of a natural disaster. The German state governments (*Bundesländer*) are required to balance their budgets beginning in 2020; the same exceptions applicable at the federal level also apply to at this level of government.

¹ OECD Economic Outlook No. 95.

² Exceptions are the United Kingdom and the Czech Republic, which did not sign the European Fiscal Compact.

There is a large literature evaluating the effectiveness of fiscal rules.³ However, despite the far-reaching consequences debt brakes have for fiscal policy and the potential perils they pose, there is a lack of evidence on how the electorate evaluates debt brakes. A balanced budget rule ties the hands of elected politicians who are supposed to represent their voters' interests and hence also constrains the electorate's scope for decision-making. Thus, people should not be indifferent about the implementation of such a rule. To elicit the German public's attitude toward the debt brake, we designed a survey that was carried out by the GfK, a private survey institute. In the first quarter of 2013, roughly 2,000 German citizens aged at least 14 were interviewed face-to-face with the help of pen pads.

Our findings suggest that a vast majority of the German population supports the balanced budget rule in its current form; the share of proponents is roughly 61%. Only 8% of the respondents oppose a debt brake; 17% do not think that the current debt brake is a strong enough constraint, believing that government should not incur any additional debt at all. Our dataset contains additional information about the respondents, allowing us to examine the correlates of people's attitudes toward the debt brake. Results based on cross-tabulations and multinomial regression analysis indicate that support for the balanced budget rule is stronger among high-income respondents and those well-informed about the costs of deficit spending. People who do not trust politicians would like to see the government's hands tied even more tightly. Opinions about the debt brake also differ notably across the supporters of different political parties. People who vote for the CDU and FDP, for example, are more likely to approve the debt brake in its current form than are non-voters or people who vote for 'fringe' parties. However, hardly any subgroup of the German population opposes introduction of a balanced budget rule in general.

Our paper relates to several studies that use survey data to elicit public attitudes toward fiscal deficits and fiscal consolidation. Hayo and Neumeier (2013), as well as Heinemann and Henninghausen (2012), investigate determinants of individual attitudes toward fiscal consolidation in Germany, Stix (2013) focuses on Austria, and Blinder and Krueger (2004) employ survey data from the United States. However, this strand of the literature evaluates public attitudes toward the *ad hoc* implementation of fiscal consolidation measures. In contrast, debt brakes do not grant much flexibility, as compliance with the rule is mandatory. Thus, supporting consolidation efforts *occasionally* is not the same as opting for a

³ For example, Poterba (1994), Bohn and Inman (1996), and Alesina and Bayoumi (1996) provide evidence for US states, Imbeau and Tellier (2004) for Canada, Perotti and Kontopoulos (2002) and Guichard et al. (2007) for OECD countries, and Hallerberg and von Hagen (1999) as well as de Haan et al. (1999) for EU countries.

rule committing politicians to engage in fiscal policy at all times. To the best of our knowledge, only Blinder and Holtz-Eakin (1984) study people's attitudes toward a balanced budget rule. The authors use data from two public opinion polls conducted in the United States to elicit the population's opinion on a proposed balanced budget amendment to the constitution. However, their dataset contains only a few socio-demographic variables, thus providing only limited insight into the correlates of people's attitudes toward balanced budget rules.

The remainder of this paper is organised as follows. The next section introduces the survey instrument and presents some descriptive statistics; it also contains an examination of the correlates of individual attitudes toward the German debt brake by means of cross-tabulations. Section 3 presents the results of a multinomial logit estimation, which allows us to take potential collinearity between our covariates into account. Section 4 concludes.

2. The German Public's Opinion on the Debt Brake and its Correlates

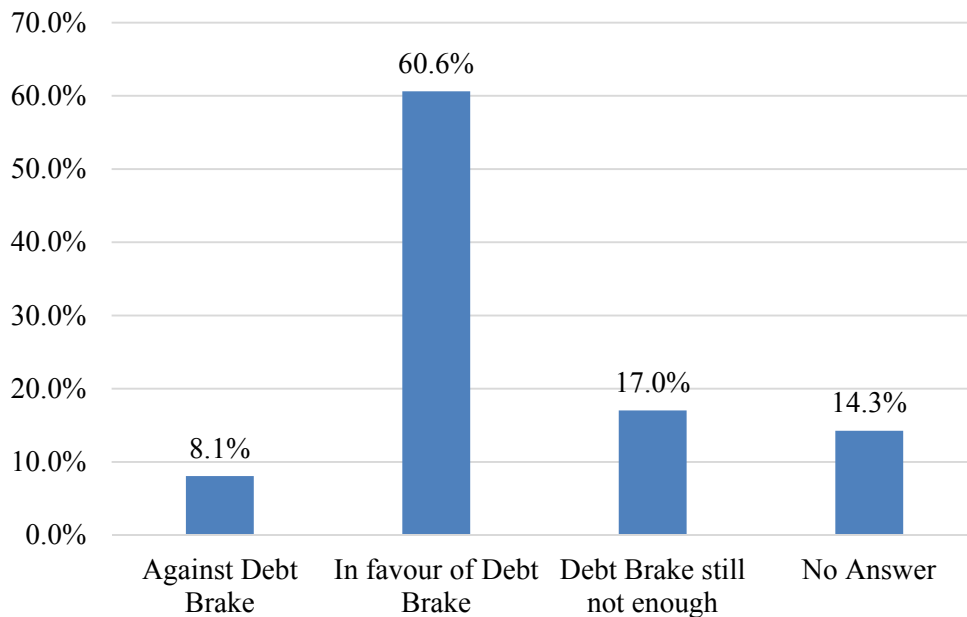
Our survey data are based on a novel questionnaire of our own design that was conducted by the GfK, one of the biggest private survey institutes in Germany. Fieldwork was done in February 2013, at which time a total of 2,042 representatively chosen German citizens aged at least 14 were interviewed face-to-face with the help of pen pads.

