



# Diversity and trust: The role of shared values



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## ABSTRACT

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Social diversity has been linked to a range of socio-economic and political outcomes, generally showing that higher diversity is associated with lower socio-economic performance. In this paper we focus on the extent to which key human values and beliefs are shared in society, which captures a dimension of diversity not previously discussed. We assess the importance of value diversity by focusing on its role in fostering generalized trust within societies. We find that value diversity, in particular with regard to political ideological values concerning income redistribution and the role of the government in influencing markets, is important for understanding the international variation in trust, with high diversity being associated with lower levels of trust. This relationship is robust to controlling for various other determinants of trust, including other dimensions of diversity, and holds at various levels of aggregation. *Journal of Comparative Economics* 44 (3) (2016) 522–540. University of South Carolina, Columbia, SC 29208, USA; University of Groningen, PO Box 800, 9700 AV, Groningen, Netherlands.

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## 1. Introduction

High diversity is associated with slow economic growth (Easterly and Levine, 1997; Glaeser et al., 1995), poor public goods provision (Alesina et al., 1999; Baldwin and Huber, 2010), low quality of institutions (La Porta et al., 1999), and a higher prevalence of civil wars (Besley and Reynal-Querol, 2014; Montalvo and Reynal-Querol, 2005). One important mechanism through which high diversity leads to such outcomes is the reduction of social cohesion. Most of the discussion on social cohesion revolves around trust, a reliable indicator of social cohesion (Freitag and Bühlmann, 2009; Stolle, 2002) and a concept widely recognized in the existing broader social sciences literature.<sup>1</sup>

Trust has been argued to be influenced by many different factors; for example, the presence of strong formal institutions (Axelrod, 1984; Alesina and La Ferrara, 2002). Most importantly, trust formation has been linked with social identity theory, suggesting that familiarity breeds trust (Coleman, 1990; Fukuyama, 1995; Putnam, 2000). There are strong cognitive and emotional bases for trust, and familiarity breeds trust precisely because it strengthens both these bases (Nooteboom, 2002). Familiarity may come from repeated interaction, which fosters a form of trust in a particular person or group of people. It may also come

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<sup>1</sup> Societies in which people trust one another have been shown to have better functioning institutions and democracies (Putnam et al., 1993; La Porta et al., 1997; Tabellini, 2008), are more efficiently organized (Bloom et al., 2012), are characterized by lower levels of corruption (Uslaner, 2008) and higher levels of financial development (Guiso et al., 2004), trade more (Guiso et al., 2009) and are overall economically more successful (Zak and Knack, 2001; Beugelsdijk et al., 2004; Algan and Cahuc, 2010; Tabellini, 2010).

from a perceived similarity and feelings of shared destiny among people. Thus, when diversity is low in a society and people feel close to their fellow citizens, they can identify with one another and are hence more likely to trust one another.

While trust has been related to diversity, researchers have so far captured diversity by measures of ethnolinguistic and religious fractionalization (Knack and Keefer, 1997; Glaeser et al., 2000; Alesina et al., 2003; Hooghe et al., 2009), segregation (Alesina and Zhuravskaya, 2011), and genetic diversity (Ashraf and Galor, 2013). Though insightful, none of the existing studies have explicitly considered the human values dimension of diversity—that is, the extent to which key values are shared in society. This is an important dimension of diversity, though, and conceptually interesting, as it can in principle cross ethnic- or genetic group lines. For example, value diversity may be present even among ethnically homogenous groups, while at the same time members of different ethnic groups may share key values. Also, value diversity is likely influenced by the frequency of social interactions between different groups and generally more malleable over shorter periods of time, while ethnic-linguistic or genetic diversity are by definition invariant to the former and arguably more persistent. In sum, the concept of value diversity captures subtle nuances of diversity that go beyond what is reflected in existing dimensions of diversity. It is a dimension of social diversity that is interesting and potentially important and that has so far not been studied in the trust literature.

Our paper fills this gap by providing data on value diversity that directly measure the extent to which members of the same society hold shared values. Our data not only capture whether there are different values present in society, but also how different, in terms of these values, members of a society are from one another. Our measure of diversity in human values is based on the polarization index proposed by Esteban and Ray (1994) and calculated from the individual responses to various values- and attitudes related questions in the World Values Survey (WVS) and the European Values Study (EVS). We are able to obtain value diversity scores for up to 100 countries and in up to five time periods. For 25 European countries, we can also calculate these scores at the sub-national level, covering 133 sub-national regions.

Using our newly assembled data on value diversity, we contribute to the literature by extending the analysis of diversity and its effect on cooperation and social cohesion, which is proxied for by the well-known indicator of generalized trust. We find that high diversity with regard to key human values is associated with lower levels of trust, and the association is particularly pronounced for values related to political values and ideologies. This relationship holds controlling for the average values held in a society. In other words, our main finding is that where political opinions are more diverse, even holding constant mean opinions, trust is lower.

More specifically, we find that societies in which people hold diverse views regarding government intervention in markets and the need to redistribute income, have lower levels of trust. This result is in line with key insights from social identity theory (Coleman, 1990; Tajfel, 1981, 2010). According to this literature, value differences trigger so-called fault lines between groups within society (Flache and Macy, 2011; Lau and Murnighan, 1998), defined as hypothetical dividing lines that split a society into clusters based on one or more attributes (Lau and Murnighan, 1998, 328). Social identification processes associated with such fault lines lead to low levels of generalized trust (Byrne, 1971; Bowles and Gintis, 2002). This is particularly the case for values concerning redistribution and the role of the state in the economy, because in an environment in which one part of society wants redistribution and the other part does not, the two groups may see the willingness to (not) share with the other as a violation of the social contract (Boix and Posner, 1998; Rothstein and Uslaner, 2005). This perceived violation of the social contract deepens the fault line between the groups, creating greater uncertainty regarding the behavioral predictability of the other group and reducing trust (Hardin, 1993; Misztal, 1995).

We show that the negative relationship between value diversity—particularly, as mentioned above, values related to economic policy issues—and trust is robust to the inclusion of an extensive set of control variables and holds at various levels of aggregation, namely the country-level, the subnational, and the individual level. At the country level, we find that the effect of value diversity is robust to controlling for other commonly used indicators of diversity. Furthermore, exploiting the panel nature of our data, we document that countries that experienced a large increase in value diversity between 1995 and 2005 at the same time also experienced a sharp decline in trust, showing that time-invariant country-specific factors are not driving our results. At the subnational (regional) level, we find that regions that are more diverse in terms of key values people hold have lower levels of trust, a result that holds after accounting for country fixed effects.

Based on social identity theory, we argue that the causal relation between value diversity and trust runs from diversity to trust. Yet, it could be argued that the relationship may be biased due to the presence of omitted variables or potential reverse causality.<sup>2</sup> Acknowledging the difficulty of proper identification strategies in the field of cultural economics, our analysis uses the average level of value diversity observed in the neighboring states of each country as an instrument for value diversity in our sample countries. We show that the relationship between trust and value diversity remains significant when value diversity is instrumented this way, suggesting that the link goes from diversity to trust and not vice versa. This conclusion is further supported by an analysis between trust and value diversity at the individual level. Specifically, we find that, controlling for country fixed effects and other region-level characteristics, individuals residing in diverse regions are less likely to trust other people than otherwise similar individuals residing in more homogenous regions.

In sum, our regression results indicate that there is a link between trust and value diversity (and in particular with values related to economic policy issues such as income redistribution and government intervention in markets) and the direction of causality runs primarily from diversity to trust and not the other way around. These findings suggest that public policy

<sup>2</sup> For example, it could be argued that in a low trust environment there are more people who believe that the government will not redistribute fairly, driving a wedge between potential beneficiaries and potential contributors. As a consequence, some people will be in favor of redistribution and government interventions in markets, while others will oppose it, resulting in polarization in opinions on those matters.

interventions directed toward integrating different ethnicities and fostering common values in society are of crucial importance for creating trust and promoting economic development in the long run.

The remainder of the paper is organized as follows. In section II we describe our measure of value diversity. Section III discusses the effect of value diversity on trust at the country-level. In section IV we present evidence from regressions based on subnational- and individual-level data. Section V concludes.

## 2. Construction of value diversity scores and data

### 2.1. Measuring value diversity

A proper measure of value diversity should reflect the degree to which key human values are shared in society or, conversely, the degree to which a society is polarized along such values. Such a measure should incorporate information on both the relative sizes of different groups in a society and the value differences between each pair of groups. In our study, we apply the polarization measure proposed by Esteban and Ray (1994), which was generalized further by Duclos et al. (2004). As Keefer and Knack (2002) argue, Esteban and Ray provide the most rigorous definition of polarization and their measure has many advantages over simpler ones that merely reflect inequality or fractionalization. Esteban and Ray's measure satisfies certain axioms that describe desirable features a polarization measure should satisfy, which are related to the Dalton axiom in the measurement of inequality.

