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# Value Diversity and Regional Economic Development\*

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## Abstract

We investigate the link between culture and regional economic development within European countries. Considering a variety of cultural values, we provide evidence that it is the degree of diversity in these values at the regional level that strongly correlates with economic performance, rather than the prevalence of specific values. In particular, we show that greater value diversity is negatively associated with regional economic performance within countries, which also relates to lower institutional quality and poorer public goods provision. These patterns are robust even when diversity is measured on the basis of values expressed by emigrants residing outside their region of origin.

*Keywords:* Cultural values; regional income differences; sharedness of values

*JEL classification:* O18; O52; R11; Z10

## I. Introduction

How do values and attitudes influence economic development? This question has been the focus of a growing body of literature that investigates the potential links between culture and a variety of economic outcomes.<sup>1</sup> Initially, this body of literature on cultural economics, as it is commonly known, was centered on the notion of social trust. Higher levels of trust across countries and regions have been associated with faster growth (Knack

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<sup>1</sup>See Guiso *et al.* (2006), Fernández (2011), and Alesina and Giuliano (2015) for excellent surveys of that body of literature.

and Keefer, 1997), better functioning institutions (Tabellini, 2008), greater organizational efficiency (Bloom *et al.*, 2012), and stronger economic ties with the rest of the world (Guiso *et al.*, 2009). Over time, research on cultural economics moved beyond trust and started to investigate the economic impact of other dimensions of culture, such as work attitudes (Lindbeck and Nyberg, 2006), gender norms (Fernández and Fogli, 2009), views on the market economy (Alesina and Angeletos, 2005), and attitudes toward democracy (Glaeser *et al.*, 2007).

Existing research has so far mainly focused on the relationship between economic outcomes and the prevalence of specific cultural values, such as trust. In the context of such analyses, values expressed by different individuals are typically averaged at the level of a country or a region and then compared with economic outcomes at the same level of aggregation. Following this approach, researchers effectively ignore any differences in values across individuals in the same location and concentrate on how average values differ across locations.

However, as recent work by cross-cultural psychologists has shown, the degree of sharedness of values across individuals in different countries can vary (Schwartz and Sagie, 2000) and this variation can be larger within countries than across countries (Fischer and Schwartz, 2011). Gelfand *et al.* (2011) provide evidence that cultural values are more heterogeneous in countries where conformity pressure is weaker and deviant behavior is more tolerated. Furthermore, Au (1999) documents that not accounting for within-group differences in cultural values biases the inferences one can make regarding the effect of culture across groups.

In light of these findings, a natural question is how economic outcomes relate to the degree of sharedness or diversity in values within a society. While the notion of diversity has already attracted the attention of economists, diversity in terms of values is a dimension that has hardly been analyzed so far. Existing work has considered the role of diversity in terms of the genetic, ethnic, linguistic, and religious composition of the population across and within countries (Alesina *et al.*, 2003; Fearon, 2003; Michalopoulos, 2012; Ashraf and Galor, 2013) and has shown that, in most cases, its relationship with economic development is negative. For example, high diversity has been associated with slow economic growth (Easterly and Levine, 1997), low quality of institutions (La Porta *et al.*, 1999), and poor public goods provision (Alesina *et al.*, 2016).

In this paper, we focus on the notion of value diversity and investigate whether and to what extent differences in the degree of sharedness of values across individuals matter for economic performance.<sup>2</sup> We measure value

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<sup>2</sup>We prefer the term value diversity for our object of interest over cultural diversity, as the latter term can be interpreted more broadly and has already been used in contexts that are unrelated

diversity for five distinct groups of cultural values that relate to trust, gender norms, work norms, attitudes toward the market, and views on democracy. This gives us five distinct indicators of value diversity that capture key cultural values that previous work on cultural economics has identified as important. We also go beyond these specific groups of values and measure diversity for a broader range of values.

To isolate the impact of cultural values from that of institutions and other structural characteristics of national economies, we conduct our analysis at the subnational level and treat regions within countries as the unit of analysis. This approach has already been followed by Beugelsdijk and van Schaik (2005) and Tabellini (2010), who related levels of trust and social capital to regional economic performance. In contrast, however, we analyze the economic implications not only of one dimension of culture, but of multiple sets of cultural values and the degree of diversity in these values.

To mitigate the effect of other confounding factors that also vary at the subnational level from that of value diversity, we distinguish between values expressed by individuals who reside in a specific region and those expressed by individuals who were born and raised in that region but later emigrated out of it. This empirical strategy builds on work by Fernández and Fogli (2009), Alesina and Giuliano (2010), and Algan and Cahuc (2010), who have used it to analyze the role of culture based on samples of immigrants in the US. Following this strategy, which is often referred to as the epidemiological approach, we explore the predictive power of variation in cultural values that is not influenced by the prevailing economic conditions in each region.