As part of the survey, interviewees were asked about their opinion on the German debt brake, which was introduced in 2009 in the form of a constitutional amendment. According to this amendment, the German federal government is not allowed to run an annual structural deficit of more than 0.35% of GDP from 2016 onward. To simplify matters for the respondents, we refrained from using the term 'structural deficit' and from mentioning '0.35% of GDP' when designing the wording of the item. Instead, we stated that the government can take on 'almost no additional public debt'. The English translation of the exact wording of the question is as follows:

In 2016 the federal debt brake comes into force. From this moment on, the federal government can take on almost no additional public debt. Exemptions are allowed only in times of economic crises or natural disasters. What is your opinion on the debt brake?

The respondents could choose between four answers: (1) 'I am against the debt brake—the incurrance of public debt should not be restricted', (2) 'I am in favour of the debt brake in the aforementioned form', (3) 'The debt brake is still not enough—the government should not be allowed to incur public debt at all', or (4) 'Don't know'. Figure 1 illustrates the distribution of answers.

Figure 1: Public attitudes toward the German debt brake—distribution of answers



We find that the German debt brake enjoys wide public support: 61% of our respondents approve the balanced budget rule in its current form and only 8% oppose a balanced budget rule in general; 17% even think that the debt brake does not go far enough, believing that the government should not incur any additional debt. Only 14% have no opinion, indicating high public interest in what is a potentially complicated topic. Thus, the idea of tying the government's hands in order to prevent it from accumulating public debt has many proponents.

However, the aggregate data paint an incomplete picture, as various subgroups of the population may differ with respect to their view on the debt brake. Public debt incurrence can serve very different purposes; it can provide a means to redistribute resources over time and groups of people, it can work to stabilise the business cycle, it can be employed strategically by opportunistic policymakers, and so forth. The public choice and political economy literature makes several conjectures about correlates of people's attitudes toward public debt incurrence. Similarly, attitudes toward a rule compelling the government to balance the budget could vary along similar dimensions, as people may have different opinions about the advantages of discretionary fiscal policy or benefit to different degrees from public debt incurrence. Our dataset allows us to empirically test several of these conjectures, as we also collected socio-demographic information about the respondents. To elicit attitudes toward the debt brake within various subgroups of the German population, we report cross-tabulations

containing conditional distributions of answers. In each case, we also report Pearson's χ^2 to evaluate the statistical significance of the correlations.

2.1. Economic Well-Being

According to Cukierman and Meltzer (1989), public debt incurrence is an instrument for reallocating resources over time or even generations. An interesting conclusion of their analysis is that people who are relatively worse-off may be less reluctant to live at the expense of future generations and more likely to favour deficit spending. Hayford (1989) emphasises the importance of capital market restrictions. In a neo-Ricardian world, public debt is a way for the current generation of consumers to circumvent a binding credit constraint. Arguably, people with low income and low asset endowment are more likely credit constrained and thus more in favour of public debt incurrence. To evaluate the importance of the interviewees' economic situation to their attitudes toward the debt brake, we collected information on (i) the respondent's net monthly household income (in €1,000), (ii) a household's real assets (i.e., a dummy indicating whether the respondent lives in a self-owned flat/house or a rented house/flat), and (iii) the respondent's subjective assessment of his or her economic situation, ranging from 1 (absolutely dissatisfied) to 5 (absolutely satisfied).

Table A1 in the Appendix illustrates the association between attitude toward the debt brake and the respondent's economic situation. To measure the influence of household income, we group our respondents into three categories: low-income households with a net monthly income of less than €1,500; medium-income households with incomes between €1,500 and €3,500; and high-income households with income above €3,500. Our results show that economic well-being increases approval of the debt brake: 55% of low-income respondents support the balanced budget rule; for high-income respondents, the share is 68%. The association with the respondents' subjective assessment of their personal well-being is even stronger. Only 41% of those who state that they are absolutely dissatisfied with their economic situation support the debt brake, whereas those who are satisfied or absolutely satisfied have an approval rate of above 60%. Comparing house owners and renters, we find a similar result: the approval rate for the debt brake is 62% for the former group and 59% for the latter. However, we must emphasise that people reporting low income, no house ownership, or low economic well-being do not generally oppose a balanced budget rule—quite the reverse: they are more likely to opt for an even stricter balanced budget rule that would prevent the government from incurring any additional public debt at all. This is strong

empirical evidence against the hypothesis put forward in the literature that poor people are more prone toward deficit spending.

2.2. Economic Literacy

There is a great deal of evidence in the public choice literature supporting the idea that attitudes toward deficit spending are related to economic literacy. People who suffer from ‘fiscal illusion’, that is, who lack information about the costs associated with public debt incurrence, are believed to be more tolerant of fiscal deficits (e.g., Buchanan and Wagner, 1977). Based on this reasoning, we expect that economically ‘literate’ people are more likely to support a balanced budget rule so as to prevent the government from incurring public debt. To elicit the respondents’ economic literacy, we employed three indicators assessing the interviewees’ knowledge about public-debt-related economic measures. We asked about (i) the size of the federal government’s budget deficit in 2012 (in relation to GDP), (ii) the current interest rate on government bonds with a maturity of 10 years, and (iii) 2012’s inflation rate. In each case, respondents could choose between four answers. As an indicator of the respondents’ degree of economic literacy, we count the number of correct answers. We expect that better-informed respondents are more likely to favour a balanced budget rule, as they have a better understanding of the costs related to public debt incurrence.

In line with our prior, our findings suggest that higher economic literacy is associated with a greater likelihood of supporting the debt brake (see Table A2 in the Appendix). The approval rate among the interviewees who gave one, two, or three correct answers is, respectively, 10 percentage points (pp), 13 pp, and 7 pp larger compared to that of those who gave no correct answer. Thus, the relationship between knowledge and support appears to be nonlinear. About 20% of those who are poorly informed did not express an opinion about the debt brake, indicating that this relationship may be mediated by a lack of political interest. Only one-third of our respondents gave at least two correct answers; given that the expected number of correct answers is one if interviewees simply guess randomly, this result suggests that the public’s knowledge about debt-related economic measures is somewhat weak.