In the context of measuring value differences within societies, Esteban and Ray's measure has one key advantage over the more commonly used fractionalization index, defined as one minus the Herfindahl index of group shares: it explicitly incorporates information about the difference or "distance" between groups on a given set of characteristics. Because our aim is to measure the extent to which key human values are shared in society, it is important that the measure we use not only reflects whether different groups in society hold different values but also how different these groups are from one another on these expressed values—in other words, their respective value distance.

Esteban and Ray's (1994) measure of polarization is formally expressed as follows:

$$P(\mu, p) = \sum_{i=1}^n \sum_{j=1}^n p_i^{1+\alpha} p_j |\mu_i - \mu_j|, \quad (1)$$

where  $\mu_i$  and  $p_i$ , respectively, denote the conditional mean of the attribute of interest in group  $i$  and the share of the population holding it (and correspondingly for group  $j$ );  $n$  denotes the number of different groups in the population; and  $\alpha \geq 0$  captures the degree of polarization sensitivity, or the extent of deviation from a more standard Gini-type inequality measure, which would result if  $\alpha$  was set to 0.<sup>3</sup> Esteban and Ray (1994) show that for the polarization measure to have certain desirable properties,  $\alpha$  must be nonnegative and should not exceed 1.6. In their follow-up study, Duclos et al. (2004), the authors specify a more narrow range for  $\alpha$  and argue that a sensible choice of  $\alpha$  should not exceed 1. Since conceptually there is no a priori reason to prefer one over the other, we choose the midpoint of the sensible range, 0.5, for our main specifications but also use the extreme values of 0 and 1. Our results are not sensitive to the choice of  $\alpha$ .

To define groups and quantify the value distance between them, we use various values- and attitudes-related survey questions. We define the different groups through the possible answers that can be given on a question and the distance between groups through the difference in the corresponding (ordinal) answer codes. Thus, for example, for a question of the form "To what extent do you agree with ... ?" with 10 available response categories (1 = "I don't agree at all," and 10 = "I fully agree"), we have 10 groups, the distance between which,  $|\mu_i - \mu_j|$ , is at most 9. The corresponding relative size of each group,  $p_i$ , is given by the share of the sampled population that chooses a given answer category. Using this information about the size of each group and its attribute  $\mu_i$  in Eq. (1), we derive a measure for the degree of value diversity or, more precisely, the degree of polarization on a specific human value associated with the particular survey question considered. The polarization index is 0 when all respondents give the same answer (perfectly homogeneous values), takes positive values otherwise, and reaches a maximum when a society has two equally sized groups with strongly opposing viewpoints.

### 2.2. Data

Ideally, we should use data on values that are generally acknowledged to capture the most important dimensions of human values. Developing such multidimensional value frameworks has been a cornerstone of cross-cultural psychological research. To this date, three such multi-dimensional frameworks exist (see Beugelsdijk and Maseland, 2011): (i) Hofstede (1980, 2001), (ii) Schwartz (1994, 2006) and (iii) GLOBE (House et al., 2004), of which Hofstede's framework is best known and most frequently used, specifically his dimension of individualism versus collectivism. For example, Hofstede's individualism-collectivism dimension has been used to show that countries that score higher on individualism experience faster long run growth (Gorodnichenko and Roland, 2011), and are more democratic (Gorodnichenko and Roland, 2015).

Unfortunately, none of the above frameworks can be used in our case, because our analysis requires individual-level data, which are not available in the Hofstede, Schwartz, and GLOBE databases. The World Values Survey (WVS) and European Values Study (EVS) databases are the only databases on values with individual-level observations for a large number of countries.

<sup>3</sup> If we let  $\alpha = 0$  and assume that all groups are equally different from one another ( $|\mu_i - \mu_j| = 1, \forall j \neq i$ ), we get the standard measure of fractionalization employed by, among others, Alesina et al. (2003).

**Table 1**

List of 17 questions with 10-point answer scales.

Question	Official code	Question text	Answer categories
1	A173	Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please indicate how much freedom of choice and control you feel you have over the way your life turns out.	1 = none at all, [...]  10 = a great deal
2	E033	In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking?	1 = left, [...]  10 = right
3	E035	Incomes should be made more equal versus we need larger income differences as incentives.	1 = more equal, [...]  10 = need larger income differences
4	E036	Private ownership of business should be increased versus Government ownership of business should be increased.	1 = government ownership, [...]  10 = private ownership
5	E037	People should take more responsibility to provide for themselves versus the government should take more responsibility to ensure that everyone is provided for.	1 = government, [...]  10 = people
6	E039	Competition is good. It stimulates people to work hard and develop new ideas versus competition is harmful. It brings out the worst in people.	1 = competition is harmful, [...]  10 = competition is good
7	F063	How important is God in your life?	1 = not at all important, [...] 10 = very important
8	F114	Justifiable: claiming government benefits to which you are not entitled	1 = never justifiable, [...] 10 = always justifiable
9	F115	Justifiable: avoiding a fare on public transport	1 = never justifiable, [...], 10 = always justifiable
10	F116	Justifiable: cheating on taxes if you have a chance	1 = never justifiable, [...], 10 = always justifiable
11	F117	Justifiable: someone accepting a bribe in the course of their duties	1 = never justifiable, [...], 10 = always justifiable
12	F118	Justifiable: homosexuality	1 = never justifiable, [...], 10 = always justifiable
13	F119	Justifiable: prostitution	1 = never justifiable, [...], 10 = always justifiable
14	F120	Justifiable: abortion	1 = never justifiable, [...], 10 = always justifiable
15	F121	Justifiable: divorce	1 = never justifiable, [...], 10 = always justifiable
16	F122	Justifiable: euthanasia (ending the life of the incurably sick)	1 = never justifiable, [...], 10 = always justifiable
17	F123	Justifiable: suicide	1 = never justifiable, [...], 10 = always justifiable

Source: World Values Survey, [www.worldvaluessurvey.org/](http://www.worldvaluessurvey.org/).

Although the WVS-EVS database is the result of a rich history of value surveys in sociology and political science, such as the General Social Survey and the Rokeach Values Survey, it does unfortunately not contain generally recognized value dimensions comparable to the ones provided by Hofstede, Schwartz, or GLOBE.

Given the necessity to employ individual-level data to calculate the degree of value diversity in society, we use the combined individual-level responses of the World Values Survey (WVS) and European Values Study (EVS).<sup>4</sup> Because of the nature of our diversity measure, we can only select survey questions that allow for sufficiently high variation in the possible responses and use ordinal response scales. A careful screening of the currently available waves of WVS and EVS shows that the majority of questions with ordinal response scales effectively allow for binominal answers or four answer categories only, making these questions problematic in the context of the present analysis due to their lack of meaningful between-group differences. Beyond those questions with two or four answer categories, the WVS and EVS questionnaires only include questions with 10 answer categories. We therefore focus our analysis on these questions with 10-point answer scales.<sup>5</sup> In total, the combined WVS and EVS data set contains 17 such 10-point answer scale questions, which we list in Table 1.<sup>6</sup> We have individual responses on these 17

<sup>4</sup> Combining WVS and EVS is possible because both surveys apply the same sampling strategy and use largely the same questionnaires. Most of the data downloadable from the WVS website already combine information from both WVS and EVS survey rounds.

<sup>5</sup> Although we prefer to use the 10 point scale questions, our results are robust to including the available 4-point answer scale questions as well. We did not include questions with binary responses as the concept of polarization is not applicable to such variables.

<sup>6</sup> To be precise, WVS and EVS include in total 21 questions with 10-point answer scales. However four of those were only asked in a very limited number of countries and thus had to be dropped from the analysis.

questions from approximately 350,000 individuals in 101 countries, with each country being sampled on average in three waves.<sup>7</sup> For European countries in 2008, we also have information on the region where the survey took place, resulting in observations for 133 regions in 25 countries.

Using the individual-level responses and the share of the sample population falling into each answer category, we calculate the degree of value polarization for all 17 questions based on Eq. (1). We then take averages across the 17 polarization scores for each country (or region) in each wave to generate an overall indicator of value diversity. This indicator captures how polarized in terms of their values societies are on average.

To test whether meaningful latent dimensions exist, we perform a factor analysis over the total matrix of 299 country–year polarization scores for the 17 questions. We found three factors that together explain 74% of the total variance in the data and are, by construction, orthogonal to one another. The Cronbach's alpha for the first, second and third sets of polarization scores are 0.95, 0.89 and 0.84, respectively, suggesting high internal reliability (see details available in the supplementary material, Appendix B).

The factor analysis indicates that the polarization scores on 16 of the 17 questions can be grouped along three dimensions; only question F121 cannot be clearly associated with any latent factor. The first dimension, which accounts for 34% of the total variance in the data, is formed by the first six variables, which all involve political values. Thus, the first factor can be interpreted as a dimension capturing polarization along political ideology. The second factor, which accounts for 23% of the total variance in the data, shows high loadings on questions 7, 12, 13, 14, 16 and 17, which involve matters of life and death and sexual relations. The third factor, which explains 17% of the total variance, shows high loadings on questions 8–11, relating to the legal–illegal aspects of human behavior as proscribed by law.

