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ABSTRACT: We measure the contribution of fiscal decentralization to trust in government. Using repeated cross-country survey data of individuals on several measures of trust in government over the 1994-2007 period, we estimate an ordered response model of the government trust and fiscal decentralization nexus. We control for unobserved country characteristics, macroeconomic determinants, and individual characteristics. Our main finding is that fiscal decentralization increases trust in government. More specifically, a one percentage point increase in fiscal decentralization causes roughly a four-fifths of a percentage point increase in government trust. The beneficial effect of fiscal decentralization on trust in government is neither limited to nor necessarily large for relatively decentralized countries.

JEL Codes: D70, H11, H70, H72

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1 Introduction

During the last decades, many developed and developing countries have devolved parts of their fiscal policy-making authority to sub-national levels of government. This process of fiscal decentralization has been promoted by changes in the geopolitical landscape—such as the enlargement of the European Union and the breakup of the former Soviet Union—dissatisfaction with the role of the central government in policy setting, and the policy advice of the World Bank (Tanzi, 1995). Policy institutions like the World Bank emphasize the improvements in allocative efficiency resulting from more decentralized fiscal systems. The general notion is that sub-national governments are better at delivering public goods that match local preferences or providing a given level of public goods at lower cost or both (cf. Oates, 1972,1999).

Various empirical studies have measured the potential effects of fiscal decentralization on allocative efficiency. In particular, a lot of attention has been paid to the question whether fiscal decentralization can boost economic growth. So far, the empirical evidence on the growth-fiscal decentralization nexus is mixed.¹ The strong focus on the dynamics of allocative efficiency implies that other possible favorable effects of fiscal decentralization, such as lower corruption, a more effective provision of public goods, and improved governance, have received less attention.² More important, some political-economy aspects of fiscal decentralization, such as the effect on trust in government—defined as the ‘judgment of the citizenry that the system and the political incumbents are responsive, and will do what is right even in the absence of constant scrutiny’ (Miller and Listhaug, 1990, p. 358)—and political institutions, have not received any attention at all. This paper investigates whether fiscal decentralization promotes trust in government. To our knowledge, we are the first to analyze this relationship in a systematic way.

Why is it interesting to look at trust in government? From a political science perspective, trust in government is important for political leadership and governance. More specifically, a

¹Davoodi and Zou (1998) and Zhang and Zou (1998) find evidence of a negative relationship between fiscal decentralization and economic growth, whereas Thiessen (2003) and Iimi (2005) show that fiscal decentralization enhances economic growth. Others do not find a significant relationship (Woller and Phillips, 1998; Thornton, 2007).

²Exceptions are Treisman (2000) and Fisman and Gatti (2002), who study empirically the effect of fiscal decentralization on corruption, and Enikolopov and Zhuravskaya (2007), who study the effect on governance and public goods provision.

larger degree of trust in government makes it easier to commit resources that are needed for collective action or to obtain citizens' compliance with policy without coercion (Keele, 2007). Moreover, from an economic perspective, more trust in government may indirectly contribute to improved economic performance. Knack and Keefer (1997) show that a higher level of government trust is associated with a higher level of 'social capital,' which Putnam (2000, p. 19) defines as 'connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them.' A larger stock of social capital, in turn, induces a higher rate of economic growth.³ These governance and macroeconomic benefits make it particularly interesting to understand what factors contribute to trust in government.

Our paper is related to studies analyzing the determinants of trust defined more generally, which can be either trust in persons or institutions.⁴ Brehm and Rahn (1997), Alesina and La Ferrara (2002), Keele (2007), and Gustavsson and Jordahl (2008) study the determinants of trust using data for a single country. Except for Gustavsson and Jordahl (2008), who use Swedish data, all studies pertain to the United States. Knack and Keefer (1997) and Zak and Knack (2001) employ data for several countries to explain cross-country differences in trust. None of these studies, however, investigates the effect of fiscal decentralization on trust. Our paper is also somewhat related to papers studying aggregate determinants of individual outcomes.⁵ Of these studies, the one that comes closest to ours is that of Bjørnskov, Dreher, and Fischer (2008), who analyze the effect of fiscal decentralization on subjective well-being.

We use an ordered response model to analyze the effects of fiscal decentralization on several measures of trust in government defined in a broad sense (i.e., the government, civil services, parliament, and political parties). These measures of government trust—which are obtained from the *World Values Survey*—pertain to up to 35,259 individuals from 13 countries over the period 1994–2007. We take into account a wide array of determinants of trust at both the individual and aggregate level. Because we use data from multiple surveys over time for a given country (i.e., a repeated cross section, where the respondents differ by wave), we can control for country characteristics that are correlated with fiscal decentralization. On the methodological side, we thereby extend Mishler and Rose (2001) and Bjørnskov, Dreher, and

³Not only Knack and Keefer (1997), but also Rodrik (1999) and Zak and Knack (2001) find that economic growth rises with social capital.

⁴The definitions of trust in persons—also referred to as interpersonal trust—differ in the literature on trust, but generally refers to citizens' confidence in each other as members of a community.

⁵See the work of Mishler and Rose (2001), Di Tella, MacCulloch, and Oswald (2003), and Bjørnskov, Dreher, and Fischer (2008).

Fischer (2008), who do not control for this unobserved country heterogeneity.

Controlling for various macroeconomic determinants, individual determinants, and unobserved country characteristics, we find that fiscal decentralization increases trust in government. More specifically, a one percentage point increase in fiscal decentralization causes on average a four-fifths of a percentage point increase in government trust. The beneficial effect of fiscal decentralization on trust in government is neither limited to nor necessarily large for relatively decentralized countries; that is, the effect on government trust can be relatively small for countries with a highly decentralized fiscal system (e.g., Australia and Germany).

The remainder of this paper is organized as follows. Section 2 presents some theoretical considerations and discusses the data on government trust and fiscal decentralization. Section 3 sets out the methodology employed in estimating the effect of fiscal decentralization on trust in government. Section 4 presents the results, performs robustness checks, and addresses endogeneity concerns. Section 5 concludes the paper.

2 Government Trust and Fiscal Decentralization

This section sheds light on the relationship between fiscal decentralization and government trust. We first present some theoretical considerations. Subsequently, we provide a descriptive analysis of this relationship.

2.1 Theoretical Considerations

The formal literature on the non-economic benefits of fiscal decentralization is sparse. Theories describing the link between fiscal decentralization and government trust are absent. However, existing theories on the economic benefits of fiscal federalism are a good starting point in discussing the potential relationship between trust in government and fiscal decentralization. One of the basic arguments in favor of fiscal decentralization is provided by Tiebout (1956) and Oates (1972, 1999), who claim that fiscal decentralization improves allocative efficiency. They reason that sub-national governments have more information than national governments about local preferences, reflecting their proximity to households. Accordingly, sub-national governments are better at matching the provision of public goods to local preferences than national governments. We hypothesize that improved preference matching may not only

translate into higher efficiency but also into more trust in government.

The above line of reasoning can also be extended to several other arguments in support of fiscal decentralization such as Oates’s (1999) ‘laboratory federalism’ or the competition argument of Brennan and Buchanan (1980). Oates (1999, p. 1132) argues that ‘in a setting of imperfect information with learning-by-doing, there are potential gains from experimentation with a variety of policies for addressing social and economic problems’ and that the conditions to do so may be better when sub-national governments have fiscal policy-making authority. In other words, fiscal decentralization creates an environment that may foster more effective public policies. Brennan and Buchanan (1980) argue that fiscal decentralization increases jurisdictional competition, which constrains the total size of the public sector. Again, this may not only lead to more efficient public service delivery but also to higher government trust.⁶ Therefore, we propose the following hypothesis:

Hypothesis. *A larger degree of fiscal decentralization promotes trust in government.*

2.2 Data on Government Trust and Fiscal Decentralization

The measures of government trust are obtained from the *World Values Survey* of the World Values Survey Association (2009). Our data are taken from three waves of interviews of this survey, which cover up to 35,259 individuals over the period 1994–2007. More specifically, we use data from the 1994–1999, 1999–2004, and 2005–2007 wave. Given that we do not have countries in our sample with interviews in 1999, we use data over the period 1994–1998 for the 1994–1999 wave so that we have three non-overlapping time periods; that is, 1994–1998, 1999–2004, and 2005–2007. Because of data limitations implied by our choice of covariates, we consider two samples of 10 and 13 countries, respectively, that only partially overlap. The samples consist primarily of selected OECD members and some Eastern European and Latin American countries. We include only countries with at least two waves of surveys so that we can control for country-specific fixed effects (see Section 3.1). Table A1 in the Appendix shows the distribution of the interviews over the countries and waves for the two samples we consider.

To capture trust in government, we study several governmental institutions. This approach

⁶Fiscal decentralization may also give rise to costs. Shleifer and Vishny (1993) point to the possibility of soft budget constraints at the local level, causing excessive debt accumulation.

accommodates differences in the degree to which survey respondents may experience or have knowledge about these institutions. For instance, survey respondents may have a better grasp of the operations and performance of civil services rather than the government because they had direct dealings with civil servants in their town hall. In view of this approach, we employ four measures of government trust: (i) confidence in government; (ii) confidence in civil services; (iii) confidence in parliament; and (iv) confidence in political parties. All four measures are answers to the following question: ‘I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them?’ Survey respondents had to indicate their level of confidence on the following scale: ‘a great deal of confidence,’ ‘quite a lot of confidence,’ ‘not very much confidence,’ or ‘none at all.’ We follow Alesina and La Ferrara (2002) in defining confidence in organizations as trust in institutions. Moreover, since our selected organizations have in common that they all cover a dimension of government, we define confidence in those organizations as measures of trust in government. A somewhat similar approach is taken by Knack and Keefer (1997), who define confidence in government in a broad sense by taking an average of confidence in education, the legal system, the police, and the civil service rather than looking at these institutions individually. Mishler and Rose (2001) define political trust by taking the average of trust in parliament, the prime minister or president, courts, police, political parties, and the military.⁷ Compared to these studies, we employ more narrowly defined concepts of government and do not average over government-related institutions. Indeed, Table 1 shows that our different measures of government trust are not very strongly correlated; the correlation coefficients range from 0.45 to 0.68 and are significant at the 1 percent level.

Table 1 approximately here.