2.3. Believed Fiscal Position

Subjective assessment of economic conditions may play a crucial role in people’s attitude toward the debt brake as people tend to act on the information set they have, at least as long as they believe it to be accurate. Thus, if a person *thinks* that the government is spending beyond its limits and debt-servicing costs are high, she may be more likely to support a debt brake.

We use the answers to the multiple-choice knowledge questions as an indicator for the respondents' *beliefs* about the realisation of debt-related economic measures, irrespective of whether they are actually correct.

The results are outlined in Table A3. The answers to all three multiple-choice questions are significantly related to attitudes toward the debt brake. Respondents who believe the past year's deficit and current interest rate to be particularly large are less likely to oppose the debt brake and more likely to opt for an even stricter balanced budget rule. Only 184 (9%) of our respondents knew that the federal government's budget deficit in 2012 was about 1%, indicating again that German citizens are not well-informed about fiscal policy. The association between attitudes toward the debt brake and the believed inflation rate is less clear. People who falsely believe that 2012's inflation rate was particularly low are less likely to support the debt brake than are those who falsely believe it to equal 5%, but more likely to approve it than those who think it was extraordinarily large (i.e., 10%).

2.4. Time Preferences

According to Barro's (1979) tax-smoothing hypothesis, benevolent governments ought to incur fiscal deficits during recessions and consolidate the public budget in times of economic recovery. However, whether such a course of fiscal policy is in the (representative) voter's interest, strongly depends (inter alia) on her time preferences. The crucial assumption here is that the discount function applied by the (representative) individual to evaluate the welfare effect of future fiscal policies corresponds to the yield curve of government bonds. There are two frequently observed anomalies in intertemporal decision-making that challenge this view. First, people's subjective discount factors between two consecutive periods are typically larger than the corresponding interest rate, indicating that they are less forward-looking than they are assumed to be. Second, people are especially impatient in the short run, commonly referred to as 'myopia' (e.g., Thaler and Shefrin, 1981; Ainslie, 1975). We expect that people who are less forward-looking (i.e., who apply lower discount rates) and particularly impatient in the short run show will be less supportive of a balanced budget rule (cf. Huber and Runkel, 2008).

The survey contained two experiments that allow us to assess the interviewees' time preferences.⁴ In the first experiment, respondents were asked to choose between a safe payoff

⁴ A detailed description of these experiments is provided in Hayo et al. (2014). The setup and wording of the experiments are taken from the questionnaire of the German Socioeconomic Panel (SOEP), where the experiment was incentivised. Since the distribution of answers in our data is very similar to the one in the SOEP

of €1,000 paid immediately and a higher payoff of € $X_{i,6}$ paid in six months. In the second experiment, the choice is between a safe payoff of €1,000 paid in six months and a higher payoff of € $X_{i,12}$ paid in 12 months. The respondents' choices of $X_{i,6}$ and $X_{i,12}$ are then used to compute (i) the marginal rate of intertemporal substitution between two consecutive future periods, i.e., $\beta = 1,000/X_{i,12}$, and (ii) the respondents' degree of short-run impatience, defined as $\delta = X_{i,12}/X_{i,6}$ (cf. Angeletos et al., 2001; Laibson, 1997).

In Table A4 of the Appendix, we sort respondents based on their degree of forward-lookingness, differentiating between low ($\beta \leq 0.5$), medium ($0.5 < \beta \leq 0.9$), and high ($\beta > 0.9$) future orientation. We further discriminate between myopic ($\delta < 1$) and non-myopic ($\delta \geq 1$) respondents, depending on the realisation of δ . A comparison of the distribution of answers by these groups reveals no clear association between time preference and attitude toward the debt brake. Respondents with a medium degree of future orientation are more likely to support the debt brake than those with low or high future orientation and less likely to state that the debt brake is not sufficient. The relationship between our indicator for myopia and attitudes toward the debt brake is statistically insignificant.

2.5. Risk Attitudes

Critics of debt brakes often emphasise that lack of sufficient fiscal leeway may limit the government's scope for fiscal stimuli during economic downturns. The disadvantages of balanced budget rules are believed to be particularly severe in the context of the European Monetary Union, as fiscal policy is the only national macroeconomic instrument for offsetting asymmetric shocks (e.g., Hein and Truger, 2013). Arguably, perception of the perils of a debt brake may be related to people's risk attitudes. People who are highly risk averse, and thus likely to be more concerned about adverse economic shocks, might regard sufficient fiscal leeway as relatively more important. We thus expect that risk-averse people are more likely to oppose a debt brake or favour a less strict balanced budget rule, whereas those who are relatively risk prone ought to be more supportive of the notion that the German debt brake is insufficient.

We assessed the interviewees' risk attitudes by conducting a simple experiment. Respondents were confronted with the choice of either receiving a safe payoff of € X or taking part in a lottery in which they could win either €1,000 or nothing. The odds are 50:50. The

data, we are confident that the lack of a material incentive in our version of the experiment had no notable effect on the respondents' choices.

choice of X is then used to compute a measure of the respondent's risk attitude λ , ranging from -1 (maximum risk aversion) to $+1$ (maximum risk propensity).⁵

In Table A5 in the Appendix, we sort the respondents into three categories: respondents with a risk attitude parameter λ of less than -0.2 are considered to be risk averse, those with a parameter value between -0.2 and 0.2 are risk neutral, and those with a value of λ of larger than 0.2 are risk prone. Our findings indeed suggest that people who can be considered as particularly risk prone are more likely to agree with the notion that the government should not incur any additional debt at all. The share of respondents who agree with this view is 26% among the risk prone and 15% among the risk averse. In contrast, 65% of risk-averse interviewees support the debt brake in its actual form, whereas the share of proponents among the risk-prone interviewees is only 56%.