As mentioned before, WVS/EVS builds on a long tradition of value research. As a consequence, and not surprisingly, the three groups of values uncovered in our factor analysis have also strong theoretical roots. Political ideology is defined as the set of beliefs about the proper order of society and how this order can be achieved (Denzau and North, 1994). This dimension has a long history in political science (e.g. Lindqvist and Östling, 2010) and psychology (e.g. Jost et al., 2008; Jost et al., 2009), going back to Tomkins (1963). It is commonly measured by questions 1–6 in our list.<sup>8</sup>

The questions involving the justifiability of certain types of behavior and the importance of God (F163), in contrast, fit the so-called “morally debatable behavior” (MDB) scale, as originally developed by Crissman (1942) and updated by Harding and Phillips (1986). More recently, Katz et al. (1994) revised the scale, distinguishing now two dimensions. The first dimension relates to legal–illegal aspects of human behavior as proscribed by law. This dimension is commonly measured by questions 8–11. The second dimension of the MDB scale involves matters of life and death and sexual relations, all of which are measured by questions loading high on our second factor. Thus, our empirical finding that the overall indicator of value diversity consists of three dimensions (political ideology, legal–illegal aspects, and personal–sexual aspects of moral behavior) is in line with existing constructs discussed in the literature.

Polarization on the political ideology dimension is the average of the polarization scores for questions 1–6; on the personal–sexual behavioral dimension, the scores for questions 7, 12, 13, 14, 16 and 17; and on the legal–illegal behavioral dimension, the scores for questions 8–11. Thus, we have in total four measures of value diversity: one overall score and the three underlying dimensions. Each diversity measure can be calculated for each country in up to five periods, corresponding to the five available survey waves.

### 3. Value diversity and trust at the country level

We analyze the relationship between our indices of value diversity and a standard measure of generalized trust. To capture the level of trust in society, we use the responses to the WVS/EVS survey question “Generally speaking do you think that most people can be trusted or that you cannot be too careful?”. The respective country- (or region-level) score is the fraction of respondents answering, “Yes, most people can be trusted” in a given country or region. Previous research has shown that this measure is robust to the cultural context in which this question is asked, guaranteeing measurement equivalence across cultures (Freitag and Bauer, 2013).<sup>9</sup>

<sup>7</sup> Details on how the data were combined, a list of the countries in our database and their coverage across waves can be found in Appendix A of our supplementary material.

<sup>8</sup> Note that, strictly speaking, questions 1–6 in our dataset do not cover the whole range of the left–right political spectrum, but focus primarily, with the exception of question 2, on economic policy issues related to government intervention in markets and income redistribution. We nevertheless use, for simplicity, the term “political ideology” to refer to this set of values, acknowledging, though, that we primarily capture political opinions in the domain of economic policy.

<sup>9</sup> Both our dependent variable and our set of independent variables are taken from the same database. This common measurement variance may cause a common method bias under certain conditions (Podsakoff and Organ, 1986; Podsakoff et al., 2003). We have no reason to assume a bias because (i) we relate diversity in question responses to the level of trust, and a bias typically occurs when comparing levels of both the dependent and the independent variable; (ii) we use “different scale endpoints and formats for the predictor and criterion measures” (Podsakoff et al., 2003: 888), which limits the risk of such a bias; (iii) the model we estimate is complicated, and we have no reason to assume that individual respondents are cognitively able to relate national trust levels to the country level diversity scores.

**Table 2**  
Trust and value diversity.

	Dependent variable: Average Trust, 1981–2008							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Polarization (General)	-59.23***	-23.24*						
Mean values	[11.17]	[12.06]						
Polarization (Polit. Ideol.)			-55.77***	-32.21***				
Mean political ideology			[8.501]	[10.72]				
Polarization (Leg.–Illeg.)					-22.91	-11.9		
Mean score Leg.–Illeg.					[17.41]	[11.92]		
Polarization (Pers.–Sex.)							-15.43*	1.727
Mean score Pers.–Sex.							[9.064]	[7.313]
Gini		-0.17		-0.0507		-0.218*		-0.243**
GDP per capita		[0.123]		[0.126]		[0.115]		[0.118]
Population		0.000239**		0.000152		0.000282**		0.000282**
Monarchy		[0.000114]		[0.000112]		[0.000108]		[0.000120]
% Protestants		2.24e-05**		2.72e-05**		1.78e-05**		1.73e-05*
% Catholics		[8.95e-06]		[8.86e-06]		[8.79e-06]		[8.78e-06]
Adj R-squared	0.41	0.63	0.41	0.66	0.093	0.63	0.23	0.61
Obs.	75	75	77	77	77	77	77	77

Standard errors in brackets.

\*\*\*  $p < 0.01$ .\*\*  $p < 0.05$ .\*  $p < 0.1$ .

### 3.1. Baseline results

To maximize the sample size and reduce potential biases due to measurement error, our main analysis focuses on the across-wave average levels of trust and value diversity in each country. As a starting point, we run simple ordinary least squares (OLS) regressions of the form

$$T_c = \alpha + \beta D_c + \gamma V_c + \delta X_c + \varepsilon_c, \quad (2)$$

where  $c$  indexes countries,  $D$  stands for value diversity,  $V$  denotes the average values present in a society (as measured by the average response to the 17 questions or the three subsets) and  $X$  is a vector of additional covariates that may be correlated with trust (see below). Finally,  $\varepsilon$  is an error term.

Table 2 shows the first set of results. We first consider regressions in which the right-hand side variables include only our value diversity index and the average societal values (for both the overall construct and the three sub-dimensions). We do so in order to separate the effect of diversity in values from the effect of the values themselves. These results are presented in columns 1, 3, 5 and 7.<sup>10</sup>

Our overall indicator of value diversity enters the regressions negatively with a statistically significant coefficient, even when controlling for the effect of the values per se. We observe a similar pattern for the first dimension, political ideology. With regard to the remaining two dimensions, we find that there is no or only a weak relationship with trust.

Columns 2, 4, 6 and 8 add a set of regressors that are commonly included in the literature and considered to be important correlates of trust. The first covariate is income inequality, as measured by the Gini coefficient, taken from the UNU-Wider world income inequality database. We included this variable because social distance is partly reflected in income inequality, and this variable has been commonly included in trust regressions (Knack and Keefer, 1997; Zak and Knack, 2001; Uslaner, 2002). Second,

<sup>10</sup> Note that the sample size using the overall construct is smaller than that based on the three sub-dimensions. This is because there are two countries, Colombia and Egypt, for which not all 17 questions were answered in the same wave. Because we constructed our value diversity score by first creating a score for each country and wave and then averaging across waves, we could produce scores for the three sub-dimensions (coming from different waves), but not for the overall index for these two countries.

given the positive relationship between trust and economic development we alluded to in the introduction, we include the level of GDP per capita taken from Penn World Tables (PWT) Version 7.2. Third, because it has been argued that personalized trust is more likely to develop in smaller groups, we control for population size, also taken from PWT. Fourth, given Björnskov's (2006) finding that trust tends to be higher in monarchies, we add a dummy variable indicating if a country is a monarchy. Fifth, we control for the religious composition of the population by including the share of Protestants and Catholics in a country, since Catholicism has been associated with low trust (La Porta et al., 1997; Zak and Knack, 2001) whereas Protestantism has been associated with high trust (Glaeser et al., 2000; Zak and Knack, 2001; Uslaner, 2002; Björnskov, 2006). Data on the shares of Protestant and Catholics are taken from Barro and McCleary (2003). We average the control variables for each country over the period for which the corresponding trust and polarization scores are available. The only exceptions are the religious shares, which reflect averages over the period 1980–2000, because we do not have annual data for these variables.

The overall value diversity score and its political ideology dimension continue to be negatively and significantly related to trust after the inclusion of the control variables (columns 2 and 4), while the remaining two dimensions of value diversity are insignificant. Comparing the effect of overall value polarization with that of polarization along political values, we observe that the level of significance of the political ideology dimension is higher and its coefficient is less affected by the inclusion of the other regressors. This finding, together with the insignificance of the two remaining dimensions of value diversity, suggests that the negative effect of the overall value diversity index is driven by the political ideology dimension.

The insignificance of value polarization along the two “morally debatable” behavioral dimensions suggests that part of the variation in polarization along these dimensions captures variation in the average degree of tolerance of immoral or illegal behavior. Indeed, the correlation between diversity and average attitudes along the two MDB dimensions is very high, with correlation coefficients of 0.91 in the case of the illegal–legal dimensions and 0.84 in the case of the personal–sexual dimension.<sup>11</sup> This interpretation is particularly notable in column 7, which shows that a higher level of tolerance is associated with higher levels of trust. Thus, while columns 5–8 indicate that polarization in attitudes regarding the legal and personal–sexual dimensions of human behavior is not statistically significantly correlated with trust, this does not necessarily mean that diversity along these values is unrelated to trust. We are simply unable to identify the effect of polarization along these value dimensions due to the high correlation between diversity and the average level of tolerance of immoral behavior in society.