In line with most of the fiscal federalism literature, we measure fiscal decentralization as the share of sub-national government expenditures in general government expenditures. The data are taken from the 2010 edition of the IMF’s *Government Finance Statistics* (GFS). Based on the IMF’s *GFS Manual* (2001), sub-national expenditures are defined as expenditures on both the state and local government level, where the state level refers to the largest geopolitical entity within a country and the local level describes the smallest

⁷Brehm and Rahn (1997) and Alesina and La Ferrara (2002) investigate confidence in the executive branch of the federal government.

governmental units.⁸ General government expenditures encompass public expenditures on the central, state, and local government level.⁹ This measure of fiscal decentralization has been criticized by Martinez-Vazquez and McNab (2003) and Thornton (2007) for not accurately representing the degree to which sub-national governments have policy autonomy. The OECD (1999) has developed an alternative measure of fiscal decentralization, which takes into account various categories of tax autonomy of sub-national governments. However, the OECD indicator is not available for the samples we are considering and, therefore, we resort to the standard indicator used in the literature. We average the fiscal decentralization data over the years corresponding to the three specified time periods since fiscal decentralization data are not always available for the years in which the interviews took place. Average decentralization ratios during 1994–2007 vary between 0.13 for Chile and 0.59 for Canada.

Figure 1 displays the unconditional relationships between the four measures of government trust and fiscal decentralization. To facilitate a graphical presentation, we use an aggregate measure of government trust, the so-called confidence share, which is defined as the percentage of survey respondents of a country in a given wave that indicated to have either ‘a great deal of confidence’ or ‘quite a lot of confidence’ (cf. Knack and Keefer, 1997). Panels (a)–(d) of Figure 1 show that the confidence share is increasing in the degree of fiscal decentralization, although it rises to a different extent for each measure. For instance, the unconditional relationship is much stronger for confidence in civil services than for confidence in government.

Figure 1 approximately here.

3 Empirical Methodology

This section sets out an ordered response model for government trust, presents both individual-level and aggregate-level determinants, and discusses econometric issues.

⁸Some countries (e.g., the United States and Spain) have more than one level of government between the central level and the local level. In such cases, the *GFS Manual* groups the intermediate levels of government together with the level they are most closely associated with.

⁹Some studies use the share of sub-national revenue in general government revenues as an alternative measure (i.e., Enikolopov and Zhuravskaya, 2007). Typically, the revenue-based and expenditure-based decentralization measures are highly correlated. We therefore do not pursue the revenue-based measures further.

3.1 The Ordered Response Model

Our dependent variable in the analysis is a measure of government trust described in Section 2. Because the dependent variable is categorical and ordered, we use an ordered response model. To capture the repeated cross-sectional nature of our data—where households are different in each cross-section—we index individuals by $i(t)$, where $i(t) = 1, \dots, I$ and $t = 1, \dots, T$. More specifically, we estimate the following ordered logit model for individual $i(t)$ residing in country $j = 1, \dots, J$ at time t :

$$y_{i(t)jt} = k \quad \text{if} \quad \mu_{k-1} < y_{i(t)jt}^* \leq \mu_k \quad \text{for} \quad k = 1, \dots, K, \quad (1)$$

where k represents an index for the number of categories (where $K = 4$), μ_k is the upper cut-point for category k , and $y_{i(t)jt}^*$ is a latent dependent variable given by¹⁰

$$y_{i(t)jt}^* = \beta' \vec{x}_{jt} + \gamma' \vec{z}_{i(t)jt} + \eta_j + \phi_t + \varepsilon_{i(t)jt}, \quad (2)$$

where \vec{x}_{jt} is a matrix of variables at the aggregate level (Section 3.2.1), including our measure of fiscal decentralization, $\vec{z}_{i(t)jt}$ is a matrix of variables at the individual level (Section 3.2.2), and β and γ are vectors of parameters. The parameters η_j and ϕ_t are country-specific fixed effects and wave fixed effects, respectively, and $\varepsilon_{i(t)jt}$ is a logistically distributed error term with mean zero and variance $\pi^2/3$. We include country dummies to control for unobserved country-specific fixed effects such as culture and legal origin. Wave dummies are employed to control for shocks common to all countries. Because the analysis includes covariates defined at the aggregate level while our dependent variable is measured at the individual level, the regression disturbances may be correlated. To ensure the disturbances are robust to dependency across individuals, we cluster the standard errors at the country-wave level (cf. Moulton, 1990).

The probability of individual $i(t)$ of country j choosing category k conditional on \vec{x}_{jt} and

¹⁰The category $y_{i(t)jt} = 4$ corresponds to the answer ‘a great deal of confidence,’ $y_{i(t)jt} = 3$ to ‘quite a lot of confidence,’ $y_{i(t)jt} = 2$ to ‘not very much confidence,’ and $y_{i(t)jt} = 1$ to ‘none at all.’ The categories $k = 1$ and $k = K = 4$ (i.e., the extreme categories) are open-ended intervals with $\mu_0 \rightarrow -\infty$ and $\mu_K \rightarrow \infty$. See Long (1997) for further details on the ordered logit model.

$\vec{z}_{i(t)jt}$ is given by

$$\begin{aligned} \text{Prob}(y_{i(t)jt} = k | \vec{x}_{jt}, \vec{z}_{i(t)jt}) &= F(\mu_k - \beta' \vec{x}_{jt} - \gamma' \vec{z}_{i(t)jt} - \eta_j - \phi_t) \\ &- F(\mu_{k-1} - \beta' \vec{x}_{jt} - \gamma' \vec{z}_{i(t)jt} - \eta_j - \phi_t), \end{aligned}$$

where $F(\cdot)$ denotes the logistic cumulative density function of $\varepsilon_{i(t)jt}$. The corresponding log-likelihood function is given by

$$\ln L(\theta | \vec{x}, \vec{z}) = \sum_{i=1}^I \sum_{j=1}^J \sum_{k=1}^K \sum_{y_{i(t)jt}=k} y_{i(t)jt} \ln \text{Prob}(y_{i(t)jt} = k | \theta, \vec{x}, \vec{z}), \quad (3)$$

where $\theta \equiv [\beta \ \gamma \ \eta_j \ \phi_t \ \mu]'$ is a row vector with parameters, and μ is the vector of cut-points. For identification purposes, we set the constant to zero. Maximizing (3) gives the estimates of the coefficient vectors β and γ , the fixed effects η_j and ϕ_t , and the cut-points μ_k .

3.2 Determinants of Government Trust

We now discuss the determinants of government trust at both the aggregate and individual level. Table A2 in the Appendix presents descriptive statistics. We draw on the literatures on trust in persons and institutions in determining the expected sign of the determinants. Since there are only a few papers that deal with the determinants of trust in institutions, we also look at papers dealing with the determinants of trust in persons. Although Alesina and La Ferrara (2002) find that these two forms of trust are not necessarily correlated, there is ample evidence that trust in persons is affected in the same way as trust in institutions (cf. Brehm and Rahn, 1997; Mishler and Rose, 2001).

3.2.1 Determinants at the Aggregate Level

Besides our variable of interest, the matrix \vec{x}_{jt} contains controls at the aggregate level, which are measures of government quality, government size, income inequality, and both the level and volatility of the growth rate. The potential effects of time-invariant determinants at the aggregate level, such as ethnic fractionalization or the number of local governments, are picked up by the country dummies. Government quality is measured by the government effectiveness indicator, which is taken from the World Bank's *Worldwide Governance Indicators* (2008).

The government effectiveness indicator captures the quality of public services, the capacity of the civil service and its independence from political pressures, and the quality of policy formulation. The indicator generally ranges from -2.5 to 2.5, where positive values reflect a better institutional quality. The empirical analysis of Zak and Knack (2001) reveals a positive relationship between interpersonal trust and the quality of institutions related to contract enforcement and corruption. Mishler and Rose (2001) find that both interpersonal trust and trust in institutions decrease with corruption. Although these studies do not investigate government quality, our measure of government quality is highly correlated with measures of institutional quality related to corruption. Therefore, we expect a positive relationship between government quality and trust in government.

We also control for the size of government in estimating the effect of fiscal decentralization on government trust. Government size is measured by the share of general government final consumption expenditures in Gross Domestic Product (GDP), which is obtained from the World Bank's *World Development Indicators* (2010). To our knowledge, the relationship between government size and trust in institutions has not been analyzed directly. However, Brehm and Rahn (1997) find that trust in institutions increases with life satisfaction and Bjørnskov, Dreher, and Fischer (2008) show that life satisfaction decreases with government size. In view of this, we expect a negative relationship between government size and government trust.

Income inequality is included to control for the effect of the income distribution on government trust. We measure income inequality by the Gini coefficient, which is constructed using data taken from the *World Income Inequality Database* (2008) of the World Institute for Development Economics Research.¹¹ The analysis of Alesina and La Ferrara (2002) shows that the Gini coefficient is not related to trust in institutions. However, Knack and Keefer (1997), Brehm and Rahn (1997), Zak and Knack (2001), and Alesina and La Ferrara (2002) do find a negative effect of the Gini coefficient on interpersonal trust. The analysis of Gustavsson and Jordahl (2008) does not find support for this relationship, but presents evidence of a negative effect of other measures of income inequality. Hence, we expect a non-positive relationship

¹¹The database provides Gini coefficients based on different categories of income definition, type of income adjustment, area coverage, and data quality ratings. In addition, per category there are multiple measures per country per year. To construct one Gini coefficient per country per year, we applied the following preference ranking: consumption-based measures are preferred over income-based measures, national estimates are preferred over urban and rural estimates, and high-quality data are preferred over low-quality data.

between the Gini coefficient and government trust.

We include the level and the volatility of the growth rate of real GDP per capita to control for the effects of each country’s macroeconomic performance on government trust. We use the growth rate of real GDP per capita rather than its level given the possible stationary nature of the reported trust measures; see Di Tella, MacCulloch, and Oswald (2003). The growth rate is defined as the growth rate of GDP per capita at purchasing power parity (measured in 2005 international dollars). The volatility of the growth rate is measured by the standard deviation of the growth rate calculated based on the three specified time periods. Mishler and Rose (2001) find that trust in institutions increases with the GDP growth rate. However, Knack and Keefer (1997) and Zak and Knack (2001) do not find a relationship between the level of GDP per capita and trust, where Knack and Keefer (1997) look at trust in institutions and Zak and Knack (2001) at interpersonal trust. Therefore, we expect a non-negative relationship between the growth rate of real GDP per capita and government trust. The literature has not studied the effect of the volatility of the growth rate on trust yet. In view of the negatively sloped frontier between the growth rate and volatility of the growth rate (cf. Ramey and Ramey, 1995), the above relationship is likely to be negative.