2.6. *Trust in Politicians*

Trust in politicians could be a particularly important determinant of individual attitudes toward fiscal rules. Several political economy approaches assume that public debt is used as a strategic instrument by opportunistic policymakers to pursue selfish interests.⁶ Arguably, voters suspicious of politicians' motives are more likely to prefer fiscal rules over discretionary leeway and thus be in favour of a balanced budget rule. We sought to capture different dimensions of trust in politicians by confronting the interviewees with three sets of contradictory statements. Specifically, we asked the respondents whether they believe that politicians (i) act according to the general public interest vs. only in the interest of particular groups, (ii) are concerned about the country's long-term well-being vs. only care about winning the next election, and (iii) manage tax revenues conscientiously vs. are wasteful with tax revenues. In each case, the interviewees were asked to use a five-point scale to indicate with which statement they most agree. The scale ranges from $+2$ (indicating strong agreement with the positive statement) to -2 (indicating strong agreement with the negative statement).

To evaluate the association between *trust in politicians* and approval of the debt brake, we compute an average trust score for each respondent. We consider an average trust score of equal or less than -1 as low, a score between -1 and $+1$ as medium, and a score equal or larger than $+1$ as high. Table A6 shows the relationship between trust in politicians and attitudes toward the debt brake. In line with our expectations, the distribution of answers

⁵ The risk attitude parameter λ is computed as $(X-500)/500$.

⁶ Such approaches include political budget cycle theory and rent-seeking approaches, as well as work by Persson and Svensson (1989) and Alesina and Tabellini (1990), in which the government is expected to have time-inconsistent preferences.

suggests that people characterised by low trust in politicians tend to regard the current balanced budget rule as insufficient; 20% of these respondents opt for a rule that prevents the government from incurring any debt at all. In comparison, the share interviewees with medium (high) trust who agree with this notion is 12% (16%).

When looking at each trust measure separately, we find a particularly strong association between attitudes toward the debt brake and the first trust measure, that is, the notion that politicians are concerned about the general public interest vs. the interest of particular groups.⁷ Twenty per cent of the interviewees who (rather) believe in interest-group politicians would like an even stricter balanced budget rule, whereas the share among those who believe that politicians are benevolent is only 13%.

2.7. Party Preferences

Political ideology appears to be an important determinant of individual attitudes toward various policy measures. In Germany, the introduction of the debt brake was a source of avid public debate, with supporters and opponents typically belonging to different political camps. In fact, the political parties in Germany have very different opinions about the perils and benefits of a balanced budget rule. The conservative Christian Democratic Party and the Liberal Democratic Party favour the debt brake; the Leftist party strictly opposes it. Although the Social Democratic Party and the Green Party officially support the debt brake, there are opponents among the members of both parties. To glean some insight into the association between party preferences and attitudes toward the German balanced budget rule, all respondents were asked which party they would vote for if elections were held next Sunday. The respondents could choose between seven major German parties: the Social Democratic Party (SPD), the Christian Democratic Party (CDU), the Leftist Party, the Green Party, the Pirates, the Liberal Democratic Party (FDP), and the National Democratic Party of Germany (NPD). Alternatively, the respondents could state that they would vote for a different party or not vote at all.

Table A7 in the Appendix sets out the correlations between *party preferences* and attitudes toward the debt brake. People who vote for the parties regularly represented in the federal parliament reveal greater support for the current balanced budget rule. The support is the greatest among those who vote for the rather conservative CDU (70%), followed by the Green Party (65%), the SPD (63%), and the liberal FDP (63%). In contrast, people who vote

⁷ Results are not reported here but available on request.

for parties other than those listed are more likely to want to tie the hands of politicians even more tightly by forbidding any additional debt incurrence. Interestingly, less than 8% of Leftist Party supporters are explicitly against the debt brake even though the Leftist Party officially rejects a balanced budget rule. This share is smaller than for most of the parties that officially support the debt brake, for example, the CDU (9%), the SPD (9%), and the Green Party (9%). Moreover, 23% of leftist voters call for an even stricter debt brake. There are two possible explanations for this. First, the Leftist Party's positions are far from the political 'mainstream' and the party is strongly critical of both past and present government. Thus, people who vote for the Leftist Party may desire to see the government's hands tied by a balanced budget rule. Second, the Leftist Party constantly calls for expansion of the welfare state and also tends to make political demands that far outpace budget limits. Thus, it could be that its supporters fear that the Leftist Party is incapable of engaging in sound fiscal policy, which is why they are in favour of a binding public credit constraint.

To sum up, despite the fact that support for the debt brake differs notably across different subgroups of the population, there is hardly any group that generally opposes a balanced budget rule. Within each subgroup, approval of the debt brake in its current form is typically the modal value. Nonetheless, approval rates can vary as much as 20 pp across subsamples. There is more disagreement about whether the German debt brake is sufficiently strong or whether the hands of the government should be tied even more tightly by prohibiting any additional debt incurrence at all.

3. Regression Analysis

Although cross-tabulations are very useful because they do not require assumptions about the functional relationship between variables, they do not have a *ceteris paribus* interpretation, as we do not take the joint variation of the covariates into consideration. In this section, we account for potential collinear relationships between our covariates by means of regression analysis. For this purpose, we estimate a multinomial logit model:

$$(1) \Pr(y_i = k) = \frac{\exp\{x_i' \beta_k\}}{\exp\{x_i' \beta_1\} + \dots + \exp\{x_i' \beta_K\}}, k = 1, \dots, K.$$

k refers to the potential realisations of the discrete variable y_i , which can take on three values: 1 if the respondent is against the debt brake, 2 if she favours it, and 3 if she thinks that the debt brake is insufficient. Subscript i refers to the interviewee. We estimate the coefficients β_k using maximum likelihood.