With regard to the magnitude of the estimated effects, we find that value diversity has one of the largest effects on trust among all the regressors considered. The point estimates of –23.24 for the overall polarization index (column 2), and the value of –32.21 for polarization on political values (column 4) imply that a one-standard-deviation increase in polarization will reduce trust by 0.22 (overall index) and 0.34 (political values) standard deviations, respectively, controlling for the effects of the other covariates. This difference in trust corresponds approximately to the difference in trust between Spain (low trust) and Great Britain (high trust). This effect size is only comparable to the effect of Protestantism, whose standardized coefficient is between 0.27 and 0.38 and which has been shown to be particularly important for explaining differences in trust (Björnskov, 2006). The effects of all the remaining regressors are lower.

The high correlation between the mean value score and the polarization score for the legal–illegal and personal–sexual behavioral dimensions make it impossible to interpret the regression results for these two dimensions. Moreover, we found insignificant results for these two dimensions of value polarization. In the remainder of our analysis we therefore focus on polarization in the context of political values.

### 3.2. Accounting for alternative dimensions of diversity

Value diversity may be correlated with other dimensions of diversity, which may also matter for trust. To account for this, we include as a first set of variables the ethnic, linguistic and religious fractionalization scores of Alesina et al. (2003), which have been shown to be correlated with various indicators of economic and institutional performance (Easterly and Levine, 1997; La Porta et al., 1999; Alesina et al., 2003). Second, we consider genetic diversity, measured by the probability that two randomly drawn individuals have different genetic characteristics, as predicted by migratory distance from Africa. The data are taken from Ashraf and Galor (2013), who show that genetic diversity within countries relates negatively to trust. Third, we consider the extent of ethnic and linguistic segregation, taken from Alesina and Zhuravskaya (2011), which the authors found to be negatively correlated with trust. Fourth, we include the ethno-linguistic diversity index proposed by Fearon (2003), which combines an index of ethnic fractionalization with information on the similarity between the different languages spoken in each country.

Table 3 presents the results of the analysis, which consist of four sets of regressions: one with ethnic, linguistic and religious fractionalization as additional regressors; one with genetic diversity; one set including the two indices of segregation; and one set using the ethno-linguistic diversity measure of Fearon (2003). In column (8) we include all the dimensions of diversity that

<sup>11</sup> A possible explanation for this correlation is that as societies modernize and become more secular, we see more tolerance of certain “immoral” behavioral acts, such as abortion, prostitution, and homosexuality, which are condemned in more traditional societies (Inglehart and Baker, 2000). Hence, if modernization and secularization bring about an increase in the representation of people of the “tolerant” type, without any elimination of the “intolerant” ones, an increase in overall tolerance comes hand in hand with an increase in diversity in opinions regarding these behavioral norms, creating a strong correlation between average values and diversity in these values. In the case of political opinions, on the other hand, it is more plausible to think that an increase in political polarization comes with an increase in the frequency of opinions on both ends of the left–right political spectrum. In other words, the increase in diversity in political values may be mean-preserving and hence unrelated to changes in average political opinions.

**Table 3**  
Trust and alternative dimensions of diversity.

	Dependent variable: average Trust, 1981–2008							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Polarization (Pol. ideology)	-31.80*** [10.50]	-35.57*** [10.36]	-38.10*** [11.13]	-28.13** [10.65]	-22.11* [13.27]	-25.96* [13.93]	-23.45** [11.43]	-32.41*** [10.64]
Mean political ideology	5.054* [2.868]	4.605* [2.756]	4.128 [2.824]	2.563 [2.847]	7.142** [3.145]	5.377 [3.247]	4.286 [2.856]	3.698 [2.843]
Fractionalization (Ethnic)	-8.723* [4.372]							
Fractionalization (Language)		-9.361** [3.538]						-7.601** [3.806]
Fractionalization (Religion)			-7.831* [4.601]					
Genetic diversity				-48.93** [23.39]				-30.31 [24.71]
Segregation (Ethnic)					-3.43 [8.676]			
Segregation (Language)						-5.126 [8.171]		
Ethno-linguistic diversity							-3.356 [4.850]	
Adj R-squared	0.67	0.69	0.67	0.68	0.74	0.75	0.68	0.69
Obs.	77	77	77	77	61	56	73	77

Note: All regressions displayed also control for the variables listed in Table 2. Standard errors in brackets.

\*\*\*  $p < 0.01$ .

\*\*  $p < 0.05$ .

\*  $p < 0.1$ .

individually have a significant effect on trust also simultaneously.<sup>12</sup> In addition to the variables displayed in Table 3, we also always control for the standard set of covariates listed in the bottom half of Table 2.

Our index of polarization on political values remains statistically significant after controlling for the other dimensions of diversity. Ethnic, language, and religious diversity, as well as, genetic diversity also show a significant relationship with trust. Similar to Table 2, on average, a one standard deviation increase in polarization in political values reduces trust by roughly 1/3 of a standard deviation.<sup>13</sup> The effect sizes of ethnic, language, religious, and genetic diversity are smaller, about one half of that of diversity in political values.

It can be argued that ethnic, linguistic, religious, and genetic diversity are important drivers behind the variation in political values observed across individuals within the same society. Yet, values polarization may in principle even occur within ethnically or genetically homogenous groups. Also the degree of values polarization may differ across societies with the same level of ethnic or genetic diversity, for example due to differential distances in values between ethnic groups. This suggests that value diversity likely picks up subtle nuances of social diversity that may be rooted in ethno-linguistic or genetic diversity, but are conceptually different. Hence, our findings are in line with the existing literature, such as Alesina et al. (2003) or Ashraf and Galor (2013): Social diversity is an important factor behind the international variation in trust. It is not only diversity along ethnic group lines or in the genetic make-up that matter, though, but also subtle nuances of diversity expressed through the key values people adhere to.

### 3.3. Robustness tests

Our first robustness test concerns the exact specification of the polarization function. According to Esteban and Ray (1994) and Duclos et al. (2004), a sensible choice for  $\alpha$  should fall in the range between 0 and 1, with 0 implying a measure comparable to the Gini coefficient. We therefore now allow  $\alpha$  to take these extreme values of 0 and 1. Furthermore, we assess how a diversity measure that ignores distances between groups would perform. We do so by calculating the value of polarization that would result in our case if we set  $\alpha$  to zero and ignore the variation in value differences between individuals ( $|\mu_i - \mu_j| = 1$ ), which, as explained earlier in footnote 3, would produce a measure of fractionalization in human values.

As shown in Table 4, polarization in political values remains negatively and statistically significantly correlated with trust when  $\alpha$  is set to 0. If we let  $\alpha$  take a value of 1, the relationship is still marginally significant, with a  $p$ -value of 0.12.<sup>14</sup> Interestingly, when employing the fractionalization measure (column 4) we find that value diversity is not significantly related

<sup>12</sup> Since ethnic, language, and religious fractionalization are correlated and to some degree based on the same underlying data, we cannot include them simultaneously. We hence focus within this set on language fractionalization, which among the three has the strongest relationship with trust.

<sup>13</sup> The effect size of values polarization in columns 5 and 6 is smaller, which is largely due to the smaller sample sizes.

<sup>14</sup> A higher value for  $\alpha$  makes the polarization measure more sensitive to changes in the distance between groups or relative group sizes. This increases the variation in measured polarization across countries. With a higher variation in polarization, naturally its power in explaining a given variation in trust declines.



**Table 4**  
Different specifications of the polarization function.

	Dependent variable: Average Trust, 1981–2008			
	(1)	(2)	(3)	(4)
Specification	Alpha = 0	Alpha = 0.5	Alpha = 1	Fractionalization
Polarization (political ideology)	-14.56*** [3.929]	-32.21*** [10.72]	-31.28 <sup>a</sup> [20.11]	-27.74 [23.13]
Mean political ideology	3.408 [2.751]	3.775 [2.856]	3.459 [3.021]	2.372 [2.973]
Gini	-0.086 [0.113]	-0.0507 [0.126]	-0.11 [0.141]	-0.269** [0.117]
GDP per capita	0.000129 [0.000109]	0.000152 [0.000112]	0.000256** [0.000109]	0.000269** [0.000109]
Population	1.95e-05** [7.97e-06]	2.72e-05*** [8.86e-06]	2.47e-05** [9.89e-06]	1.49e-05* [8.80e-06]
Monarchy	8.270*** [2.892]	8.608*** [2.975]	8.340** [3.154]	9.374*** [3.128]
% Protestants	-0.0446 [0.0303]	-0.0566* [0.0308]	-0.0661** [0.0320]	-0.0587* [0.0330]
% Catholics	0.183*** [0.0529]	0.177*** [0.0550]	0.192*** [0.0574]	0.216*** [0.0575]
Adj R-squared	0.68	0.66	0.63	0.62
Obs.	77	77	77	77

Standard errors in brackets.

\*\*\*  $p < 0.01$ .

\*\*  $p < 0.05$ .

\*  $p < 0.1$ .

<sup>a</sup>  $p = 0.12$ .

to trust. This indicates that the degree to which values differ in society (value distance) is important and plays a critical role in understanding the relationship between diversity and the international variation in social trust.