For the purpose of our analysis, we combine data on economic development with data on values and attitudes for 246 regions in 21 European Union (EU) countries. On the basis of the data on values and attitudes, we construct measures of the prevalence of particular cultural values in different regions and the diversity in these values present across individuals. We then investigate how these measures relate to regional levels of gross domestic product (GDP) per capita in the context of income-level regressions capturing the long-run determinants of regional development, as in Gennaioli *et al.* (2013). Our regressions include country fixed effects to avoid identification problems caused by unobserved country-specific heterogeneity.

Our results suggest that diversity in cultural values has a sizeable negative association with regional economic development in terms of GDP per capita. We consistently observe this pattern for all five groups of values that we consider, as well as for broader indicators of value diversity. This

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to cultural values. For example, see Ottaviano and Peri (2006) as well as Ager and Brueckner (2013).

negative association that we obtain for value diversity is independent of the positive association that the prevalence of some of these values, such as trust, has with per capita GDP levels. Moreover, we show that the obtained relationship is robust to alternative econometric specifications, to alternative ways of measuring value diversity, to comparisons with other dimensions of societal diversity, and to the inclusion of a multitude of control variables reflecting other determinants of regional economic performance.

These findings highlight a novel channel through which culture relates to economic development: the presence or lack of shared values within the population. Exploring the nature of this channel, we demonstrate that it is quantitatively important and that the adverse effect of value diversity appears to operate through the quality of regional governance and the local provision of public goods. Thus, diversity in values can raise obstacles to good governance and cooperation at the regional level in a way similar to what classical political economy (Olson, 1982) and social psychology (Byrne, 1971) theories have suggested for other dimensions of diversity. This suggests that the degree of sharedness of values in a society is a critical aspect of culture, hitherto ignored, that deserves more attention.

The paper is organized as follows. In Section II, we briefly review previous work on cultural economics and highlight the main cultural values that this body of literature has focused on. In Section III, we describe our data sources and explain how we measure the prevalence of cultural values and the degree of diversity in these values for our sample of European regions. In Section IV, we present and discuss the main empirical results; in Section V, we present various robustness tests; and in Section VI, we explore the underlying mechanism. Finally, we present our conclusions in Section VII.

## II. Cultural Values and Economic Outcomes

While there are a variety of ways to think of culture and to analyze its interaction with economic outcomes (Beugelsdijk and Maseland, 2011), our approach builds on the definition commonly used by economists that views culture as a collection of values, attitudes, and beliefs that characterize social groups and are intergenerationally transmitted (Guiso *et al.*, 2006; Fernández, 2011).<sup>3</sup> This definition makes explicit the multidimensional nature of culture and implicitly justifies the focus in economic analyses

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<sup>3</sup>Alternatively culture can be defined as “the collective programming of the mind” (Hofstede, 1980), as a basis for interaction and shared understandings among group members (Kroeber and Kluckhohn, 1963; Wallerstein, 1990) and as a determinant of social norms and expectations, ultimately shaping the behavior of individuals and organizations (North, 1990).

of culture on particular cultural dimensions that are of economic relevance. This is the approach that most economists follow and, with that in mind, in the present paper, we concentrate on five dimensions of culture that have attracted attention within economics.

### *Trust*

The first dimension we consider is trust. As already alluded to in the previous section, this was the point of entry for most economists into the study of culture. Since the early empirical studies of Knack and Keefer (1997) and La Porta *et al.* (1997), which built on prior work in other fields of social science (Coleman, 1990; Putnam *et al.*, 1993; Fukuyama, 1995), there has been a surge of work investigating the link between trust and various economic outcomes, recently summarized by Algan and Cahuc (2014).

### *Work Norms*

A second dimension whose implications we investigate is work-related attitudes and norms. Since Weber's influential thesis on the link between the protestant work ethic and the Industrial Revolution, many scholars have explored the work-related behavior of individuals. Empirical work in this context has demonstrated a strong cultural component in this dimension (Algan and Cahuc, 2007; Fisman and Miguel, 2007; van Hoorn and Maseland, 2013). In particular, it has been shown that work norms affect individual labor-force participation decisions (Stutzer and Lalive, 2004; Giavazzi *et al.*, 2013) and working relations within firms (Ichino and Maggi, 2000; Guiso *et al.*, 2015). Work norms have also been shown to be closely related to family structures (Bentolila and Ichino, 2008; Alesina and Giuliano, 2010) and to interact with social insurance schemes (Lindbeck *et al.*, 1999; Lindbeck and Nyberg, 2006).