3.2.2 Determinants at the Individual Level

The matrix $\vec{z}_{i(t)jt}$ contains a set of explanatory variables at the individual level—all are taken from the *World Values Survey*—which are measures of interpersonal trust, gender, age, education, income, social class, and the importance of politics in life. We are interested in estimating the effect of fiscal decentralization on government confidence above and beyond the effect of interpersonal trust. Interpersonal trust takes the value one if survey respondents indicated that ‘most people can be trusted’ and zero otherwise. Knack and Keefer (1997) find a positive relationship between interpersonal trust and trust in institutions using data at the aggregate level. Using data at the individual level, the analysis of Brehm and Rahn (1997) yields a similar result. Alesina and La Ferrara (2002) analyze the correlation between interpersonal trust and trust in several institutions employing data at the individual level. They find that interpersonal trust is positively related to trust for some government-related institutions, but these correlation coefficients are rather small.¹² Therefore, we expect a

¹²For example, interpersonal trust has the strongest relationship with confidence in the executive branch of the federal government but the corresponding correlation coefficient is only 0.06 (Alesina and La Ferrara 2002,

positive relationship between interpersonal trust and government trust.

Gender takes the value one if the survey respondent is male and zero otherwise. Age and education are both represented by three categories: for age these are 15–24, 25–34, and 35–44, and for education these are lower, middle, and upper. Income is represented by 10 categories, where category one corresponds to the lowest and 10 to the highest income level. Note that income levels denote the income deciles of the survey respondents' countries. Mishler and Rose (2001) find that both interpersonal trust and trust in institutions increase with age, but are not related to gender, education, or income. The studies by Alesina and La Ferrara (2002) and Gustavsson and Jordahl (2008) find that interpersonal trust increases with income and education. In contrast, Alesina and La Ferrara (2002) show that interpersonal trust is lower for women than for men and is increasing in age, while Gustavsson and Jordahl (2008) reveal that interpersonal trust is not related to gender or age. Hence, we expect that government trust is either not related to gender or higher for men and is non-negatively related to age, education, and income.

Social class is represented by five categories: upper, upper middle, lower middle, working, and lower class. The four categories representing the importance of politics in life are based on survey respondents' answers, which vary from 'not at all important' to 'very important.' To our knowledge, the literature does not provide a hypothesized sign for these covariates, but we expect them to have a positive effect on government trust.

Finally, as a robustness check, we include a dummy measuring whether an individual is unemployed to control for economic performance effects at the individual level. Brehm and Rahn (1997), Mishler and Rose (2001), and Gustavsson and Jordahl (2008) point out that interpersonal trust is lower for individuals that are unemployed. Mishler and Rose (2001) find the same relationship for trust in institutions rather than interpersonal trust. We expect government trust to be negatively related to individual unemployment.

3.3 Endogeneity

One concern is the potential endogeneity of fiscal decentralization. Citizens' trust in government may affect politician's reelection probabilities. Politicians in turn shape the political decision process on the appropriate degree of fiscal decentralization. In Tanzi's (1995) view,

p. 216).

however, the devolution of fiscal policy-making authority is unrelated to government trust. In view of these conflicting lines of reasoning, it is worthwhile to investigate the fiscal decentralization and government trust nexus further.

One could test for the potential endogeneity of fiscal decentralization by using an instrumental variables (IV) approach. However, in the context of an ordered logit model, this is not a straightforward procedure given that our left-hand side variable consists of four categories. Furthermore, traditional instruments for fiscal decentralization such as the origin of a country’s legal system (Fisman and Gatti, 2002) and country size (Enikolopov and Zhuravskaya, 2007) are time invariant and thus drop out in a fixed effects analysis. Therefore, we do not resort to an IV approach. Instead, we follow Di Tella, MacCulloch, and Oswald (2003)—who also study the effect of aggregate variables on outcomes at the individual level—by lagging our variable of interest by one time period to deal with the problem of endogeneity. More precisely, we lag fiscal decentralization by taking the average degree of fiscal decentralization of the three years preceding the wave in which the interviews took place. Since those data are not available for all countries, there is a reduction in sample size. To alleviate the loss of observations, we use the large sample rather than the small sample and look at both current and lagged fiscal decentralization. As a second approach, Di Tella, MacCulloch, and Oswald (2003) include the lags of all variables at the aggregate level and use the contemporaneous values of variables at the individual level that are truly exogenous (e.g., age and gender).

4 Estimation Results

Section 4.1 discusses the benchmark estimation results and Section 4.2 performs robustness checks.

4.1 Benchmark

4.1.1 Effects of Determinants at the Aggregate Level

Panel (a) of Table 2 presents the ordered logit estimation results for determinants at the aggregate level using the small sample of 22,794 individuals. In all regressions, we include wave dummies, country dummies, and the determinants at the individual level, except for the

employment status, as discussed in Section 3.2.2. Column (1) of Table 2 regresses confidence in government on fiscal decentralization. Columns (2), (3), and (4) add the quality and size of the government, income inequality, and macroeconomic performance, respectively. In all cases, fiscal decentralization enters with a positive and significant coefficient. Because of the nonlinear nature of the model, the estimated coefficients do not represent marginal effects. Section 4.1.3 discusses the interpretation of the size of the effect of fiscal decentralization on trust in government. In line with expectations, both government size and income inequality feature a negative and significant coefficient. The 2005–2007 wave coefficient is negative and significant, except for the case where we include all covariates at the aggregate level. The coefficients of government quality, the macroeconomic performance indicators, and the 1999–2004 wave are not significant.

Panel (a) of Table 2 approximately here.

In columns (5)–(8) of the table, we estimate the same set of specifications for confidence in civil services. The results are very similar to the previous results. Fiscal decentralization positively affects confidence in civil services and the effect is negative for both government size and income inequality. The coefficients of the macroeconomic performance indicators and the 1999–2004 wave are again not significant. In contrast to confidence in government, the coefficient of government quality is now positive and significant and the 2005–2007 wave coefficient is always negative and significant.

Columns (9)–(12) present estimation results for confidence in parliament. Fiscal decentralization has again a positive and significant effect. The coefficient of government quality is never significant. Government size enters with a negative coefficient, but is only significant at the 10 percent level for the case in which we include all covariates at the aggregate level. Coefficients of income inequality, the macroeconomic performance indicators, and the 1999–2004 and 2005–2007 waves are similar in sign and significance as the coefficients in the case of confidence in civil services.

Columns (13)–(16) show that in all cases fiscal decentralization increases confidence in political parties. The coefficients of government size, income inequality, and the 2005–2007 wave are always negative and significant. Government quality has a positive coefficient for the case in which we include all covariates at the aggregate level, but it is only significant

at the 10 percent level. The remaining coefficients differ from the corresponding coefficients of the other measures of government trust. More specifically, the 1999–2004 wave features a positive and significant coefficient, except for the case where we include all determinants at the aggregate level, and the macroeconomic performance indicators both show a negative and significant coefficient.

The overall picture suggests a positive and significant effect of fiscal decentralization on government trust.¹³ This relationship is robust to the inclusion of various control variables at the aggregate level. For those aggregate-level controls, the evidence is in line with the findings in the trust literature. Government quality is non-negatively related to government trust and both government size and income inequality negatively affect government trust. We do not find evidence of a systematic relationship between economic performance indicators at the aggregate level and government trust. Although not shown here, the individual country dummies are jointly significant and we cannot reject the hypothesis that they should not be included in any of the specifications; see Table A3 in the Appendix.

4.1.2 Effects of Determinants at the Individual Level

Panel (b) of Table 2 focuses on the determinants at the individual level. To conserve on space, we restrict our attention to the estimation results corresponding to columns (4), (8), (12), and (16) of Panel (a) of Table 2, where we include all determinants at the aggregate level. For all measures of government trust, interpersonal trust enters with a positive and significant coefficient. The coefficient of gender is only significant for confidence in civil services and confidence in political parties, where it is negative and the base category is female. Coefficients of the 15–24 and 25–34 age categories are negative and significant, coefficients of the lower and middle education levels are positive and significant, and the base categories are age 35–44 and higher education.¹⁴

The estimation results for income level categories differ across the measures of government trust, although all measures have in common that the coefficients of income levels 5 to 9 are not significant. Coefficients of income level categories are never significant for confidence in political parties. For the other measures of government trust, income level 1 has a negative and

¹³The qualitative results remain the same when we run a regression based on an average of the trust measures. In this case, we cannot say anything about the quantitative effects.

¹⁴Exceptions are the coefficients of middle education for confidence in civil services and age 15–24 for confidence in political parties, which are not significant.

significant coefficient. Coefficients of income levels 2 to 4 are only significant for confidence in government and are negative. In all cases, income level 10 is the base category. Social class categories always enter with a positive coefficient for all measures of government trust, where the base category is lower social class. However, these coefficients are never significant for the upper social class and always significant for the upper-middle social class. The significance of the coefficients of the other social class categories varies across the measures of government trust. The categories measuring the importance of politics in life always show up with a positive and significant coefficient for all measures of government trust, where the base category is that politics is not at all important in life.

Panel (b) of Table 2 approximately here.

In sum, the estimated coefficients of the determinants at the individual level are in line with the related literature, except for gender and education. Both interpersonal trust and income positively affect government trust, whereas gender and education have a negative effect on government trust, where a positive relationship is expected. The negative effect of education on government trust may be explained by the inclusion of social class as a control variable, which is positively related to government trust and positively associated with education.

4.1.3 Marginal Effects of Fiscal Decentralization

Because we use an ordered logit model, the sign of the estimated coefficients does not always correspond to the qualitative effect of fiscal decentralization on the reported confidence categories. More specifically, only the effects for the top and bottom categories are known; that is, a positive coefficient means that an increase in the fiscal decentralization ratio makes it more likely to have ‘a great deal of confidence’ and less likely to have ‘none at all.’ To determine the effects of fiscal decentralization on the intermediate categories of reported confidence, we calculate marginal effects, which are defined as the change in predicted probabilities of the categories of reported confidence for a one percentage point increase in the fiscal decentralization ratio.

Table 3 approximately here.

Table 3 presents marginal effects at the mean, which we calculate based on the estimation results corresponding to columns (4), (8), (12), and (16) of Table 2. All marginal effects are

significant and imply that a one percentage point increase in the degree of fiscal decentralization increases the confidence share on average by four-fifths of a percentage point. This effect is calculated by adding the marginal effects of the top two categories of confidence together for all measures of government trust and subsequently taking the average.

The point estimate is the largest for confidence in government. These findings are confirmed when using a regular logit analysis on the confidence share directly—where the dependent variable takes the value one if the respondent indicates to have either ‘a great deal of confidence’ or ‘quite a lot of confidence’ and zero otherwise—although the estimated effect is somewhat larger; see Table 3 and Table A4 in the Appendix.

Figure 2 approximately here.