In our second robustness test, we include in addition to the basic covariates employed until now other regressors that have been either linked with trust or argued to influence the extent of value diversity in societies. Specifically, we include the following variables (averaged over the period for which the corresponding trust and polarization scores are available):

- (i) The quality of institutions, measured as the first principal component of the six governance indicators reported in the World Bank's "Worldwide Governance Indicators" (Kaufmann et al., 2009), because it has been shown that the quality of institutions is correlated with norms of trust (La Porta et al., 1997; Tabellini, 2010).
- (ii) The level of political rights reported by Freedom House.<sup>15</sup> This variable captures the degree of political and democratic freedom present in countries and reflects aspects such as the right to vote, compete for public office, join political parties, etc. This variable is included as the level of democracy may be correlated with both trust and the degree of social diversity (Bjørnskov, 2008).<sup>16</sup>
- (iii) The geographic location of countries, reflected in their degrees of absolute latitude, given the evidence documented by Michalopoulos (2012) that ethnic diversity is linked to geography.
- (iv) A dummy variable for sub-Saharan African countries, given that in these countries trust is particularly low and diversity particularly high (Michalopoulos, 2012; Ashraf and Galor, 2013).
- (v) A dummy variable for post-communist countries, given the evidence that the collapses of the former socialist regimes were accompanied by a sharp decline in trust (Paldam and Svendsen, 2001).
- (vi) The share of the population older than 65 years of age, given that older people tend to be more trusting than younger ones (Alesina and La Ferrara, 2002).
- (vii) The year of state formation, taken from Wimmer and Min (2006). This variable is included because the process of nation-state formation has been argued to be associated with a process of trust building (Flora, 1999): Similar to the unifying role of a monarch, a long history of stable state organization is associated with higher trust and stronger consensus on how society should be organized.
- (viii) A dummy variable indicating whether a country has been involved in a civil war since 1970, using the information provided by the Correlates of War project in their Intra-State War data set v4.0. We included this variable because civil wars have been documented to happen more frequently in ethnically diverse states (Montalvo and Reynal-Querol, 2005) and may also erode trust.

<sup>15</sup> [www.freedomhouse.org](http://www.freedomhouse.org)

<sup>16</sup> We have also experimented with using the level of democracy reported in the Polity IV dataset (Marshall et al., 2014)—the Polity2 variable—as an alternative measure for the extent of democracy and the quality of political institutions. The results are very similar to the ones reported below for political rights.

**Table 5**  
Robustness to additional control variables.

	Dependent variable: Average Trust, 1981–2008									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Polar. (Polit. ideol.)	–32.41*** [10.64]	–33.61*** [10.81]	–27.64*** [10.06]	–31.71*** [10.63]	–31.62*** [10.52]	–32.52*** [10.77]	–31.99*** [11.41]	–32.40*** [10.57]	–32.39*** [10.72]	–24.58** [10.73]
Mean Pol. Ideol.	3.698 [2.843]	3.588 [2.858]	2.7937 [2.660]	5.075 [3.078]	4.903* [2.906]	3.595 [3.020]	3.795 [3.001]	2.707 [2.819]	3.718 [2.871]	4.066 [2.811]
Fract. (Lang.)	–7.601** [3.806]	–8.088* [3.881]	–6.963* [3.549]	–6.169 [3.995]	–3.938 [4.389]	–7.638* [3.850]	–7.450* [4.079]	–8.909** [3.805]	–7.681* [3.913]	0.881 [4.424]
Genetic diversity	–30.31 [24.71]	–32.55 [25.01]	–52.14** [23.91]	–33.39 [24.80]	–10.79 [27.24]	–29.98 [25.09]	–30.62 [25.06]	–44.79* [24.96]	–30.36 [24.91]	–59.17** [28.61]
Qual. of institutions.		–0.633 [0.891]								–0.176 [1.168]
Political rights			–2.359*** [0.747]							–2.829*** [1.004]
Absolute latitude				0.104 [0.0902]						0.237** [0.119]
Sub-Sahar. Africa					–7.394 [4.570]					–4.778 [4.849]
Post-Communism						–0.294 [2.729]				–7.463** [3.419]
Share pop. age 65+							0.0377 [0.348]			0.488 [0.403]
Yr. of state formation								0.0424* [0.0217]		0.0400* [0.0212]
Civil war since 1970									0.249 [2.425]	–3.014 [2.350]
Adj R-squared	0.69	0.69	0.73	0.69	0.7	0.69	0.69	0.71	0.69	0.77
Obs.	77	76	76	77	77	77	77	76	77	76

Note: In addition to the regressors listed, all regressions displayed also control for the variables listed in Table 2. Standard errors in brackets.

\*\*\*  $p < 0.01$ .

\*\*  $p < 0.05$ .

\*  $p < 0.1$ .

As we are interested in the role of value diversity, conditional on the extent of ethno-linguistic and genetic diversity present in the country, in Table 5, we not only report results for polarization in political values but also for ethno-linguistic fractionalization and genetic diversity.

With the exception of political rights and the year of state formation, none of the additional variables included have a significant effect on trust.<sup>17</sup> Countries with a longer history of stable state organization are more trusting, while the coefficient on the political rights variable indicates that trust is lower in democratic societies.<sup>18</sup> The effect of polarization in political values, though, remains significant at the 1–5% level in all cases; moreover, the magnitude of its effect is very similar to the coefficient shown in column 1, which replicates regression 8 of Table 3 and is based on a regression that only includes the basic covariates listed in Table 2. This status remains even when we include all the additional control variables simultaneously, as column 10 shows.

Linguistic diversity also shows significant correlations with trust. However, the relationship seems to be more sensitive to the choice of the included regressors. In particular, controlling for the degree of absolute latitude or including a dummy variable for Sub-Saharan African countries, where language diversity is particularly high, renders the coefficient for language diversity insignificant. Genetic diversity shows a significant correlation with trust in columns 3, 7 and 10. Since all three measures of diversity are correlated with one another, their estimated relationships with trust should be interpreted as partial correlations. In this context then, again, the present evidence suggests that variation in value diversity is an important factor behind the international variation in trust and this effect of diversity goes beyond what can be attributed to ethno-linguistic or genetic diversity.

As a third robustness test for our country level results, we consider a pooled OLS regression with wave-fixed effects to account for common time trends. Table 6, column 1, reports this result. To account for the presence of time-invariant country-specific factors, as a fourth test, in Table 6, column 2, we present a regression in first differences. The dependent variable is the change in trust between two waves and the regressors are the corresponding changes in values polarization and the other basic covariates,

<sup>17</sup> We also tested for the effect of human capital in light of Helliwell and Putnam's (2007) findings but did not find any evidence of a significant role of this variable. This is likely due to the strong correlation between human capital and GDP per capita. The effect of polarization in political values, in contrast, is unaffected by the inclusion of human capital in the regression. Furthermore, we tested whether countries with large populations of migrants have lower levels of trust but found no evidence for this proposition either.

<sup>18</sup> Note that this indicates a negative correlation between trust and political rights conditional on the other covariates, such as GDP per capita and income inequality. The unconditional correlation between trust and political rights is, in fact, as one would expect, positive. Replacing the level of political rights with the Polity IV measure of the extent of democracy present in the countries produces very similar results: Conditional on the other covariates, the level of democracy is negatively correlated with trust.

**Table 6**  
Pooled OLS and changes regressions.

	Pooled OLS with wave-FE (1)	Changes regression (1995–2008) (2)
Polarization (political ideology)	–17.03*** [6.212]	–27.06** [12.11]
Mean political ideology	2.056 [1.649]	–7.958** [3.759]
Gini	–0.159** [0.0803]	0.159 [0.339]
GDP per capita	0.000246*** [7.67e–05]	0.000688 [0.000407]
Population	1.89e–05*** [5.14e–06]	–3.95E–05 [6.06e–05]
Monarchy	8.781*** [2.139]	–
% Protestants	–0.0600*** [0.0212]	–
% Catholics	0.206*** [0.0375]	–
Adj R-squared	0.66	0.27
Obs.	185	39

Note: Column 1 shows robust standard errors, clustered at the country level. Standard errors in brackets.

\*\*\*  $p < 0.01$ .

\*\*  $p < 0.05$ .

\*  $p < 0.1$ .

provided they are time-variant. By studying the changes in trust and the independent variables rather than analyzing their relationship in levels, unobservable country-specific factors drop out of the equation.

Because the sample sizes in waves 1 and 2 are small and the time intervals between waves 3 and 4 or 4 and 5 are very short, a comparison between waves 3 and 5 is the most suitable option. Thus, the regression displayed in Table 6, column 2, explores the effect of changes in the variables listed between waves 3 and 5 (1995–2008) on the change in trust over the same time period. We do not include the religious shares and the monarchy dummy here because these variables are time-invariant.