### *Gender Norms*

Gender norms exhibit systematic variation across countries and regions (Mammen and Paxson, 2000) and have been shown to be very persistent (Alesina *et al.*, 2013). Different norms and perceptions about the roles of men and women in society crucially affect women's fertility and labor-force participation decisions (Fortin, 2005; Fernández and Fogli, 2009) as well as their labor-market success (Vella, 1994; Tate and Yang, 2015). Even phenomena such as the gender gap in math scores and the limited success of women in sciences can be linked to the prevailing gender norms in countries (Guiso *et al.*, 2008; Reuben *et al.*, 2014).

*Attitudes toward the Market*

Our fourth dimension of culture relates to the extent to which people embrace the market economy. Attitudes toward the market reflect beliefs about the fairness of market outcomes and preferences about how much the government should interfere with such outcomes. These attitudes have been shown to provide the foundations for the presence and the reach of the welfare state (Alesina and Angeletos, 2005; Luttmer and Singhal, 2011) and they are shaped by the perceptions of the economic system that individuals develop early in life (Alesina and Fuchs-Schündeln, 2007; Giuliano and Spilimbergo, 2014). Moreover, distrust toward the market triggers increasing demand for regulation (Aghion *et al.*, 2010) and leads individuals to avoid available insurance options (Cole *et al.*, 2013).

*Attitudes toward Democracy*

Our fifth cultural dimension relates to attitudes toward democracy. Such attitudes are considered essential for the well-functioning of any democratically organized society (Przeworski and Limongi, 1993; Gerring *et al.*, 2005) and their emergence typically predates successful democratic transitions (Glaeser *et al.*, 2007; Inglehart and Welzel, 2010; Gorodnichenko and Roland, 2015). Positive attitudes toward democracy relate to the notion of a democratic political culture (Lipset, 1959; Almond and Verba, 1963), which has a long-standing tradition in political science. Recent work by economists has established that these attitudes are deeply ingrained in the memory of individuals and societies (Michalopoulos and Papaioannou, 2013; Giuliano and Spilimbergo, 2014).

Focusing on groups of values related to these five dimensions of culture, we assess how regional economic development is associated with the overall prevalence of these values as well as with the diversity in these values within the population of each region. This differs from previous work that has considered only the economic effects of value prevalence and has ignored the role of value diversity. We also extend our analysis to broader measures of value prevalence and value diversity that combine these five dimensions of culture and include values that go beyond these five dimensions.

**III. Data Sources and Empirical Strategy**

Our analysis is based on data for 21 EU countries. The focus on EU countries has the advantage that we can resort to data on regional economic performance reported by Eurostat, which are by construction comparable

across countries and regions. The reported data follow the EU-wide subnational division based on the Nomenclature of Territorial Units for Statistics (NUTS) system, which has a hierarchy of four levels. Level 0 is the highest level of aggregation that corresponds to the country as a whole and level 3 is the finest level of subdivision. We conduct our analysis for a sample of NUTS-2-level regions, which is the finest level of subnational division for which all of the necessary data are available. This corresponds, for example, in the UK to counties and in Germany to government regions (*Regierungsbezirke*). Overall, our sample includes 246 regions in 21 countries.<sup>4</sup> Below, we briefly describe our dependent variable, our explanatory cultural variables, and our main control variables. Details regarding the measurement and data sources for all variables are provided in Sections 1, 2, and 3 of the Online Appendix.

### *Dependent Variable*

To measure regional economic performance, we look at GDP per capita in each region. We focus our analysis on the level of GDP per capita, as our aim is to investigate the role of culture in explaining long-run development at the regional level and in accounting for the persistent nature of the development gaps present within EU countries. With that in mind, we abstract from the potential disruptions triggered by the recent financial crisis and conduct our analysis using GDP data for the year 2007.

### *Cultural Variables*

To measure the prevalence of cultural values and the diversity in these values, we use the responses to a wide range of questions asked in the 2008 wave of the European Values Study (EVS).<sup>5</sup> The EVS is the European counterpart of the World Values Survey and one of the most widely used sources for measuring values and attitudes across European countries and regions. The responses reported in the EVS are based on interviews conducted with a representative stratified random sample of the adult population. The first wave of the survey was conducted in 1981 for

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<sup>4</sup>From the 28 EU countries, we are forced to drop Croatia, Cyprus, Estonia, Latvia, Lithuania, Luxembourg, and Malta. Croatia is excluded as it joined the EU very recently and the available data are limited. The remaining six countries are excluded because they have no subnational division even at the NUTS 2 level due to their small sizes. Hence, for these countries, we cannot make any inter-regional comparisons.