In nonlinear models, average behavior of individuals differs from the behavior of the average individual, yielding a difference between average marginal effects and marginal effects at the mean. By taking the average of the predicted probabilities across individuals in the sample, we derive *average* marginal effects rather than marginal effects at the mean. Figure 2 reports how the average predicted probabilities vary with the decentralization ratio for the respective confidence categories. Average marginal effects across all four trust measures are positive for the top category ‘a great deal of confidence’ and are increasing in the degree of fiscal decentralization. The average marginal effects are also positive for the category ‘quite a lot of confidence.’ For the category ‘not very much,’ average marginal effects are positive at relatively small degrees of fiscal decentralization and turn negative when the fiscal system is rather decentralized. Moreover, the average marginal effects are a negative function of fiscal decentralization when they are positive and are a positive function of fiscal decentralization when they are negative. Average marginal effects are negative for the bottom category ‘none at all’ and are decreasing (in absolute terms) in fiscal decentralization.

To facilitate a comparison of the results across countries, we calculate the average marginal effect for each country. The results for an increase in the degree of fiscal decentralization by 5 percentage points are given in Figure 3, where the stacked bars are the changes in the average predicted probabilities for the respective confidence categories, which are represented by different shading patterns. The horizontal axis ranks countries in ascending order by either their confidence share or fiscal decentralization ratio.

Figure 3 approximately here.

The average marginal effects are the strongest for those countries with a large confidence share. When ranked by the degree of fiscal decentralization, we do not see a clear relationship. For example, Germany has a relatively high average fiscal decentralization ratio (39 percent) compared to Bulgaria (15 percent) or Georgia (20 percent), but has either a lower or the same average marginal effect on government trust. However, these results do not imply that the overall effect of fiscal decentralization on trust is not representative for a given country. Rather, they suggest that the beneficial effect of fiscal decentralization on trust in government is neither limited to nor necessarily large for relatively decentralized countries.

4.2 Robustness

As a first robustness check, we estimate an ordered probit model. The results are the same in sign and significance as those of the ordered logit model and are therefore not reported. To check for the robustness of our result to the choice of government trust measures, we take the average of the four measures of government trust as a new dependent variable. Although the qualitative results in this case remain the same, we cannot say anything about the quantitative effects.¹⁵ As a third robustness check, we control for additional economic performance indicators at the individual level by including the individual's unemployment status to the set of covariates (cf. Brehm and Rahn, 1997; Mishler and Rose, 2001; Gustavsson and Jordahl, 2008). At the same time, we broaden the country coverage in the sample from 10 to 13—and thus work with the large sample—at the expense of losing income inequality as a control variable at the aggregate level.¹⁶ Table 4 presents the estimation results. For all measures of government trust, the first column regresses reported confidence on fiscal decentralization and covariates at the individual level and the other columns subsequently control for the quality and size of the government, macroeconomic performance indicators, and individual unemployment. All estimations include country and wave dummies.

Table 4 approximately here.

¹⁵Averaging our government trust measures increases the number of confidence categories from four to 13. More precisely, the resulting average government trust measure takes the values 1, 1.25, 1.50, ..., 3.50, 3.75, and 4. These new confidence categories, however, have no meaning.

¹⁶The inclusion of unemployment at the individual level reduces the number of countries in the sample. To have at least as many countries as in our benchmark analysis, we drop inequality as a covariate.

The results in Table 4 are very similar to the benchmark outcomes. Fiscal decentralization always enters with a positive and significant coefficient, except in columns (3) and (4), where we analyze confidence in government. Although we do find a significant positive relationship between fiscal decentralization and confidence in government, the relationship disappears after controlling for the economic performance indicators at both the aggregate and individual level. The coefficients of government quality and government size are always positive and negative, respectively, but are only significant for confidence in civil services. These findings correspond to those of the benchmark outcome for government quality but deviate from the benchmark for government size. Thus, the negative relationship between government size and government trust is only robust for confidence in civil services. As in Panel (a) of Table 2, we cannot find evidence of a systematic relationship between economic performance and government trust, although some of the corresponding coefficients enter significantly. Moreover, the coefficient of individual unemployment is never significant.

To check the robustness of the average marginal effects without repeating the complete analysis, we calculate them for one measure of trust in government (i.e., confidence in civil services) using the estimation results for the large sample.¹⁷ We focus on civil services because it has the largest number of significant variables. Figure 4 shows results similar to those in the benchmark case (Table 3), which suggest that the size of the beneficial effect of fiscal decentralization on trust in government is not necessarily larger for more centralized countries. For example, Bulgaria and Chile have a relatively low average degree of fiscal decentralization compared to Australia and Germany, but have rather similar marginal effects. Finally, we find that, on average, the quantitative effect is smaller when looking at the point estimates. A one percentage point increase in fiscal decentralization now causes roughly a two-thirds of a percentage point increase in the confidence share.

Figure 4 approximately here.

Table 5 presents results where we control for the potential endogeneity of fiscal decentralization. The even numbered columns of Panel (a) regress the measures of government trust on the lag of fiscal decentralization and the same set of variables as in Table 4. The odd numbered columns—which employ the contemporaneous value of fiscal decentralization—

¹⁷The average marginal effects of the three other measures of trust in government and the marginal effects at the mean for all four measures are available upon request.

serve as a benchmark. All estimations include country dummies and wave dummies. Across all measures of government trust, fiscal decentralization shows a positive and significant coefficient. Except for government size, the other effects are similar to those of the benchmark analysis.

Table 5 approximately here.

Panel (b) of Table 5 reports the results of the other approach. The even numbered columns regress the respective measure of government trust on the lag of fiscal decentralization, the contemporaneous values of gender and age, and country and wave dummies. Subsequently, the off numbered columns add the lag of government size and the lag of the economic performance indicators. We exclude government quality from the analysis, since data from the *Worldwide Governance Indicators* are only available from 1996 onward. The results are similar to previous findings. Fiscal decentralization increases government trust once we control for covariates at the aggregate level. Government size enters with a significant and negative coefficient. We do not find a systematic relationship between economic performance and government trust.

5 Conclusions

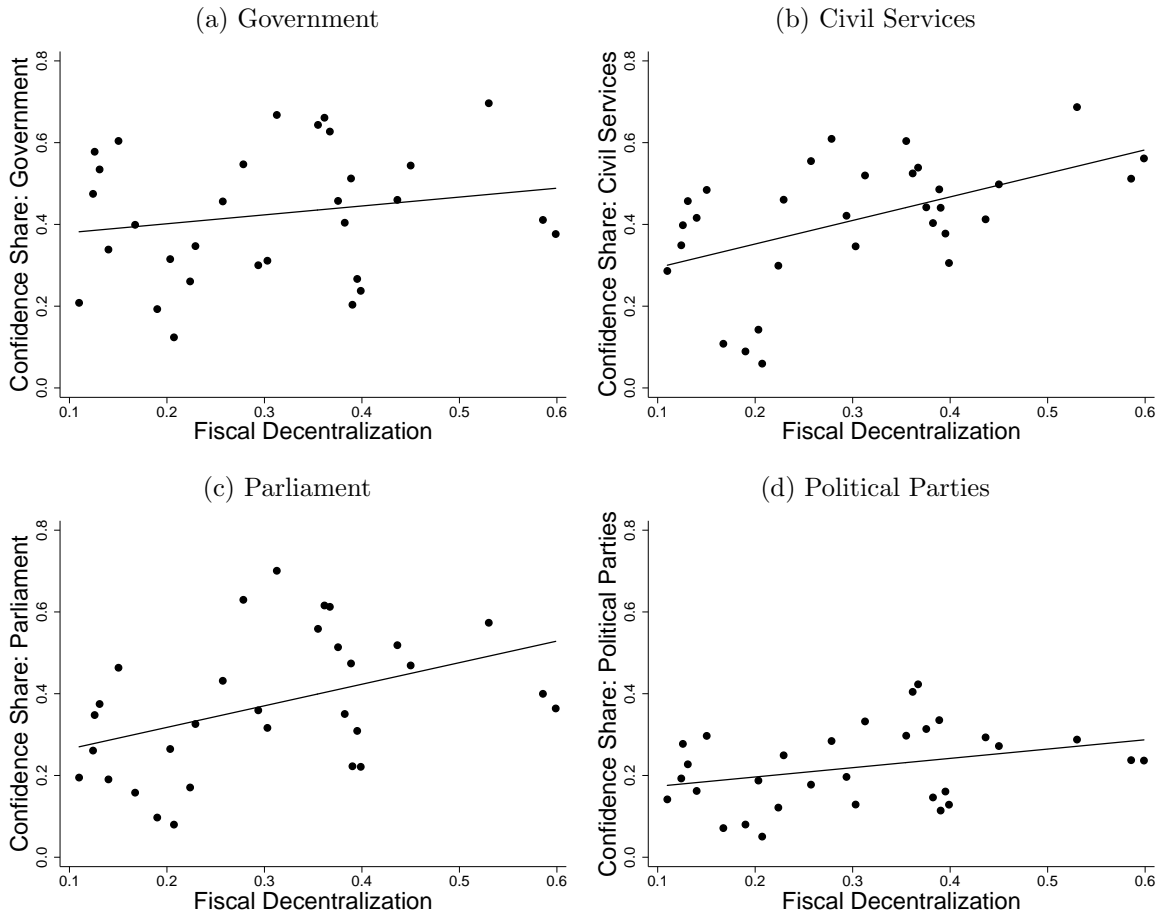
The paper analyzes whether fiscal decentralization enhances trust in government. To this end, we use survey data on several measures of government trust (i.e., government, civil services, parliament, and political parties) for up to 13 countries over the period 1994–2007. In addition to fiscal decentralization, we include macroeconomic determinants like government quality, government size, inequality, macroeconomic performance indicators, and individual characteristics as determinants of government trust. We also control for unobserved country heterogeneity and common shocks over time.

We find that fiscal decentralization increases government trust above and beyond interpersonal trust. More specifically, a one percentage point increase in the fiscal decentralization ratio causes roughly a four-fifths of a percentage point increase in government trust. The beneficial effect of fiscal decentralization on trust in government is neither limited to nor necessarily large for relatively decentralized countries. Our findings are robust to different sample sizes, changes in the set of control variables, and estimation techniques.

Our results are important from a policy point of view. Policy recommendations on fiscal decentralization have typically been based on the perceived improvements in allocative efficiency. Recognizing the non-negligible improvements in government trust would help policy makers in forming a more complete assessment of the pros and cons of fiscal decentralization. More important, trust in government contributes to the credibility and success of government policy more generally.