As Table 6 shows, polarization in political values remains significantly and negatively related to trust, a finding that holds true for both the pooled OLS regression and the regression in first differences. This finding indicates, first, that the relationship between cultural diversity and trust is not driven by the averaging of observations across waves but holds true at various points in time. Second, the regression in first differences indicates that, *ceteris paribus*, countries that became more polarized along political ideological lines over this roughly 10-year period also became less trusting. The effect size is similar to that reported in the levels-regressions: A one-standard-deviation decrease in polarization in political values is associated with a 0.37 standard deviation increase in trust.<sup>19</sup>

### 3.4. Endogeneity

It is possible that trust influences value diversity rather than the other way around or that value diversity is correlated with other unobserved variables that are also correlated with trust. We try to account for this endogeneity by employing an instrumental variable (IV) strategy.

Our IV strategy is based on the idea that as a consequence of gradual spreading of values and norms across borders and historical migration patterns, key human values in a given country tend to be similar to those present in neighboring countries. For this reason, also value diversity tends to be similar in neighboring countries. Given this, we propose to use as an instrument for value diversity in a country of interest the weighted average of value diversity observed in the countries that are directly bordering the former. This idea is similar to the instrumental variable strategy proposed by Alesina and Zhuravskaya (2011) and Klasing (2013).

We consider a country a neighbor of another one if it shares a common land border or sea border with the former. For countries that share a sea border, we follow the standard practice and only consider countries to be neighbors if their coastlines are less than 150 miles apart (Senese, 2005 and Gartzke, 2007), which is the distance a sailing boat can travel in 1 day.

We follow Klasing (2013) and calculate the weight each neighbor takes in the weighted average based on the length of the common border, the distance between the coastlines in the case where the border is a sea border, and the population density in the neighboring countries relative to that in the focal country. These weights are then multiplied with the corresponding level of value diversity in each of the neighboring countries to produce a weighted average of the neighboring countries' level of

<sup>19</sup> Since the level of political rights was shown to be significantly correlated with trust and this variable is time-varying, we can alternatively also control for the changes in political rights in addition to the changes in the variables listed in Table 6. Whether we do so or not does not qualitatively affect the results for value diversity.

**Table 7**  
IV-Regressions: baseline results.

Panel A: No controls	OLS	IV 2nd stage	IV 1st stage
Polarization (political ideology)	-63.91*** [9.61]	-73.07*** [14.52]	
Predicted polarization (political ideology)			0.619*** [0.088]
Obs.	69	69	69
1st stage <i>F</i> -test			49.28
Panel B: basic controls	OLS	2nd stage	1st stage
Polarization (political ideology)	-30.83** [13.04]	-68.19*** [38.92]	
Mean political ideology	0.398 [3.181]	2.626 [3.808]	0.055* [0.0299]
Fractionalization (Language)	-4.85 [3.931]	-5.632 [3.925]	-0.0324 [0.0382]
Genetic diversity	-33.21 [25.33]	-15.99 [30.03]	0.638** [0.248]
Predicted Polarization (Political ideology)			0.220** [0.0847]
Obs.	67	67	67
1st stage <i>F</i> -test of excluded instrument			6.75
Panel C: full controls	OLS	2nd stage	1st stage
Polarization (Political ideology)	-30.45** [13.95]	-104.79* [63.51]	
Mean political ideology	2.334 [3.262]	3.271 [3.570]	0.0166 [0.0329]
Fractionalization (Language)	-1.872 [4.829]	-8.065 [7.283]	-0.08667* [0.0472]
Genetic diversity	-56.00* [31.58]	-21.17 [44.43]	0.594* [0.320]
Predicted polarization (Political ideology)			0.148* [0.0884]
Obs.	67	67	67
1st stage <i>F</i> -test of excluded instrument			2.79

Note: The basic controls include all the control variables listed in Table 2. The full set of controls includes in addition to the former the variables listed in Table 5, column (10). Standard errors in brackets.

\*\*\*  $p < 0.01$ .

\*\*  $p < 0.05$ .

\*  $p < 0.1$ .

value diversity. This weighted average forms our instrument for value diversity in the focal country. In light of the finding above that diversity with regard to political values is the most important dimension of value diversity for explaining the international variation in trust, we focus our analysis on this dimension of value diversity and calculate our instrument based on the level of polarization in political values observed in each country's neighbors.

The first set of IV-regressions is presented in Table 7. Columns (2) and (3) show the second and first stage of the 2SLS regression respectively. Because the sample size here (67) is smaller than in the OLS case (77), due to a lack of data,<sup>20</sup> column (1) presents for comparison also the corresponding OLS results for this reduced sample. In the first part (Panel A), we do not include any control variables but just consider the effect of polarization in political values alone. As we can see, polarization in political values has a significant and strong negative relationship with trust. Furthermore, the first-stage regression and the *F*-statistic show that our proposed instrument is significantly positively correlated with the actual level of polarization in political values observed in our sample countries.

In Panel B of Table 7, we include the basic control variables listed in Table 2, which we had shown to be important correlates of trust and which we therefore included in all the previously shown regressions. We also control for the level of linguistic fractionalization and genetic diversity in our sample countries. We include these variables because we want to assess whether the relationship between value diversity and trust holds conditional on other important dimensions of diversity. Without controlling explicitly for linguistic fractionalization and genetic diversity in the focal country, it is possible that our instrument for value

<sup>20</sup> Compared to the OLS case, we are losing in total 10 observations. Eight of these cases arise because we do not have information for the selected WVS questions in any of the neighboring countries. We are losing another two countries, Egypt and Jordan, because these countries are the only neighbors to one another in our dataset (out of potentially five in each case). They are not even direct neighbors as they just share a tiny, less than 20 km long, sea border through the Gulf of Aqaba. Hence these two countries are expected to have very little in common in terms of their values, which makes the inclusion of these two countries in the IV-regressions problematic.

diversity picks up the effect of linguistic and genetic diversity on trust rather than the effect of polarization in political values per se. Reassuringly, though, as Panel B in Table 7 demonstrates, adding the basic control variables and linguistic and genetic diversity to the regression does not affect the results: Polarization in political values, when instrumented with the corresponding level of polarization in neighboring countries, remains statistically significantly related to trust with the expected negative sign. The first-stage regression results and the *F*-statistic, which exceeds the Stock–Yogo critical value (Stock and Yogo, 2005) of 6.6 necessary in order to limit the IV-bias to 20% of the OLS bias, indicate that the IV-regression does not suffer from a weak instrument problem.

In Panel C, we include simultaneously all the additional control variables that we analyzed in Table 5, which have been argued to be correlated with trust. Trust remains significantly negatively correlated with polarization in political values when the latter is instrumented by the corresponding value in each country's neighboring states. Note that the first-stage *F*-statistic is small as a consequence of the many regressors included, so we cannot rule out that the estimates are not biased due to weak instruments.

For the neighboring countries' level of value diversity to be a valid instrument for value diversity in the focal country, it has to be that (1) the former is sufficiently highly correlated with the latter and that (2) it does not affect trust in the focal country other than through its correlation with value diversity in the focal country. That is, the underlying assumption in the second case is that value diversity in neighboring countries does not have a direct effect on trust in the focal country. We tested the first assumption directly and as visible from the reported *F*-statistics, the correlation in the baseline specification B is indeed sufficiently high to rule out a weak-instrument problem. The second assumption, though, cannot be directly tested. We think that it is in general a reasonable assumption to make, but we acknowledge potential channels of influence that may violate the exclusion restriction.

The most pressing concern is that the WVS/EVS question on trust does not specify what "people in general" means. It could be that people answering this question do not only consider their fellow citizens when thinking about whether they trust people or not, but also the citizens of neighboring countries. Thus, if neighboring countries have certain attributes that influence the extent to which people in the focal country trust citizens from these countries (which is partially captured in the answer to the general trust question) and if these attributes are correlated with the degree of value diversity in these countries, the exclusion restriction underlying our instrumental variable strategy would be violated. In other words, we need to rule out that the level of polarization in political values observed in neighboring countries is correlated with other attributes that affect the extent to which a country trusts its neighbors.

Unfortunately, the WVS/EVS data set provides no information on the extent to which people trust the citizens of other countries explicitly.<sup>21</sup> However, we can control for variables that likely influence the extent to which people trust the residents of neighboring states. A first set of plausible candidates would include variables that reflect the degree of institutional quality, corruption, and violence, all variables which have been argued to be generally correlated with trust. The idea is that people may trust people from another country less if they consider them to be corrupt and violent, and the country to be run by a bad government. Secondly, in light of the fact that income inequality is strongly correlated with trust, it is possible that the extent to which people trust their neighbors depends on the income gap between the focal country and its neighbors. Third, as documented by Guiso et al. (2009), cultural similarity and genetic distance between countries are the most important predictors of bilateral trust. In light of these arguments, in what follows, in Table 8 we add a variety of additional control variables to the basic controls used in Table 7 Panel B in order to rule out that our IV-regression results are driven by certain omitted characteristics of the neighboring countries that affect directly the extent to which the latter are trusted by people in the focal country.