The vector x contains all variables introduced in Section 3: economic situation,⁸ economic literacy, believed fiscal position, time preferences,⁹ risk preferences, trust in politicians,¹⁰ and party preferences. Moreover, we control for several additional factors, namely, level of education (dummies for those who completed lower (Hauptschule; reference category), middle (Realschule), and upper secondary school (Abitur)), dummies for employment status (regularly employed (reference category), unemployed, student, retiree, trainee/military service, and jobless for other reasons), marital status (singles (reference category), people living together with a partner, married people, and those who are widowed or divorced), age, sex, propensity toward an egalitarian attitude, and a dummy indicating whether the respondent has children.¹¹ Additionally, we include a dummy for the state (Bundesland) in which the respondent resides. The results are outlined in Table 1. Since the coefficients of a multinomial logit model are of limited interpretative value, we report average marginal effects for each realisation of our dependent variable. Generally, it appears that a number of conclusions based on the bivariate analyses in Section 3 are affected by common variation in our explanatory variables and no longer hold in a multivariate context.

Among the group of *economic controls*, only household income reveals a statistically significant influence on individual attitudes toward the debt brake when holding other factors fixed. In line with our findings from the bivariate analysis, the larger the respondent's income, the lower the likelihood that she opts for an even stricter balanced budget rule. A €1,000 increase in household income is associated with an almost 3 pp lower likelihood of answering that the government should not incur any additional debt at all.

⁸ Unlike in the cross-tabulations, we do not group the respondents into three different income brackets in the regression approach; instead, household income enters as a metric variable.

⁹ In our sample, a large number of interviewees choose the immediate payment irrespective of the magnitude of the offered future payoff. Interestingly, a similar distribution of answers is found in the SOEP. A possible explanation for this finding is that respondents who are particularly risk averse choose this option. To control for possible spill-over effects and measurement errors, we include additional dummy variables for these categories.

¹⁰ Note that we include each trust measure separately instead of computing the average as done in Section 2.

¹¹ A detailed description of all variables is provided in Section A.2 of the Appendix.

Table 1: Determinants of individual attitudes toward the German debt brake.

Variables	Against Debt Brake	Pro Debt Brake	Debt Brake Not Enough
<i>Economic situation</i>			
HH income	0.007	0.019	-0.027**
Subjective well-being	0.004	0.005	-0.009
Property	-0.017	-0.005	0.022
<i>Time preferences</i>			
β	-0.058	0.012	0.046
δ	-0.034	-0.016	0.051
<i>Risk attitudes</i>			
λ	0.016	-0.059***	0.043***
<i>Economic literacy</i>			
One correct answer	-0.073**	0.062	0.011
Two correct answers	-0.081**	0.075	0.006
Three correct answers	-0.049	0.080	-0.032
Believed deficit	-0.006	0.005	0.001
Believed interest rate	-0.005	0.007	-0.003
Believed inflation rate	-0.008*	0.003	0.004
<i>Political trust/attitudes</i>			
Public interest	-0.001	0.029**	-0.028**
Long-term orientation	0.000	-0.004	0.004
Fiscal competence	0.000	0.013	-0.013
<i>Party preference</i>			
Leftist Party	-0.044	-0.043	0.087*
Pirates	-0.043	0.012	0.030
SPD	-0.034	0.012	0.022
Green Party	-0.035	0.009	0.026
CDU	-0.043*	0.062*	-0.019
FDP	-0.054	0.029	0.025
NPD	0.030	-0.139	0.109
Other	-0.042	-0.101*	0.143***
<i>Education</i>			
Middle second. school	-0.003	-0.027	0.030
Higher second. school	0.011	-0.046	0.035
<i>Employment</i>			
Unemployed	0.052	-0.018	-0.035
Retired	0.006	0.026	-0.032
Student	-0.054	0.006	0.049
Voc. training/military service	-0.041*	-0.041	0.082
Housewife/househusband	-0.031	-0.006	0.037
<i>Other controls</i>			
Age	-0.002	-0.001	0.002**
Children	-0.001	-0.019	0.020
Female	0.001	0.025	-0.026
Egalitarian attitude	0.010	0.023**	-0.033***
Living in partnership	-0.007	-0.012	0.019
Married	0.027	-0.021	-0.006
Divorced/widowed	0.057*	-0.091*	0.034
Dummy β	-0.036**	-0.008	0.044
Dummy δ	-0.010	0.041	-0.030
Laender dummies	yes	yes	yes
Observations	1751		
Pseudo-R ²	0.070		
Wald χ^2 (108)	2053.5***		

Notes: Results are based on a multinomial logit maximum likelihood estimation. Marginal effects based on sample averages are reported. White (1980) robust standard errors are used. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Economic literacy appears to matter a great deal, even after controlling for the influence of several other potentially relevant factors. Respondents who have at least some knowledge about debt-related economic indicators are less likely to be opposed to a balanced budget rule. The effects are of notable size. Giving one (two) correct answers to the three multiple-choice questions reduces the likelihood of expressing disagreement with the debt brake by 7 pp (8 pp). In contrast, the *subjective assessment* of debt-related economic measures hardly matters. Only the believed inflation rate is significantly related to attitudes toward the debt brake: a 1 pp increase in the subjective assessment of the inflation rate lowers the likelihood of opposing the debt brake by almost 1 pp.

In line with the findings from cross-tabulations, people who are particularly *risk prone* are less likely to agree to the current balanced budget rule and more likely to opt for an even stricter one than people who are risk averse. The size of the effects is remarkable. A one point hike in the risk attitude parameter λ is associated with a 6 pp lower likelihood of supporting the balanced budget rule and a 4 pp higher likelihood of wanting an even stricter rule.

Among the indicators of *trust in politicians*, beliefs about politicians' benevolence appear to be important. Supporting our prior, a one point hike in this trust measure decreases the probability of choosing an even stricter balanced budget rule by almost 3 pp. Put differently, interviewees who think that politicians primarily serve the interests of particular groups are more likely to express the opinion that the government should not be allowed to incur any debt at all. The reverse is discovered for respondents who have high trust in politicians: they are significantly more likely to support the debt brake in its current form.