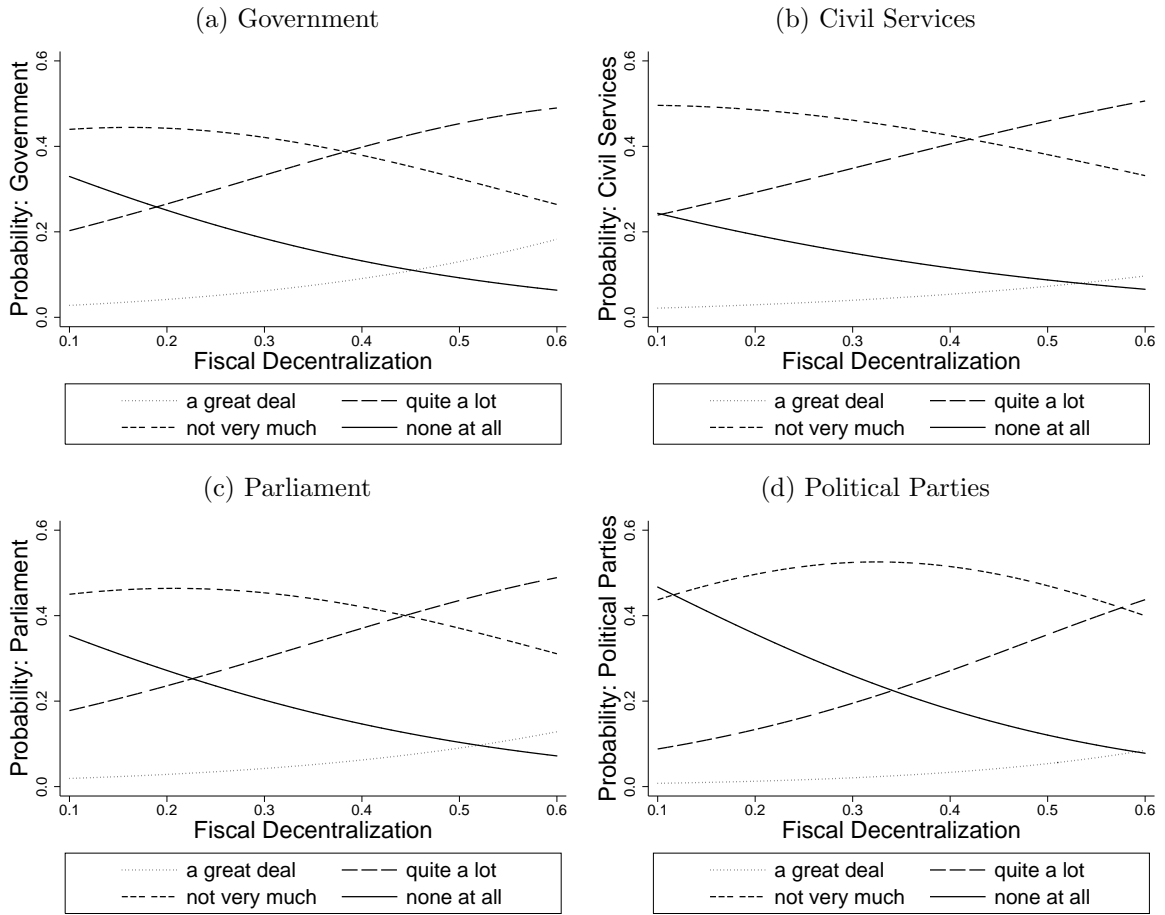
Future research could usefully focus on providing a theoretical underpinning of the transmission channels of fiscal decentralization on trust in government. Another avenue for further research is a more thorough treatment of the potential endogeneity of fiscal decentralization. To this end, we need to aggregate the confidence categories to just two and have to find valid instruments for fiscal decentralization. Because we control for country fixed effects—and thus exploit the within dimension of variation—suitable instruments have to be time varying. In this way, we can resort to a probit analysis with instrumental variables.

Figure 1: Confidence Shares and Fiscal Decentralization



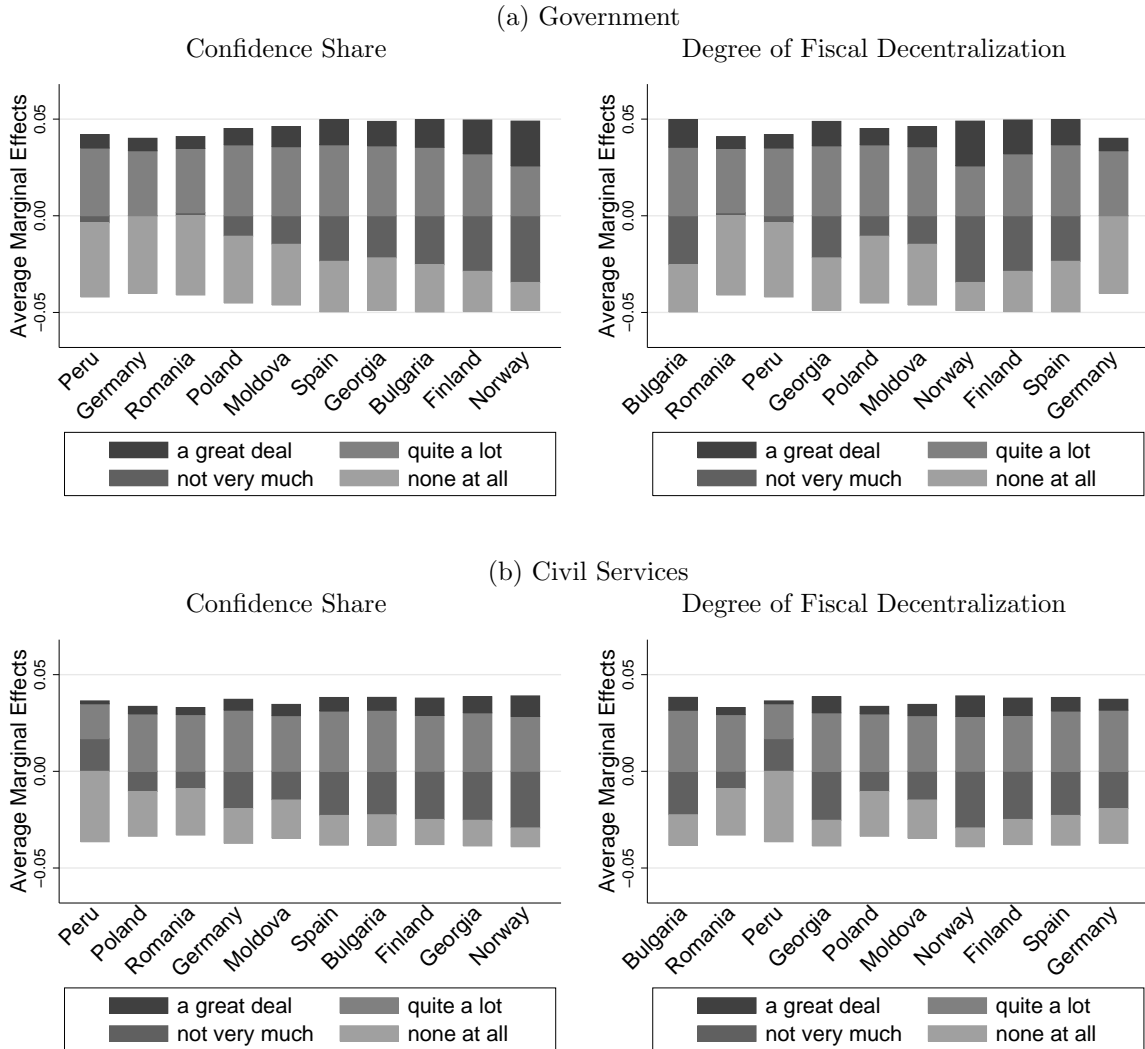
Notes: Based on the large sample of 13 countries and three time periods; see Table A1. The horizontal axis measures the degree of fiscal decentralization and the vertical axis represents the confidence share, which is defined as the percentage of survey respondents of a country in a given wave that indicated to have either ‘a great deal of confidence’ or ‘quite a lot of confidence.’

Figure 2: Average Predicted Probabilities and Fiscal Decentralization



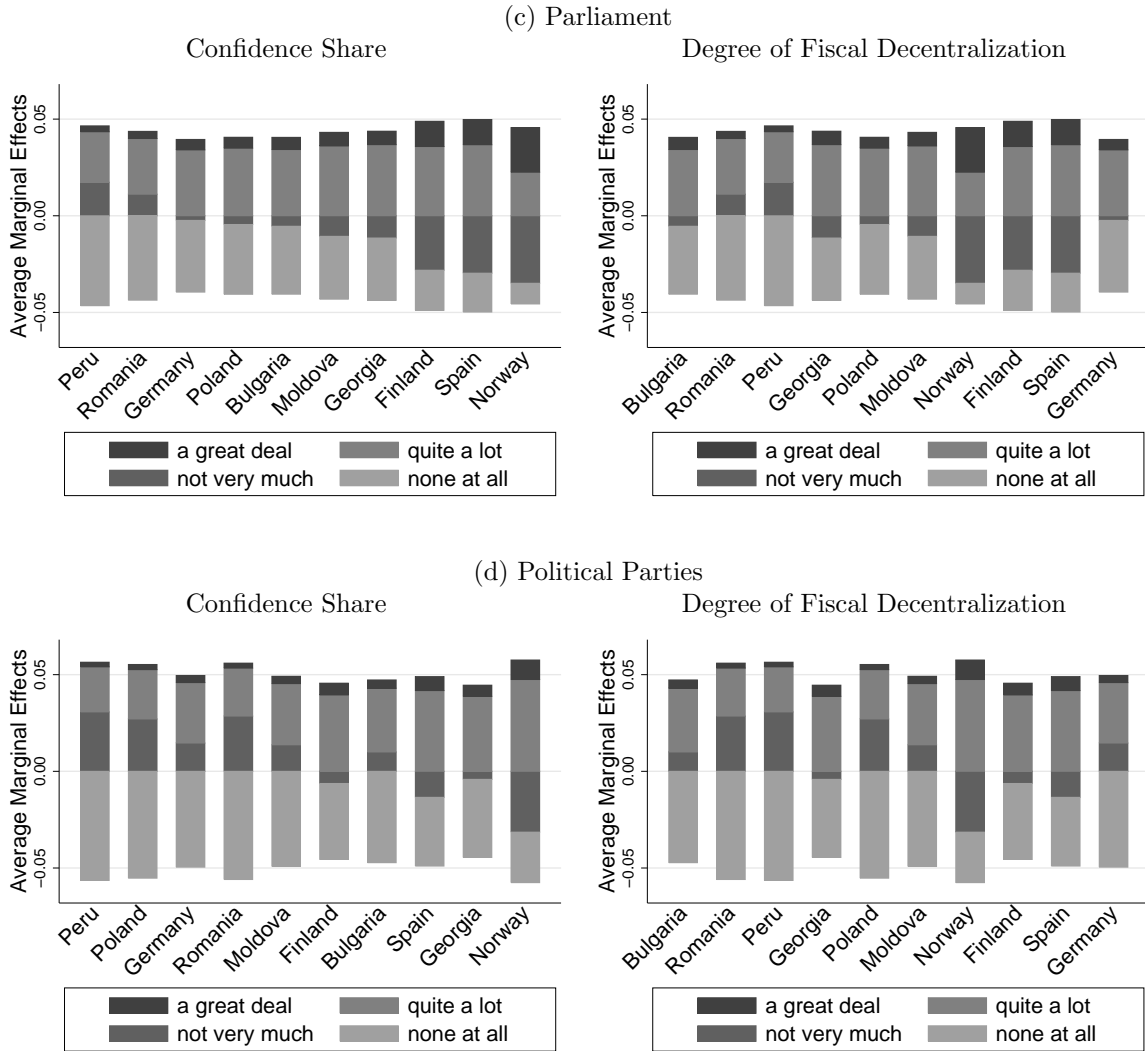
Notes: The vertical axis represents the average predicted probabilities of the respective confidence categories and the horizontal axis measures the degree of fiscal decentralization. Predicted probabilities are calculated on basis of the estimation results corresponding to columns (4), (8), (12), and (16) of Panel (a) of Table 2.