In the first two columns, we add measures of institutional quality and armed violence in the neighboring countries. The measure of the quality of institutions we employ is the commonly used aggregate index reported by International Country Risk Guide, which reflects the level of corruption, law and order, and bureaucratic quality in a country. To measure the extent of violence, we use as a proxy the number of armed conflicts in which a country's government was involved, reported in the UCDP/PRIO Conflict Database.<sup>22</sup> Both variables are averaged over the sample period 1981–2005 and the weighted average for each set of neighboring countries is then calculated by applying the country-weights described above that we used to construct the instrument for polarization. To not overcrowd the tables, we only report the coefficients and standard errors for polarization in political values and the control variable of interest. In all columns, though, we also control for the variables employed in Table 7, Panel B. The bottom of the Table 8 reports the first-stage *F*-statistic for the excluded instrument. As one can see, controlling for institutional quality and armed conflicts in the neighboring countries does not qualitatively affect our previous results. The level of significance of polarization in political values falls just slightly below the commonly accepted threshold value of 0.1 when we control for institutional quality in the neighboring states, but it can still be considered marginally significant. Controlling for armed conflicts in the neighboring countries does not affect our previous conclusions either.

In column (3) we control for the gap in per-capita incomes between the focal country and its neighbors, calculated as the weighted average of the ratio of per-capita incomes between the focal country and each of its neighbors. As we can see, also the inclusion of this variable does not affect our previous findings. The instrumented value of polarization in political values remains significantly negatively related to trust.

In columns (4) and (5) we add measures of cultural distance and genetic distance between the focal country and its neighbors. To measure the cultural distance, we employ the weighted average of the absolute difference in political values in the focal country and each of its neighboring countries, measured, as before, by the average response to the six WVS/EVS questions that

<sup>21</sup> As shown by Guiso et al. (2009), this information is only available for a small set of 15, mostly European, countries and can hence not be employed in the present cross-country setting.

<sup>22</sup> The data for both variables were taken from the QoG Standard Data Set, provided by the Quality of Government Institute at the University of Gothenburg. The data set is accessible online at: <http://www.qog.pol.gu.se/data/datadownloads/>.

**Table 8**  
IV-Regressions: testing the exclusion restriction.

	Dependent variable: Average Trust, 1981–2008				
	(1)	(2)	(3)	(4)	(5)
Polarization (Political ideology)	-63.13 <sup>a</sup> [40.87]	-115.73 <sup>**</sup> [51.17]	-65.34 <sup>*</sup> [35.86]	-67.88 <sup>*</sup> [38.37]	-68.00 <sup>*</sup> [38.79]
Mean political ideology	2.322 [3.830]	3.748 [4.588]	2.489 [3.683]	1.422 [3.76]	2.38 [3.801]
Neighbor's quality of institutions	5.871 [7.718]				
Neighbor's armed conflicts		2.347 <sup>a</sup> [1.49]			
Income gap with neighbors			-0.0712 [0.305]		
Cultural distance to neighbors				6.32 [5.108]	
Genetic distance to neighbors					-0.00127 [0.00299]
Obs.	67	67	67	67	67
F-statistic for excluded instrument	5.85	5.65	7.8	6.68	6.66

Note: In addition to the regressors listed, all regressions displayed also control for the variables listed in Table 2 in the manuscript. Polarization in political values is instrumented with the corresponding average level in the neighboring countries. Standard errors in brackets.

\*\*\*  $p < 0.01$ .

\*\*  $p < 0.05$ .

\*  $p < 0.1$ .

form the political ideology dimension. Data on genetic distance between countries are taken from Spolaore and Warczarg (2009). As before, to calculate weighted averages we employ the same weights that we used in the construction of our instrument. As one can see, also the inclusion of these two variables does not change our findings of a significant negative relationship between diversity in political values and trust. The  $F$ -statistics reported in the bottom of the table show that in all cases the bias introduced by using the IV-estimator is no more than 20–25% of the OLS bias. Hence we can rule out that the results are driven by a weak-instrument problem.

#### 4. Trust and diversity at the regional and individual level

##### 4.1. Regional-level analysis

We explore in this section the sub-national nature of our sample of European countries by exploiting the variation in trust and value diversity across regions within countries. The advantage of this regional approach is that we can explicitly control for country level effects. The analysis of the link between value polarization and trust at the sub-national (regional) level is based on estimating a regression of the following form:

$$T_{jc} = \alpha + \beta D_{jc} + \gamma V_{jc} + \delta X_{jc} + \theta_c + \varepsilon_{jc}, \quad (3)$$

where  $j$  indicates regions and  $c$  countries, and  $\theta_c$  is a country fixed effect capturing any sort of heterogeneity between countries. As before,  $D$  refers to the degree of value diversity,  $V$  to the mean values and  $X$  to other covariates. Thus, the regression is equivalent to Eq. (2) used in the cross-country analysis, with the addition of the country fixed effect.

To estimate this regression, we use the 2008 wave of the EVS, which provides detailed information on where the respondents reside. Specifically, regional information can be obtained, depending on the size of the country, at either the NUTS1 level (for larger countries) or the NUTS2 level (for smaller countries).<sup>23</sup> Given that the EVS contains the same 17 survey questions we used to construct our measures of value diversity at the country level as well as the same trust question, we can generate corresponding indices at the regional level by mapping each respondent interviewed in EVS 2008 into a NUTS region and calculating trust scores and value diversity scores at the regional level using the data from the individuals residing in each of the NUTS regions. To ensure representativeness at the regional level, our analysis only includes a region if at least 65 respondents from that region answered the trust question. Furthermore, we include a country only if we have information from at least three regions in the country.

With regard to the variables contained in  $X$ , we consider the level of GDP per capita, population size, the Gini coefficient, and the share of Protestants and Catholics in each NUTS region to construct a set of covariates equivalent to those used in

<sup>23</sup> The acronym NUTS refers to the Nomenclature of Territorial Units for Statistics and is a standard for the subdivision of European countries, developed and maintained by the European Union. Using the NUTS classification system to define regions greatly facilitates the analysis because other disaggregated information (e.g., GDP, population size, income inequality) is typically also made available at NUTS levels.

**Table 9**  
Trust and value diversity at the regional level.

	Dependent Variable: regional trust, 2008		
	(1)	(2)	(3)
Polarization (Political ideology)	-0.316** [0.154]	-0.314** [0.152]	-0.293* [0.173]
Mean political ideology	-0.0144 [0.0383]	0.0126 [0.0417]	0.0184 [0.0540]
Gini	-0.836** [0.354]	-0.874** [0.351]	-0.518 [0.441]
GDP per capita	4.98e-06*** [1.50e-06]	5.19e-06*** [1.49e-06]	5.49e-06*** [1.76e-06]
Population	-7.03E-10 [3.05e-09]	-9.19E-10 [3.01e-09]	4.73E-09 [4.09e-09]
% Protestants	0.101* [0.0599]	0.142** [0.0651]	0.272 [0.175]
% Catholics	0.363*** [0.0665]	0.376*** [0.0661]	0.318 [0.267]
East Germany Dummy		0.0746 [0.0489]	0.239 [0.160]
Country fixed effects	NO	NO	YES
Adj R-squared	0.54	0.61	0.68
Obs.	58	58	58
No. of countries	19	10	10

Standard errors in brackets.

\*\*\*  $p < 0.01$ .

\*\*  $p < 0.05$ .

\*  $p < 0.1$ .

the cross-country regressions reported in Table 2. GDP per capita and population size data for 2008 are from Eurostat. Data on income inequality are from a publication by GHK Consultancy (GHK, 2010) that presents information on income inequality across European regions, calculated from individual-level information taken from the 2007 European Union Statistics on Income and Living Conditions (EU-SILC). The share of Catholics and Protestants in each region is the share of Catholics and Protestants in the sample population of EVS 2008. In total, we have information on trust, value diversity, and all the above-mentioned control variables for 58 regions in 10 countries.<sup>24</sup>

Table 9 shows the results of the regional-level regressions. In column 1, we run a simple regression without country fixed effects. In column 2, we add a dummy variable indicating the regions of Germany previously belonging to the German Democratic Republic. This variable is included to accommodate the substantial differences in political values between East and West Germans and stronger intergenerational differences in East Germany as a consequence of older East Germans' exposure to socialism, which have been documented, among others, by Alesina and Fuchs-Schundeln (2007) and Van Hoorn and Maseland (2010).

The regional level of diversity in political values is significantly negatively correlated with the regional level of trust. The effects of the remaining regional-level variables have the expected signs and are consistent with what we found at the country level. Trust is higher in wealthier regions, regions with low income inequality and regions with a high share of Protestants in the population. Even when accounting for country-specific factors in column 2, we still observe a significant negative relationship between regional levels of value diversity and regional levels of trust. This implies that even within countries, regions that are characterized by high diversity in political values, ceteris paribus, have lower trust levels than less diverse regions.

#### 4.2. Individual-level analysis

An analysis at the individual-level allows us to provide additional insight into the nature of the relationship between trust and value diversity. We test whether the level of value diversity observed in the region where an individual resides affects the level of trust expressed by the individual. Social identity theory suggests that this should be the case since individuals are less likely to trust strangers if they are likely to encounter people who are very different from themselves. A single person cannot influence the degree of value diversity in the area where he or she resides; thus, our analysis of individual-level data allows us to shed more light on the direction of causality between trust and value diversity.