With respect to *party preferences*, particularly strong effects are found for supporters of the Leftist Party, the CDU, and other parties not explicitly listed. Supporters of the Christian Democratic Party are 4 pp less likely to oppose the debt brake, which is in line with our expectations. As already indicated by the cross-tabulations, supporters of the Leftist Party are 9 pp more likely to state that the government should not be allowed to run a deficit at all. Finally, supporters of parties other than those listed prefer an even stricter balanced budget rule with a 14 pp higher likelihood. This finding could indicate that those who desire a balanced budget rule the most tend to be disappointed by the fiscal policy programmes of the established parties.

4. Conclusion

The recent financial crisis and associated economic downturn have imposed a huge burden on the public finances of many countries, as public debt levels have increased excessively. This

development has raised concerns about the solvency of many sovereigns and the stability of the Euro area.

To tackle these problems, the member states of the European Union signed the European Fiscal Compact, under which all ratifiers must enact a balanced budget law in their national legislation. Debt brakes are often regarded as an effective and credible device for ensuring sustainable fiscal policy and regaining credibility. However, debt brakes are not without their critics, who point out that because debt brakes tie the hands of fiscal policymakers, they can hinder, if not block, appropriate and timely response to economic downturns. Moreover, the rules can be circumvented by ‘creative accounting’ within the government sector.

To shed light on the public’s view of balanced budget rules, we designed a survey that was carried out in Germany at the beginning of 2013. A representative sample of the German population was asked their opinions on the debt brake. Germany is a particularly interesting case, as a balanced budget rule was enacted by constitutional amendment even before the surge of the European debt crisis. According to this rule, the public budget deficit at the federal government level must not exceed 0.35% of GDP from 2016 onward. Exceptions can be made only in times of national economic crisis or in the event of a natural disaster.

Our findings suggest that a vast majority of the German population supports the balanced budget rule in its current form; the share of proponents is roughly 61%. Only 8% of the respondents oppose a debt brake; 17% think that the debt brake does not go far enough, as they believe that the government should not incur any additional debt at all. Studying approval rates within different subgroups of the German population, we find that attitudes toward the debt brake are associated with several factors. Support for the balanced budget rule is greater among high-income earners, those who are well-informed about the costs associated with deficit spending, and respondents who consider politicians to be trustworthy. Opinions about the debt brake also differ notably across the supporters of different political camps. People who vote for the CDU and FDP, for example, are more likely to approve the debt brake in its current form than are non-voters or those who vote for ‘fringe’ parties. However, no identifiable subgroup of the German population opposes introduction of a balanced budget rule in general.

To conclude, our results imply that the German population strongly supports a rule that constrains the government’s fiscal leeway and, thus, the discretionary power of the voters’ representatives. What remains unclear, however, is the extent to which the financial

and economic crisis and the associated increase in public debt has strengthened the popularity of a debt brake in Germany.

Appendix

A.1. Additional Tables

Table A1: Attitudes toward debt brake and economic well-being—joint distribution of answers

	Against debt brake	In favour of debt brake	Debt brake not sufficient	No answer	Total
Low income (< €1,500)	8.5	54.6	19.3	17.7	100 N = 493
Medium income (bet. €1,500 and €3,000)	7.7	61.4	17.2	13.8	100 N = 1264
High income (> €3,500)	9.1	67.7	12.6	10.5	100 N = 285
Pearson's χ^2 (8)	17.9***				
Absolutely dissatisfied	9.3	41.2	28.7	20.2	100 N = 129
Rather dissatisfied	9.0	58.3	19.0	13.8	100 N = 290
Neither/nor	7.3	62.1	13.7	16.9	100 N = 765
Rather satisfied	8.6	63.3	17.6	10.5	100 N = 712
Absolutely satisfied	6.9	61.0	17.8	14.4	100 N = 146
Pearson's χ^2 (12)	40.2***				
No self-owned house/flat	9.1	59.1	16.1	15.7	100 N = 966
Self-owned house/flat	7.2	62.0	17.9	12.9	100 N = 1076
Pearson's χ^2 (3)	7.0*				

Table A2: Attitudes toward debt brake and economic literacy—joint distribution of answers

	Against debt brake	In favour of debt brake	Debt brake not sufficient	No answer	Total
No correct answer	9.5	52.8	17.5	20.2	100 N = 515
One correct answer	7.0	62.3	17.2	13.6	100 N = 906
Two correct answers	7.8	65.6	17.2	9.5	100 N = 529
Three correct answers	13.0	59.8	12.0	15.2	100 N = 92
Pearson's χ^2 (9)	36.5***				

Table A3: Attitudes toward debt brake and believed fiscal position—joint distribution of answers

	Against debt brake	In favour of debt brake	Debt brake not sufficient	No answer	Total
Deficit = 1%	9.2	62.5	12.5	15.8	100 N = 184
Deficit = 3%	8.8	61.9	17.7	11.6	100 N = 874
Deficit = 5%	7.9	59.6	16.3	16.2	100 N = 643
Deficit = 7%	5.9	58.4	19.1	16.7	100 N = 341
Pearson's χ^2 (9)	15.1*				
Interest rate = 1.5%	8.1	63.6	17.6	10.8	100 N = 758
Interest rate = 3%	8.6	59.8	17.5	14.1	100 N = 766
Interest rate = 5.5%	7.5	59.6	15.0	17.8	100 N = 426
Interest rate = 10%	6.5	47.8	18.5	27.2	100 N = 92
Pearson's χ^2 (9)	26.7***				
Inflation = 0%	6.5	48.4	19.4	25.8	100 N = 31
Inflation = 2%	7.9	63.6	16.6	11.9	100 N = 1298
Inflation = 5%	9.2	58.0	16.7	16.0	100 N = 586
Inflation = 10%	4.7	44.9	22.8	27.6	100 N = 127
Pearson's χ^2 (9)	39.4***				

Table A4: Attitudes toward debt brake and time preferences—joint distribution of answers