Figure 3: Average Marginal Effects of Fiscal Decentralization by Country



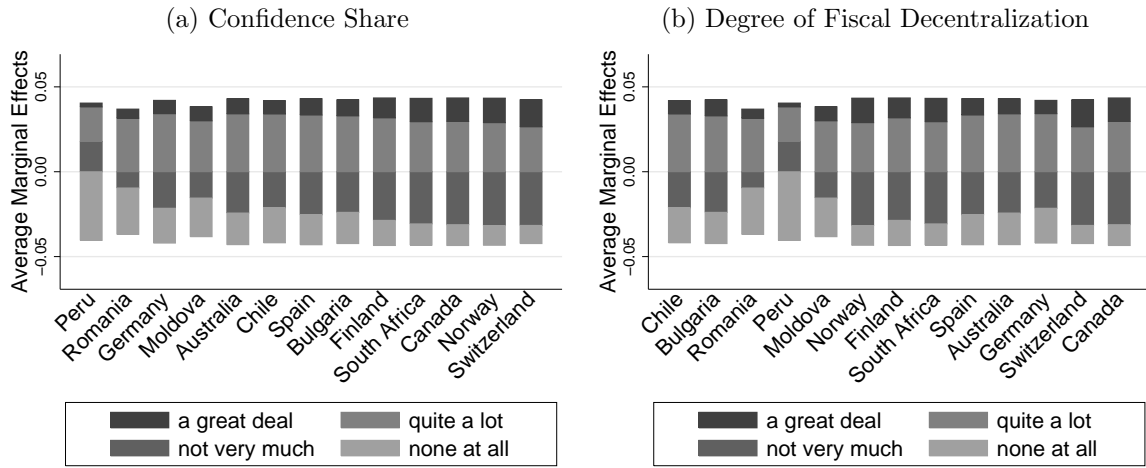
Notes: Countries are ranked in ascending order by either their confidence share or degree of fiscal decentralization. The confidence share is defined as the percentage of survey respondents of a country in a given wave that indicated to have either ‘a great deal of confidence’ or ‘quite a lot of confidence.’ Average marginal effects are changes in the predicted probabilities of the respective confidence categories for a 5 percentage points increase in fiscal decentralization. Average marginal effects are calculated on basis of the estimation results corresponding to columns (4), (8), (12), and (16) of Panel (a) of Table 2.

Figure 3: Average Marginal Effects of Fiscal Decentralization by Country (Continued)



Notes: Countries are ranked in ascending order by either their confidence share or degree of fiscal decentralization. The confidence share is defined as the percentage of survey respondents of a country in a given wave that indicated to have either ‘a great deal of confidence’ or ‘quite a lot of confidence.’ Average marginal effects are changes in the predicted probabilities of the respective confidence categories for a 5 percentage points increase in fiscal decentralization. Average marginal effects are calculated on basis of the estimation results corresponding to columns (4), (8), (12), and (16) of Panel (a) of Table 2.

Figure 4: Average Marginal Effects: Robustness on Civil Services



Notes: The table presents average marginal effect which are defined as changes in the average predicted probabilities of the respective confidence categories for a 5 percentage points increase in fiscal decentralization. Panel (a) ranks countries in ascending order by confidence share and Panel (b) by the degree of fiscal decentralization. Average marginal effects are calculated on basis of the estimation results corresponding to column (8) of Table 4.

Table 1: Correlation Coefficients of Government Trust Measures

	Civil Services	Parliament	Political Parties
Government	0.47***	0.68***	0.55***
Civil Services		0.55***	0.45***
Parliament			0.64***

Notes: Based on the large sample of 13 countries; see Table A1. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively.

Table 2: Government Trust and Fiscal Decentralization

	(a) Determinants at the Aggregate Level							
	Government				Civil Services			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal decentralization	4.618*** (1.40)	4.431*** (1.67)	5.373*** (1.40)	4.246** (1.93)	4.318** (2.02)	4.255** (2.06)	5.358*** (1.71)	3.236*** (1.11)
Government quality		0.508 (0.52)	0.714 (0.45)	0.620 (0.41)		0.743** (0.37)	0.996*** (0.29)	1.157*** (0.22)
Government size		-5.321* (3.06)	-6.769*** (2.57)	-5.747** (2.58)		-3.390 (3.26)	-5.155** (2.49)	-7.356*** (2.06)
Income inequality			-6.082*** (2.03)	-5.371** (2.43)			-7.249*** (1.18)	-5.532*** (0.94)
Level of growth rate				1.625 (6.32)				-7.105 (4.65)
Volatility of growth rate				0.052 (0.09)				-0.028 (0.06)
Wave 1999–2004	-0.187 (0.21)	-0.273 (0.22)	-0.246 (0.25)	-0.099 (0.24)	0.038 (0.15)	-0.052 (0.14)	-0.020 (0.16)	0.019 (0.25)
Wave 2005–2007	-0.427*** (0.12)	-0.367*** (0.13)	-0.416*** (0.12)	-0.268 (0.18)	-0.483*** (0.15)	-0.418*** (0.15)	-0.474*** (0.12)	-0.247*** (0.08)
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,794	22,794	22,794	22,794	22,794	22,794	22,794	22,794
McFadden's pseudo R^2	0.0438	0.0445	0.0466	0.0470	0.0587	0.0597	0.0627	0.0642

(Continued)

Table 2: Government Trust and Fiscal Decentralization

(a) Determinants at the Aggregate Level (Continued)

	Parliament						Political Parties			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)		
Fiscal decentralization	3.834** (1.51)	3.799** (1.49)	4.901*** (0.98)	4.176*** (1.29)	3.921*** (1.13)	3.774*** (0.90)	4.578*** (0.68)	5.042*** (0.63)		
Government quality		-0.119 (0.35)	0.124 (0.26)	0.213 (0.28)		-0.218 (0.23)	-0.038 (0.17)	0.223* (0.13)		
Government size		-0.547 (2.24)	-2.232 (1.43)	-3.392* (1.85)		-3.242** (1.62)	-4.514*** (1.10)	-7.665*** (0.86)		
Income inequality			-7.159*** (1.26)	-6.536*** (1.44)		-5.270*** (1.02)	-5.302*** (0.76)			
Level of growth rate				-3.455 (3.55)			-7.364*** (1.85)			
Volatility of growth rate				-0.022 (0.06)			-0.105*** (0.03)			
Wave 1999–2004	-0.099 (0.10)	-0.092 (0.11)	-0.062 (0.13)	-0.074 (0.16)	0.313*** (0.08)	0.308*** (0.07)	0.332*** (0.10)	0.116 (0.08)		
Wave 2005–2007	-0.403*** (0.08)	-0.407*** (0.10)	-0.466*** (0.08)	-0.393*** (0.14)	-0.269*** (0.07)	-0.265*** (0.07)	-0.306*** (0.04)	-0.399*** (0.05)		
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,794	22,794	22,794	22,794	22,794	22,794	22,794	22,794	22,794	22,794
McFadden's pseudo R^2	0.0657	0.0658	0.0687	0.0689	0.0532	0.0540	0.0556	0.0562		

Notes: The dependent variable is a measure of government trust, that is, confidence in government, civil services, parliament or political parties. All equations are estimated by ordered logit. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively. Standard errors are reported in parentheses below the coefficients and are clustered at the country-wave level. All regressions include covariates at the individual level [Panel (b) of Table 2] and country dummies (both are not reported).

Table 2: Government Trust and Fiscal Decentralization

(b) Determinants at the Individual Level

	Government (4)	Civil Services (8)	Parliament (12)	Political Parties (16)
Interpersonal trust	0.391*** (0.06)	0.338*** (0.05)	0.405*** (0.06)	0.302*** (0.05)
Male	-0.014 (0.03)	-0.066*** (0.02)	0.014 (0.03)	-0.051* (0.03)
Age 15–24	-0.290*** (0.06)	-0.171*** (0.05)	-0.187*** (0.06)	-0.059 (0.06)
Age 25–34	-0.194*** (0.04)	-0.144*** (0.03)	-0.166*** (0.04)	-0.095** (0.04)
Education is lower	0.336*** (0.08)	0.151* (0.08)	0.236*** (0.07)	0.267*** (0.07)
Education is middle	0.132** (0.06)	0.025 (0.05)	0.118** (0.05)	0.146*** (0.05)
Income level 1	-0.285** (0.12)	-0.171** (0.07)	-0.189* (0.11)	-0.060 (0.09)
Income level 2	-0.240* (0.13)	-0.071 (0.08)	-0.148 (0.13)	0.058 (0.09)
Income level 3	-0.233** (0.12)	-0.058 (0.07)	-0.137 (0.11)	-0.025 (0.10)
Income level 4	-0.183* (0.10)	-0.049 (0.08)	-0.119 (0.10)	0.022 (0.08)
Social class is upper	0.187 (0.17)	0.195 (0.17)	0.147 (0.14)	0.004 (0.19)
Social class is upper middle	0.409*** (0.12)	0.266*** (0.10)	0.362*** (0.12)	0.259** (0.11)
Social class is lower middle	0.272*** (0.09)	0.209*** (0.07)	0.201** (0.08)	0.125 (0.08)
Social class is working	0.166** (0.07)	0.128** (0.06)	0.079 (0.07)	0.055 (0.07)
Politics is very important	0.577*** (0.06)	0.453*** (0.05)	0.688*** (0.06)	1.154*** (0.09)
Politics is rather important	0.676*** (0.07)	0.479*** (0.05)	0.740*** (0.06)	1.021*** (0.06)
Politics is not very important	0.490*** (0.05)	0.346*** (0.04)	0.508*** (0.05)	0.665*** (0.05)
Aggregate covariates	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Observations	22,794	22,794	22,794	22,794
McFadden's pseudo R^2	0.0470	0.0642	0.0689	0.0562

Notes: The dependent variable is one of the four measures of government trust, that is, confidence in government, civil services, parliament or political parties. All equations include covariates at the aggregate level [Panel (a) of Table 2, columns (4), (8), (12), and (16), respectively]. The equations are estimated by ordered logit. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively. Standard errors are reported in parentheses below the coefficients and are clustered at the country-wave level. Base categories are female for gender, age 35–44, higher education, income level 10, social class is lower, and politics is not at all important in life. Coefficients of income levels 5 to 9 are never significant for any measure of government trust and are therefore not reported.