To test whether value diversity affects the level of trust expressed by an individual, we run the following probit regression:

$$T_{ijc} = \alpha + \beta D_{jc} + \gamma V_{jc} + \delta X_{jc} + \delta Z_{ijc} + \theta_c + \varepsilon_{ijc}. \quad (4)$$

$T_{ijc}$  is equal to 1 if an individual  $i$  living in region  $j$  in country  $c$  answers, "Yes, most people can be trusted" and 0 if he or she says, "You can't be too careful."  $D_{jc}$  and  $V_{jc}$  refer to the level of diversity in political values and the average political values in the region

<sup>24</sup> These countries are Austria, Belgium, Czech Republic, Finland, Germany, Spain, Italy, France, Hungary and Poland.

**Table 10**  
Individual trust and value diversity (probit regressions).

	Dependent variable: individual trust, 2008			
	(1)	(2)	(3)	(4)
Regional polarization (Political ideology)	-1.227*** [0.253]	-1.168*** [0.371]	-1.353*** [0.430]	-1.466*** [0.489]
Regional political ideology	0.210*** [0.0585]	0.106 [0.0741]	0.0292 [0.110]	0.0883 [0.127]
Female	0.00962 [0.0307]	0.0122 [0.0309]	0.00889 [0.0310]	0.0163 [0.0343]
Age	0.000679 [0.000940]	0.00059 [0.000964]	0.000393 [0.000969]	0.000964 [0.00108]
Intermediate education	0.225*** [0.0398]	0.244*** [0.0416]	0.240*** [0.0418]	0.257*** [0.0464]
High education	0.606*** [0.0482]	0.622*** [0.0497]	0.616*** [0.0499]	0.618*** [0.0560]
Protestant	0.196*** [0.0677]	-0.0525 [0.0811]	-0.0559 [0.0828]	0.00456 [0.100]
Catholic	-0.0809 [0.0608]	-0.0247 [0.0623]	-0.0417 [0.0631]	0.0223 [0.0774]
Married	-0.0213 [0.0316]	-0.000282 [0.0320]	-0.00729 [0.0321]	-0.0147 [0.0357]
Unemployed	-0.216*** [0.0710]	-0.196*** [0.0717]	-0.187*** [0.0720]	-0.161** [0.0794]
Household income	0.0798*** [0.0120]	0.0619*** [0.0124]	0.0597*** [0.0124]	0.0618*** [0.0136]
Gini			-2.757*** [0.858]	-3.234*** [0.997]
GDP per capita			2.00e-05*** [3.81e-06]	2.04e-05*** [4.55e-06]
Population			1.52e-08** [7.44e-09]	2.13e-08** [8.74e-09]
% Protestants			1.328** [0.526]	1.456** [0.613]
% Catholics			1.145*** [0.346]	1.211*** [0.410]
East Germany Dummy			1.002*** [0.317]	1.133*** [0.377]
Country fixed effects	NO	YES	YES	YES
Adj. R-squared	0.072	0.085	0.091	0.075
Obs.	7577	7577	7577	6220

Standard errors in brackets and clustered at the regional level.

\*\*\*  $p < 0.01$ .

\*\*  $p < 0.05$ .

\*  $p < 0.1$ .

where the individual resides.  $X_{jc}$  denotes other regional-level characteristics.  $\theta_c$  is a country fixed effect intended to capture country-level differences in institutional quality, policies, etc. on that may influence whether a person is trusting or not. Finally,  $Z_{ijc}$  denotes individual-level observable characteristics, including gender, age, education, marital status, religious denomination, employment status, and household income.

The main data used for the individual-level analysis are, just as in the regional-level case, taken from EVS 2008. The regional-level score of diversity with regard to political values is calculated as outlined above in section IV.1, and the regional-level control variables ( $X_{jc}$ ) are also identical to the ones used in Table 9.

The results from the individual-level regressions are shown in Table 10. Column 1 includes only the set of individual-level characteristics in addition to the key variables of interest, namely the regional level of polarization in political values and average political values in the regions. As expected, we find that individuals living in regions characterized by high diversity in political values are significantly less likely to trust strangers than otherwise identical individuals living in less diverse regions. With regard to the individual characteristics, compared with the excluded group of individuals with little or no education, educated people are more trusting, and the effect increases with the level of education. Wealthy people and Protestants are also more trusting, while unemployed individuals are less trusting.

In column 2, we add country fixed effects. The inclusion of these fixed effects does not affect the estimated coefficient on value diversity. In column 3 we also include the regional-level variables used in Table 9 to ensure that the significant effect of value diversity in the region of residence is not driven by the omission of these correlates of regional trust and regional diversity in political values. Including these region-specific factors does not affect the estimated effect of value diversity either. We still find that individuals living in regions characterized by high value diversity, or more specifically, regions with high polarization



in values regarding economic policy issues, are *ceteris paribus* less trusting than individuals living in regions that are more homogenous in terms of their political values.<sup>25</sup>

A single individual cannot influence the level of value diversity in his or her region. Thus, it is unlikely that reverse causality is behind the estimated relationship. It could be, though, that individuals systematically select themselves into regions based on the local level of value diversity. In other words, if high-trust individuals prefer to live in more homogenous regions and take deliberate actions to move into such regions, the estimated relationship between regional value diversity and individual trust would be spurious. We can account for this partially by limiting our regression sample to individuals who already lived in their current region of residence as children.<sup>26</sup> This approach would exclude individuals who moved into the region as adults and who may have chosen the region based on their preferences regarding diversity in the region. The regression results for this sub-sample of individuals are reported in column 4. They are qualitatively identical to those shown in column 3. In light of these findings, the fact that we found no effect of migration on trust at the country level (see footnote 17) and that regional mobility within Europe is generally low,<sup>27</sup> we believe that it is unlikely that strong self-selection forces are biasing our results. Thus, our regression results hint at the link running from diversity to trust formation and not the other way around, in line with what the IV regression at the country level suggested.

## 5. Conclusion

High diversity within societies is commonly associated with poor socioeconomic outcomes. To date, researchers have conceptualized diversity as ethnic, religious, and linguistic fractionalization and segregation, and as genetic diversity. We argue that an important dimension of diversity has been largely ignored in the literature due to lack of data, namely diversity in key human values.

We provide the first systematic attempt to measure value diversity at national and subnational levels. This measure reflects the degree to which key human values and beliefs are shared within societies and, importantly, not only accounts for whether members of the same society hold different values but also for the differences in the expressed values between individuals. Using this measure, we investigate whether higher levels of value diversity are associated with less cooperation and lower social cohesion, as reflected in reduced levels of generalized trust in societies.

We find that societies characterized by high levels of value diversity—especially with regard to political values regarding government intervention in markets and income redistribution—have lower levels of trust. This relationship holds at various levels of aggregation: the country level, the sub-national (regional) level and the individual level. It also holds when value diversity in each country is instrumented with the level of value diversity observed in neighboring countries. Moreover, we document that this relationship holds conditional on the degree of social diversity in other dimensions. These findings lead us to conclude that value diversity, and in particular diversity in values related to economic policy issues, is an important dimension of societal diversity and may play an important role not only for trust formation, but also for other socio-economic outcomes. We recommend future research on the role of diversity to include value diversity as an aspect of diversity in addition to existing measures, such as ethnic, linguistic and genetic diversity.

Our findings shed new light on the policy implications resulting from extant findings on the negative relationship between diversity and trust. Previous studies documenting an adverse effect of ethnolinguistic diversity on trust imply to some extent the use of more restrictive immigration policies as an instrument to control diversity within countries. This is a delicate issue: Not only are such policies complex, but there may also be large social costs to restricting international migration. Our findings on the role of value diversity suggest that public policy interventions directed toward integrating different ethnicities and language groups and fostering common values in society are of crucial importance for creating trust and promoting economic development in the long run. Thus, international migration and ethnic or linguistic diversity *per se* are not detrimental for trust; rather, problems arise when different ethnic groups are not well integrated in society. In that sense, our policy implications are less restrictive and discriminatory and allow for more flexibility in the concrete design of immigration and integration policies.

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<sup>25</sup> Because value polarization tends to be higher in capital cities, we also included at some point a dummy variable indicating the European regions that largely comprise only the capital of the country (e.g., the Prague capital region of the Czech Republic, the Brussels capital region of Belgium). This dummy variable was not significant and its inclusion did not affect the coefficient on regional value diversity. These results are therefore not reported here.

<sup>26</sup> EVS 2008 reports for each individual not only where he/she is currently residing, but also where he/she resided at the age of 14. Using this information, we can limit our sample to individuals for whom the region of residence and the region of childhood are identical.

<sup>27</sup> On average, every year approximately 1% of the EU15 population changes their region of residence (Huber, 2004). In Eastern European countries, which are also in our sample, geographic mobility is even lower. For comparison, in the United States, approximately 3% of the population move across state lines every year (Borjas et al., 1992)

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jce.2015.10.014](https://doi.org/10.1016/j.jce.2015.10.014).

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