<sup>5</sup>This choice might suggest a slight discrepancy with our dependent variable that is measured in 2007. However, the persistent nature of cultural values makes the exact timing of the interview largely irrelevant. Moreover, as we demonstrate in Section V, using data from earlier waves of the EVS leads to similar results.



a small sample of western European countries, while subsequent waves in 1990, 1999, and 2008 have expanded the coverage to more and more countries.

We focus on the most recent 2008 wave of the EVS. This is for two reasons. First, it provides the largest regional coverage, while earlier waves include regional markers only for a subset of the respondents. Using the 2008 wave allows us to conduct our analysis on the basis of the responses of 31,085 individuals from 246 NUTS-2 regions. Second, the 2008 wave is the only one that provides information on the region where each respondent lived as a child, as well as whether and where he or she has moved since then. This is crucial information for the application of the epidemiological approach, which is described in more detail below.

In total, the EVS contains 172 questions on values and attitudes. We primarily focus our analysis on a subset of 26 questions that best capture values related to the five dimensions of culture discussed in the previous section. The selection of questions is based on the application of factor analysis and reliability analysis to ensure that each set of questions captures one underlying dimension of culture. The results of these analyses are reported in Section 1 of the Online Appendix, while the selected 26 questions are listed in Table A1-8 of the Online Appendix. This table also indicates how we rescale the responses to the questions to fall on a range between 0 and 1 and to make them directly comparable to each other, with higher values indicating attitudes that are expected to be more conducive for economic development. The approach of quantifying cultural dimensions on the basis of responses to survey questions has a long tradition in cross-cultural studies (Hofstede, 1980; Inglehart and Baker, 2000; House *et al.*, 2004). Recently, it has also been gaining appeal in economics, and many of the 26 questions that we are employing have been used in related studies before.<sup>6</sup>

Having identified the set of questions capturing each of the five cultural dimensions of interest, we then aggregate the individual responses by first calculating for each question the average response in each region and then taking the mean of the regional average responses for each group of questions. This way, we can measure in each region the mean value orientation for each of the five cultural dimensions. To measure the degree of regional diversity along each dimension, we compute fractionalization scores based on a Herfindahl index that reflects the probability of two randomly drawn individuals from a given region differing in their values. Following an approach similar to the one we use to construct the regional

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<sup>6</sup>See, for example, Alesina and Angeletos (2005), Guiso *et al.* (2006), Algan and Cahuc (2007), Aghion *et al.* (2010), Lindqvist and Ostling (2010), and Giavazzi *et al.* (2013).

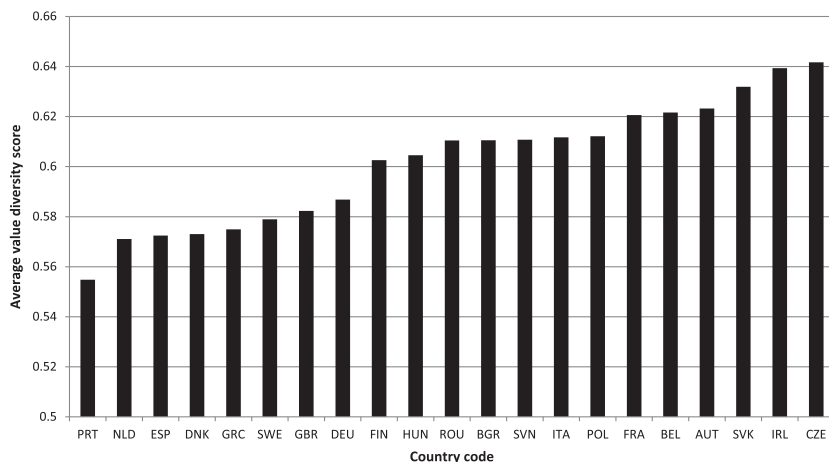
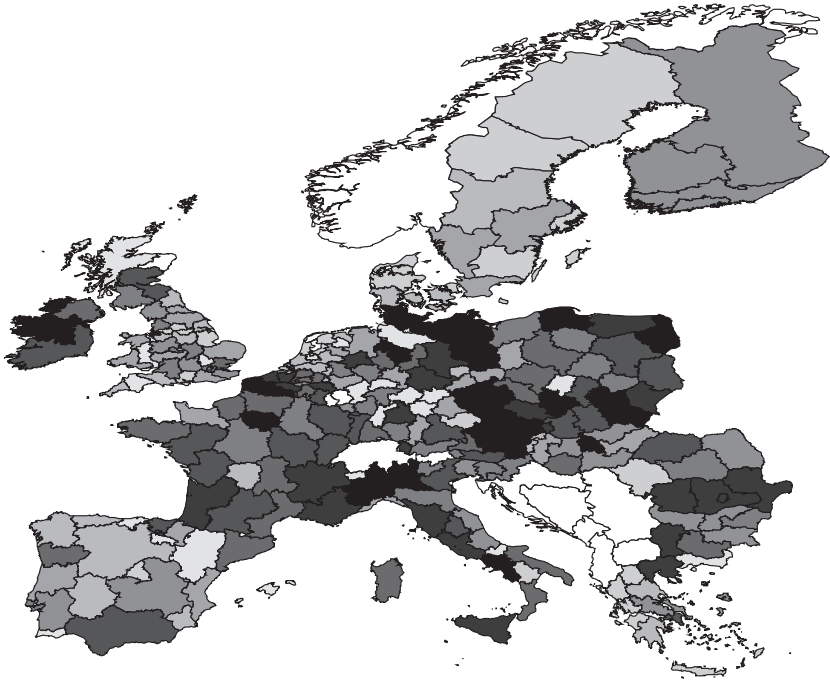