Table 4: Government Trust and Fiscal Decentralization: Robustness

	Government				Civil Services			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal decentralization	3.063** (1.51)	3.265* (1.89)	2.596 (1.65)	2.632 (1.65)	4.040** (1.92)	4.165** (1.90)	3.568*** (1.26)	3.584*** (1.26)
Government quality		0.657 (0.49)	0.606 (0.38)	0.601 (0.39)		0.875** (0.35)	0.943*** (0.25)	0.941*** (0.25)
Government size		-2.703 (5.94)	-9.370 (7.08)	-9.358 (7.06)		-1.533 (5.69)	-11.696** (5.03)	-11.698** (5.03)
Level of growth rate			2.331 (4.48)	2.349 (4.47)			-4.966** (2.50)	-4.961** (2.49)
Volatility of growth rate			0.120** (0.06)	0.120** (0.06)			0.037 (0.04)	0.037 (0.04)
Unemployment				0.119 (0.07)				0.043 (0.05)
Wave 1999–2004	-0.136 (0.16)	-0.177 (0.18)	-0.074 (0.15)	-0.079 (0.15)	-0.071 (0.11)	-0.105 (0.07)	-0.074 (0.09)	-0.076 (0.09)
Wave 2005–2007	-0.076 (0.13)	-0.063 (0.14)	0.136 (0.11)	0.133 (0.11)	-0.215* (0.12)	-0.183** (0.09)	-0.032 (0.10)	-0.033 (0.10)
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,259	35,259	35,259	35,259	35,259	35,259	35,259	35,259
McFadden's pseudo R^2	0.0554	0.0560	0.0579	0.0581	0.0499	0.0511	0.0532	0.0532

(Continued)

Table 4: Government Trust and Fiscal Decentralization: Robustness (Continued)

	Parliament					Political Parties				
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)		
Fiscal decentralization	3.422** (1.36)	3.427** (1.59)	2.978** (1.37)	3.018** (1.35)	2.798*** (1.03)	3.028** (1.18)	3.076** (1.20)	3.098*** (1.19)		
Government quality		0.095 (0.32)	0.101 (0.25)	0.097 (0.25)		0.040 (0.22)	0.143 (0.20)	0.141 (0.20)		
Government size		-0.055 (4.30)	-6.466 (5.45)	-6.450 (5.43)		-2.707 (3.39)	-6.175 (4.36)	-6.179 (4.35)		
Level of growth rate			-1.222 (3.24)	-1.194 (3.23)		-6.070** (2.40)		-6.062** (2.39)		
Volatility of growth rate			0.057 (0.04)	0.058 (0.04)		-0.063** (0.03)		-0.063** (0.03)		
Unemployment				0.127 (0.09)				0.060 (0.06)		
Wave 1999–2004	-0.175 (0.11)	-0.178 (0.12)	-0.129 (0.13)	-0.135 (0.13)	0.103 (0.10)	0.077 (0.12)	0.022 (0.10)	0.019 (0.10)		
Wave 2005–2007	-0.168* (0.09)	-0.164 (0.11)	-0.035 (0.10)	-0.038 (0.10)	-0.091 (0.06)	-0.108 (0.07)	-0.139* (0.08)	-0.141* (0.08)		
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Observations	35,259	35,259	35,259	35,259	35,259	35,259	35,259	35,259		
McFadden's pseudo R^2	0.0741	0.0741	0.0752	0.0753	0.0683	0.0684	0.0688	0.0688		

Notes: The dependent variable is a measure of government trust, that is, confidence in government, civil services, parliament, or political parties. All equations are estimated by ordered logit. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively. Standard errors are reported in parentheses below the coefficients and are clustered at the country-wave level. All regressions include covariates at the individual level and country dummies (both are not reported).

Table 5: Government Trust and Fiscal Decentralization: Controlling for Endogeneity

	Government		Civil Services		Parliament		Political Parties	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal decentralization	6.294*** (0.85)	6.045*** (0.76)	3.278*** (1.04)	2.667*** (0.96)	4.992*** (1.02)	4.491*** (0.96)	4.302*** (0.97)	3.683*** (0.93)
Government quality	1.418*** (0.20)	1.507*** (0.22)	0.869*** (0.21)	0.875*** (0.23)	0.515* (0.27)	0.561* (0.29)	0.391 (0.25)	0.414 (0.27)
Government size	22.624*** (4.92)	18.067*** (5.72)	1.924 (4.42)	-0.095 (4.56)	14.630** (6.16)	11.251* (6.59)	12.905*** (4.62)	10.164** (4.90)
Level of growth rate	-2.165 (3.27)	-1.548 (2.94)	-8.014*** (2.45)	-7.503*** (2.52)	-4.065 (3.28)	-3.469 (3.12)	-9.078*** (2.35)	-8.488*** (2.28)
Volatility of growth rate	0.404*** (0.04)	0.384*** (0.05)	0.044 (0.04)	0.033 (0.04)	0.229*** (0.06)	0.213*** (0.06)	0.053 (0.05)	0.039 (0.05)
Unemployment	0.097 (0.09)	0.095 (0.09)	0.013 (0.06)	0.012 (0.06)	0.106 (0.11)	0.105 (0.11)	0.022 (0.07)	0.021 (0.07)
Wave 1999–2004	-0.127 (0.12)	0.014 (0.11)	-0.167* (0.10)	-0.085 (0.10)	-0.159 (0.12)	-0.043 (0.12)	-0.009 (0.09)	0.095 (0.09)
Wave 2005–2007	0.523*** (0.07)	0.533*** (0.08)	0.033 (0.10)	0.049 (0.11)	0.204** (0.10)	0.219** (0.10)	0.053 (0.08)	0.069 (0.09)
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged fiscal decentralization	No	Yes	No	Yes	No	Yes	No	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,842	30,842	30,842	30,842	30,842	30,842	30,842	30,842
McFadden's pseudo R^2	0.0651	0.0651	0.0554	0.0552	0.0801	0.0799	0.0707	0.0705

(Continued)

Table 5: Government Trust and Fiscal Decentralization: Controlling for Endogeneity (Continued)

(b) Approach II

	Government		Civil Services		Parliament		Political Parties	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Fiscal decentralization (lagged)	3.044* (1.76)	1.745 (1.77)	0.937 (1.04)	1.764** (0.76)	2.867 (1.77)	3.281** (1.54)	2.913** (1.30)	3.984*** (1.31)
Government size (lagged)		-34.144*** (8.66)		-16.636*** (3.09)		-17.341*** (6.30)		-6.730 (5.89)
Level of growth rate (lagged)		-6.341* (3.30)		4.340*** (1.60)		-1.673 (3.09)		2.278 (2.71)
Volatility of growth rate (lagged)		0.123** (0.06)		0.284*** (0.03)		0.170*** (0.04)		0.179*** (0.05)
Male	-0.001 (0.03)	-0.000 (0.03)	-0.050*** (0.02)	-0.051 (0.06)	0.050 (0.03)	-0.055 (0.07)	-0.004 (0.02)	-0.003 (0.02)
Age 15–24	-0.141* (0.08)	-0.131* (0.08)	-0.055 (0.06)	-0.115*** (0.03)	-0.057 (0.07)	-0.091** (0.05)	-0.056 (0.05)	-0.055 (0.05)
Age 25–34	-0.117** (0.05)	-0.108** (0.05)	-0.116*** (0.03)	0.037 (0.06)	-0.093** (0.05)	-0.006 (0.17)	-0.089** (0.04)	-0.089** (0.04)
Wave 1999–2004	-0.010 (0.22)	0.041 (0.20)	0.057 (0.11)	0.225*** (0.06)	-0.044 (0.16)	0.118 (0.11)	0.183 (0.15)	0.186 (0.14)
Wave 2005–2007	-0.012 (0.17)	0.165 (0.16)	-0.005 (0.11)	-0.048*** (0.02)	-0.090 (0.12)	0.050 (0.03)	-0.041 (0.09)	0.132 (0.10)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,842	30,842	30,842	30,842	30,842	30,842	30,842	30,842
McFadden's pseudo R^2	0.0410	0.0449	0.0449	0.0484	0.0543	0.0562	0.0331	0.0344

Notes: The dependent variable is a measure of government trust, that is, confidence in government, civil services, parliament or political parties. All equations are estimated by ordered logit. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively. Standard errors are reported in parentheses below the coefficients and are clustered at the country-wave level. All regressions include covariates at the individual level and country dummies (both are not reported). Lags of aggregate variables are based on the three years preceding the starting year of the waves, that is, the years 1991–1993, 1996–1998, and 2002–2004 for the 1994–1998, 1999–2004, and 2005–2007 wave, respectively. The reduction in sample size is caused by Moldova and the 1994–1998 wave of South Africa for which no lagged fiscal decentralization data are available. The even numbered columns of Panel (a) lag fiscal decentralization, whereas the odd numbered columns—as a comparison—use the contemporaneous value of fiscal decentralization. The even numbered columns of Panel (b) use lagged fiscal decentralization, age, and gender. The odd numbered columns of Panel (b) add lags of all variables at the aggregate level. Government quality is excluded as a covariate because data are only available from 1996 onward.

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APPENDIX

Table A1: Country Shares in the Small and Large Sample

Country	Decentralization Ratio	Small Sample			Large Sample			
		Time Period		Total	Time Period		Total	
		1994-1998	1999-2004	2005-2007	1994-1998	1999-2004	2005-2007	
Australia ^{a,b}	0.39				1,605	1,210	2,815	7.98
Bulgaria	0.15	576		709	576	709	1,285	3.64
Canada ^{a,b}	0.59					1,514	3,030	8.59
Chile	0.13				827	1,035	2,713	7.69
Finland ^a	0.33	768		861	768	861	1,629	4.62
Georgia	0.20	1,727		1,121				
Germany ^{a,b}	0.39	1,376		1,594	1,366	1,587	2,953	8.38
Moldova	0.23	811	758	933	811	933	2,502	7.1
Norway ^a	0.30	939		883	939	883	1,822	5.17
Peru	0.19	842	1,400	1,230	842	1,400	3,470	9.84
Poland ^a	0.21	772		711				
Romania	0.17	975		1,309	975	1,301	2,276	6.46
South Africa	0.37				1,915	2,504	6,554	18.59
Spain ^{a,b}	0.37	743	767	989	743	989	2,497	7.08
Switzerland ^{a,b}	0.49				761	952	1,713	4.86
Total		9,529	2,925	10,340	22,794	15,522	35,259	100.00

Notes: We use the small sample for the benchmark specification and the large sample for the robustness checks. Table 1 and Figure 1 are based on the large sample. Countries marked with the superscript *a* are OECD members during the sample period and those marked by the superscript *b* are federal countries. Since our sample does not contain countries where interviews took place in 1999, the first time period corresponds to the wave 1994-1999 of the *World Values Survey*. The decentralization ratio of a country is based on the sample average for the respective country.