	Against debt brake	In favour of debt brake	Debt brake not sufficient	No answer	Total
Low future orientation ($\beta \leq .5$)	7.8	59.8	18.0	14.4	100 N = 1269
Medium future orientation ($.5 < \beta \leq .9$)	9.5	65.4	12.7	12.5	100 N = 505
High future orientation ($\beta > .9$)	6.7	55.6	20.9	16.8	100 N = 268
Pearson's χ^2 (6)	16.1**				
Myopic ($\delta < 1$)	7.8	56.5	20.1	15.7	100 N = 294
Non-myopic ($\delta \geq 1$)	8.1	61.3	16.5	14.0	100 N = 1748
Pearson's χ^2 (3)	3.3				

Table A5: Attitudes toward debt brake and public indebtedness—joint distribution of answers

	Against debt brake	In favour of debt brake	Debt brake not sufficient	No answer	Total
Risk averse ($\lambda < -.2$)	7.5	65.0	15.2	12.3	100 N = 738
Risk neutral ($-.2 \leq \lambda \leq .2$)	8.6	60.6	15.0	15.8	100 N = 581
Risk prone ($\lambda > .2$)	8.3	56.2	20.6	14.9	100 N = 723
Pearson's χ^2 (6)	16.9**				

Table A6: Attitudes toward debt brake and trust in politicians—joint distribution of answers

	Against debt brake	In favour of debt brake	Debt brake not sufficient	No answer	Total
Low trust	8.6	58.5	20.8	12.2	100 N = 1119
Medium trust	7.8	63.4	12.2	16.7	100 N = 839
High trust	4.8	61.9	15.5	17.9	100 N = 84
Pearson's χ^2 (6)	32.5***				

Table A7: Attitudes toward debt brake and party preferences—joint distribution of answers

	Against debt brake	In favour of debt brake	Debt brake not sufficient	No answer	Total
Would not vote	9.6	51.9	14.6	24.0	100 N = 459
Leftist Party	7.5	53.3	23.3	15.8	100 N = 120
Pirates	8.6	51.4	17.1	22.9	100 N = 35
SPD	8.5	63.3	17.3	10.9	100 N = 496
Green Party	8.5	65.0	15.7	10.4	100 N = 280
CDU	8.9	69.5	14.2	9.8	100 N = 459
FDP	6.5	63.2	18.4	13.2	100 N = 76
NPD	5.3	47.4	36.8	5.3	100 N = 19
Other	6.1	46.9	31.6	15.3	100 N = 98
Pearson's χ^2 (24)	93.4***				

A.2. Explanatory Variables

HH income	Monthly net household income in €1,000. In the raw dataset, households are sorted into one of 11 income classes. In the empirical analysis, we consider the centre of each class.			
Subjective well-being	Subjective assessment of personal economic well-being, ranging from 1 (absolutely dissatisfied) to 5 (absolutely satisfied).			
Property	Dummy variable taking the value 1 if the respondent lives in her own house/flat and 0 if the house/flat is rented.			
β	Respondent's marginal rate of substitution between two future consecutive periods (see Section 2.4. and Hayo et al. (2014)).			
δ	Measure of the degree of the respondent's short-run impatience (see Section 2.4 and Hayo et al. (2014)).			
Believed deficit	Measure of the respondent's assessment of 2012's federal budget deficit (four potential realisations; measured in percentage points). This variable is computed based on the following question: How large was the budget deficit of the federal government in 2012?			
	1% <input type="checkbox"/>	3% <input type="checkbox"/>	5% <input type="checkbox"/>	7% <input type="checkbox"/>
Believed interest rate	Measure of the respondent's assessment of the interest rate on government bonds with a maturity of 10 years (four potential realisations; measured in percentage points). This variable is computed based on the following question: What is the current interest rate on long-term government bonds (maturity 10 years), approximately?			
	1.5% <input type="checkbox"/>	3% <input type="checkbox"/>	5.5% <input type="checkbox"/>	10% <input type="checkbox"/>
Believed inflation rate	Measure of the respondent's assessment of 2012's inflation rate (four potential realisations; measured in percentage points). This variable is computed based on the following question: How large was the inflation rate in 2012, approximately?			
	0% <input type="checkbox"/>	2% <input type="checkbox"/>	5% <input type="checkbox"/>	10% <input type="checkbox"/>
Knowledge/number of correct answers	Variable measuring the number of correct answers to the three multiple-choice questions about 2012's deficit, the interest rate on government bonds, and 2012's inflation rate.			
Public interest	Most politicians in Germany act in line with the general public's interest	vs.	Most politicians in Germany only serve the interests of particular groups	
	+2: <input type="checkbox"/> +1: <input type="checkbox"/>	0: <input type="checkbox"/>	-1: <input type="checkbox"/> -2: <input type="checkbox"/>	
Long-term orientation	Most politicians are concerned about the country's long-term well-being	vs.	Most politicians are only concerned about the next elections	
	+2: <input type="checkbox"/> +1: <input type="checkbox"/>	0: <input type="checkbox"/>	-1: <input type="checkbox"/> -2: <input type="checkbox"/>	
Fiscal competence	The government manages tax revenues conscientiously	vs.	The government wastes tax revenues	
	+2: <input type="checkbox"/> +1: <input type="checkbox"/>	0: <input type="checkbox"/>	-1: <input type="checkbox"/> -2: <input type="checkbox"/>	

Egalitarian attitude	The state should ensure equal living conditions +2: <input type="checkbox"/> +1: <input type="checkbox"/> 0: <input type="checkbox"/> -1: <input type="checkbox"/> -2: <input type="checkbox"/>	vs.	The state should not interfere with people's living conditions
Education	Education level of the respondent, differentiating between lower secondary education (reference category), middle secondary education, and upper secondary education.		
Employment	Employment status of the respondent, differentiating between regularly employed (reference category), unemployed, retired, student, housewife/househusband, and jobless for other reasons.		
Age	Respondent's age in years.		
Children	Dummy variable taking the value 1 if the respondent has children (0 otherwise).		
Female	Dummy variable taking the value 1 if the respondent is female (0 otherwise).		
East German	Dummy variable taking the value 1 if the respondent lives in East Germany (0 otherwise).		
Risk preference	Respondents are confronted with the choice of either receiving a safe payoff of €X or taking part in a lottery in which they could win either €1,000 or nothing (odds are 50:50). The choice of X is then used to compute an individual's risk preference parameter, which varies between -1 (maximum risk aversion) and +1 (maximum risk propensity), i.e., $\lambda = (X-500)/500$.		
Family status	Family status of respondent, differentiating between single (reference category), living together with a partner, married, and divorced/widowed.		

References

- Ainslie, G. (1975), Specious reward: A behavioral theory of impulsiveness and impulse control, *Psychological Bulletin* 82, 463–496.
- Alesina, A. and Bayoumi, T. (1996), The costs and benefits of fiscal rules: Evidence from US states, *NBER Working Paper* No. 5614.
- Alesina, A. and Tabellini, G. (1990), A positive theory of fiscal deficits and government debt, *Review of Economic Studies* 57, 403–414.
- Angeletos, G.-M., Laibson, D., Repetto, A., Tobacman, J., and Weinberg, S. (2001), The hyperbolic consumption model: Calibration, simulation, and empirical evaluation, *Journal of Economic Perspectives* 15, 47–68.
- Barro, R. (1979), On the determination of public debt, *Journal of Political Economy* 87, 940–971.
- Blinder, A. S. and Holtz-Eakin, D. (1984), Public opinion and the balanced budget, *American Economic Review Papers and Proceedings* 74, 144–149.
- Blinder, A. S. and Krueger, A. B. (2004), What does the public know about economic policy, and how does it know it? *Brookings Papers in Economic Activity* 1, 327–397.
- Bohn, H. and Inman, R. P. (1996), Balanced budget rules and public deficits: Evidence from the U.S. states, *NBER Working Paper* No. 5533.
- Buchanan, J. M. and Wagner, R. E. (1977), *Democracy in deficit: The political legacy of Lord Keynes*, New York: Academic Press.
- Cukierman, A. and Meltzer, A. H. (1989), A political theory of government debt and deficits in a neo-Ricardian framework, *American Economic Review* 79, 713–732.
- De Haan, J., Moessen, W., and Volkerink, B. (1999), Budgetary procedures aspects and changes: New evidence for some European countries, in: Poterba, J. M. and von Hagen, J. (eds.), *Fiscal institutions and fiscal performance*, Chicago, IL: University of Chicago Press, 265–300.
- Guichard, S., Kennedy, M., Wurzel, E. and André, C. (2007), What promotes fiscal consolidation: OECD country experiences, *OECD Economics Department Working Paper* No. 553.
- Hallerberg, M. and von Hagen, J. (1999), Electoral institutions, cabinet negotiations, and budget deficits in the European Union, in: Poterba, J. M. and von Hagen, J. (eds.), *Fiscal institutions and fiscal performance*, Chicago, IL: University of Chicago Press, 265–300.

- Hayford, M. (1989), Liquidity constraints and the Ricardian equivalence theorem, *Journal of Money, Credit, and Banking* 21, 380–387.
- Hayo, B. and Neumeier, F. (2013), Public attitudes toward fiscal consolidation: Evidence from a representative German population survey, *MAGKS Discussion Paper* No. 51-2013.
- Hayo, B., Neumeier, F., and Uhl, M. (2014), Topics in fiscal policy: Evidence from a representative survey of the German population, *MAGKS Discussion Paper* No. 12-2014.
- Hein, E. and Truger, A. (2013), Fiscal policy and rebalancing in the euro area: A critique of the German debt brake from a post-Keynesian perspective, *Levy Economics Institute Working Paper* No. 776.
- Heinemann, F. and Henninghausen, T. (2012), Understanding public debt preferences, *Public Finance Analysis* 68, 406–430.
- Huber, B. and Runkel, M. (2008), Hyperbolic discounting, public debt and balanced budget rules, *Scottish Journal of Political Economy* 55, 543–560.
- Imbeau, L. and Tellier, G. (2004), The political-economy of budget deficits in the Canadian provinces, 1968–2000, in: Imbeau, L. and Pétry, F. (eds.), *Politics, institutions, and fiscal policy: Deficits and surpluses in federated states*, Lanham, MD: Lexington Books.
- Laibson, D. (1997), Golden eggs and hyperbolic discounting, *Quarterly Journal of Economics* 112, 443–477.
- Perotti, R. and Kontopoulos, Y. (2002), Fragmented fiscal policy, *Journal of Public Economics* 86, 191–222.
- Persson, T. and Svensson, L. E. O. (1989), Why a stubborn conservative would run a deficit: Policy with time-inconsistent preferences, *Quarterly Journal of Economics* 104, 324–345.
- Poterba, J. M. (1994), State responses to fiscal crises: The effects of budgetary institutions and politics, *Journal of Political Economy* 102, 799–821.
- Poterba, J. M. and Rueben, K. S. (2001), Fiscal news, state budget rules, and tax-exempt bond yields, *Journal of Urban Economics* 50, 537–562.
- Schmitt- Grohé, S. and Uribe, M. (1997), Balanced-budget rules, distortionary taxes, and aggregate instability, *Journal of Political Economy* 105, 976–1000.
- Stix, H. (2013), Does the broad public want to consolidate public debt? The role of fairness and of policy credibility, *Kyklos* 66, 102–129.
- Thaler, R. H. and Shefrin, H. M. (1981), An economic theory of self-control, *Journal of Political Economy* 89, 392–406.

- von Hagen, J. and Wolff, G. B. (2006), What do deficits tell us about debt? Empirical evidence on creative accounting with fiscal rules in the EU, *Journal of Banking and Finance* 30, 3259–3279.
- White, H. (1980), A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica* 48, 817–838.