Table A2: Descriptive Statistics of the Benchmark Sample

	Obs	Mean	St. Dev.	Min	Max	Source
Confidence in government	22,794	2.20	0.82	1	4	WVS
Confidence in civil services	22,794	2.23	0.77	1	4	WVS
Confidence in parliament	22,794	2.12	0.81	1	4	WVS
Confidence in political parties	22,794	1.90	0.73	1	4	WVS
Interpersonal trust	22,794	0.27	0.44	0	1	WVS
Male	22,794	0.49	0.50	0	1	WVS
Age 15-24	22,794	0.25	0.43	0	1	WVS
Age 25-34	22,794	0.40	0.49	0	1	WVS
Age 35-44	22,794	0.35	0.48	0	1	WVS
Education is lower	22,794	0.31	0.46	0	1	WVS
Education is middle	22,794	0.47	0.50	0	1	WVS
Education is upper	22,794	0.23	0.42	0	1	WVS
Income level 1	22,794	0.13	0.33	0	1	WVS
Income level 2	22,794	0.16	0.37	0	1	WVS
Income level 3	22,794	0.17	0.37	0	1	WVS
Income level 4	22,794	0.15	0.36	0	1	WVS
Income level 5	22,794	0.14	0.35	0	1	WVS
Income level 6	22,794	0.09	0.29	0	1	WVS
Income level 7	22,794	0.07	0.25	0	1	WVS
Income level 8	22,794	0.05	0.21	0	1	WVS
Income level 9	22,794	0.02	0.15	0	1	WVS
Income level 10	22,794	0.02	0.16	0	1	WVS
Social class is upper	22,794	0.01	0.11	0	1	WVS
Social class is upper middle	22,794	0.17	0.37	0	1	WVS
Social class is lower middle	22,794	0.39	0.49	0	1	WVS
Social class is working	22,794	0.34	0.47	0	1	WVS
Social class is lower	22,794	0.09	0.29	0	1	WVS
Politics is very important	22,794	0.10	0.30	0	1	WVS
Politics is rather important	22,794	0.27	0.45	0	1	WVS
Politics is not very important	22,794	0.39	0.49	0	1	WVS
Politics is not at all important	22,794	0.24	0.43	0	1	WVS
Fiscal decentralization	22,794	0.25	0.09	0.11	0.44	GFS
Government quality	22,794	0.58	1.08	-0.79	2.14	WGI
Government size	22,794	0.17	0.04	0.10	0.23	WDI
Income inequality	22,794	0.36	0.08	0.26	0.52	WIIDER
Level of growth rate	22,794	0.04	0.04	-0.09	0.11	WDI
Volatility of growth rate	22,794	2.85	3.62	0.10	15.84	WDI

Notes: Based on the small sample (which is our benchmark). Data sources are the *World Values Survey* (WVS), the IMF's *Government Finance Statistics* (GFS), the World Bank's *Worldwide Governance Indicators* (WGI), the World Bank's *World Development Indicators* (WDI), and Version 2.0c of the *World Income Inequality Database* (WIIDER) of the World Institute for Development Economics Research. Descriptive statistics of variables at the aggregate level are calculated on a country-wave basis. The variable volatility of the growth rate is multiplied by a factor 100.

Table A3: Government Trust and Fiscal Decentralization: Testing for Country Fixed Effects

	Government		Civil Services		Parliament		Political Parties	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal decentralization	-0.733 (0.92)	2.632 (1.65)	0.590 (0.71)	3.584*** (1.26)	0.175 (0.88)	3.018** (1.35)	0.346 (0.61)	3.098*** (1.19)
Government quality	0.133 (0.21)	0.601 (0.39)	0.256* (0.14)	0.941*** (0.25)	0.035 (0.17)	0.097 (0.25)	-0.054 (0.12)	0.141 (0.20)
Government size	2.516 (3.54)	-9.358 (7.06)	4.766* (2.75)	-11.698** (5.03)	7.370** (3.20)	-6.450 (5.43)	5.467** (2.29)	-6.179 (4.35)
Level of growth rate	-3.597 (6.02)	2.349 (4.47)	-2.857 (5.71)	-4.961** (2.49)	-5.853 (5.36)	-1.194 (3.23)	-5.947 (4.20)	-6.062** (2.39)
Volatility of growth rate	-0.011 (0.08)	0.120** (0.06)	0.042 (0.06)	0.037 (0.04)	-0.057 (0.07)	0.058 (0.04)	-0.087* (0.05)	-0.063** (0.03)
Unemployment	0.232** (0.11)	0.119 (0.07)	0.129* (0.07)	0.043 (0.05)	0.195* (0.11)	0.127 (0.09)	0.106 (0.07)	0.060 (0.06)
Wave 1999–2004	0.184 (0.32)	-0.079 (0.15)	0.123 (0.20)	-0.076 (0.09)	0.043 (0.27)	-0.135 (0.13)	0.200 (0.20)	0.019 (0.10)
Wave 2005–2007	0.095 (0.35)	0.133 (0.11)	0.053 (0.20)	-0.033 (0.10)	-0.067 (0.30)	-0.038 (0.10)	-0.081 (0.21)	-0.141* (0.08)
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	No	Yes	No	Yes	No	Yes	No	Yes
Observations	35,259	35,259	35,259	35,259	35,259	35,259	35,259	35,259
McFadden's pseudo R^2	0.0208	0.0581	0.0352	0.0532	0.0455	0.0753	0.0536	0.0688

Notes: The dependent variable is a measure of government trust, that is, confidence in government, civil services, parliament or political parties. All equations are estimated by ordered logit. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively. Standard errors are reported in parentheses below the coefficients and are clustered at the country-wave level. All regressions include covariates at the individual level (which are not reported). The results presented in columns (2), (4), (6), and (8) coincide with those in columns (4), (8), (12), and (16) of Table 4. Wald tests on the country dummies for columns (2), (4), (6), and (8) give χ^2 values of 394.91, 241.88, 332.49, and 446.56, respectively, where the critical value is 5.23.

Table A4: Government Trust and Fiscal Decentralization: Regular Logit Model

	Government				Civil Services			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal decentralization	5.874*** (1.56)	5.758*** (1.85)	6.555*** (1.38)	5.938*** (2.01)	4.486** (2.22)	4.330* (2.23)	5.326*** (1.81)	3.493*** (1.31)
Government quality		0.796 (0.54)	1.004** (0.44)	0.814* (0.45)		1.199*** (0.42)	1.438*** (0.30)	1.528*** (0.26)
Government size		-8.576** (3.34)	-10.242*** (2.58)	-8.268*** (2.80)		-7.004** (3.34)	-9.245*** (2.29)	-10.679*** (2.33)
Inequality			-7.558*** (2.04)	-7.345*** (2.65)		-8.197*** (1.06)		-6.230*** (0.94)
Level of growth rate				4.705 (7.17)				-7.868* (4.77)
Volatility of growth rate				0.074 (0.10)				-0.048 (0.06)
Wave 1999-2004	-0.342 (0.22)	-0.509** (0.21)	-0.495** (0.23)	-0.344 (0.27)	-0.021 (0.20)	-0.268 (0.19)	-0.285 (0.23)	-0.152 (0.30)
Wave 2005-2007	-0.463*** (0.14)	-0.365*** (0.14)	-0.432*** (0.12)	-0.332 (0.23)	-0.490*** (0.18)	-0.400** (0.17)	-0.447*** (0.13)	-0.275*** (0.09)
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,794	22,794	22,794	22,794	22,794	22,794	22,794	22,794
McFadden's pseudo R^2	0.0785	0.0811	0.0853	0.0857	0.0955	0.0989	0.1040	0.1050

(Continued)

Table A4: Government Trust and Fiscal Decentralization: Regular Logit Model (Continued)

	Parliament				Political Parties			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Fiscal decentralization	5.135*** (1.64)	5.017*** (1.73)	5.789*** (0.97)	5.259*** (1.34)	4.289*** (1.48)	3.711*** (1.04)	4.336*** (0.64)	4.626*** (0.96)
Government quality		0.121 (0.43)	0.291 (0.25)	0.209 (0.32)		-0.145 (0.30)	0.008 (0.14)	0.014 (0.21)
Government size		-4.378 (2.85)	-6.184*** (1.40)	-5.400*** (2.02)		-7.928*** (2.09)	-9.289*** (1.21)	-9.273*** (1.67)
Inequality			-9.070*** (1.30)	-8.801*** (1.69)			-6.369*** (1.05)	-6.681*** (1.31)
Level of growth rate				1.834 (4.80)				0.724 (4.33)
Volatility of growth rate				0.036 (0.07)				0.000 (0.06)
Wave 1999–2004	-0.244** (0.12)	-0.321** (0.15)	-0.318*** (0.12)	-0.240 (0.19)	0.178 (0.11)	0.096 (0.09)	0.085 (0.09)	0.057 (0.14)
Wave 2005–2007	-0.444*** (0.11)	-0.410*** (0.12)	-0.490*** (0.08)	-0.418** (0.18)	-0.239* (0.13)	-0.167* (0.09)	-0.226*** (0.06)	-0.259** (0.13)
Individual covariates		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		22,794	22,794	22,794	22,794	22,794	22,794	22,794
McFadden's pseudo R^2		0.1160	0.1220	0.1220	0.0761	0.0797	0.0823	0.0824

Notes: The dependent variable takes on a value of one if the individual indicates to have either 'a great deal of confidence' or 'quite a lot of confidence' and zero otherwise. We consider all four measures of government trust, that is, confidence in government, civil services, parliament, and political parties. All equations are estimated by logit. ***, **, * denote significance at the 1, 5, and 10 percent level, respectively. Standard errors are reported in parentheses below the coefficients and are clustered at the country-wave level. All regressions include covariates at the individual level and country dummies (both are not reported).

2009

- 2009/1. Rork, J.C.; Wagner, G.A.: "Reciprocity and competition: is there a connection?"
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2010

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2011

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