Fig. 1. Average value diversity in 21 EU countries

Notes: The figure displays the country-level average value diversity score, measured on the vertical axis, across our five cultural dimensions: trust; work norms; gender norms; attitude towards the market; and attitude towards democracy. The countries are indicated on the horizontal axis by the standard three letter ISO code.

mean value orientation scores, we first calculate a regional fractionalization score for each of our 26 selected questions. We then calculate for each region the average fractionalization score across the questions associated with each cultural dimension to capture the overall degree of value diversity along each of the five cultural dimensions. Diversity measures based on a Herfindahl index are standard in diversity research and have been used by, among others, Alesina *et al.* (2003) and Ashraf and Galor (2013) to quantify the levels of ethno-linguistic and genetic diversity, respectively. For robustness purposes, we also consider alternative measures of value diversity based on the standard deviation in the individual responses to the value questions and the Greenberg polarization index. Technical details regarding these diversity indices and their properties are discussed in Section 2 of the Online Appendix.

In addition to looking at value diversity for each of the five dimensions separately, we also study the average degree of diversity across the five dimensions in order to assess the degree of sharedness of values in each region more broadly. The variation in this broad measure of value diversity is visualized in Figure 1, which presents a bar diagram of the average value diversity scores aggregated at the country level, and Figure 2, which shows a heat map of Europe with the value diversity scores for each NUTS-2 region included in our sample. Darker colors in the map indicate higher levels of diversity. As can be seen from the two figures, value diversity



*Fig. 2.* Value diversity differences across 246 EU regions

*Notes:* The map reflects the region-level average value diversity score across our five cultural dimensions: trust; work norms; gender norms; attitude towards the market; and attitude towards democracy. Darker colors indicate greater value diversity.

varies systematically across countries, but the aggregated country scores mask sizeable variation in value diversity that is present within countries. In fact, the observed variation in value diversity within many large EU countries, such as Germany, Italy, and Spain, is larger than the variation in the country-average scores shown in Figure 1.

In our analysis below, we also go beyond these five dimensions of culture and consider diversity based on a wide range of values reflected in the EVS questionnaire. As we show in the next section, this also leads to similar conclusions regarding the role of value diversity to when we focus on diversity in terms of the five key cultural dimensions described above.

### *Control Variables*

Our main control variables reflect each region's educational attainment in terms of average years of schooling, population density, market potential measured as GDP in the surrounding regions, and the size of the agricultural

sector captured by its relative share in value added. These variables are included in all of our regressions as they have been established as key predictors of regional economic development (Gennaioli *et al.*, 2013). We also consider a wide range of additional control variables, which we introduce as we proceed. All details about the data sources for these control variables can be found in Section 3 of the Online Appendix.

#### **IV. Baseline Regression Results**

To assess the role of cultural values in accounting for the observed variation in regional economic development in EU countries, we regress the regional levels of GDP per capita on our measures of value diversity and mean value orientation for each of the five dimensions of culture described above. In these regressions, we always include our main set of control variables that capture key determinants of regional economic development: population density, market potential, average years of schooling, and the size of the agricultural sector. All explanatory variables are standardized to have a zero mean and a unit standard deviation. This facilitates the comparison of the estimated coefficients for these variables. Moreover, to capture the effects of additional unobserved country-wide development determinants, we also include in our regression set-up country fixed effects and cluster the standard errors at the country level.<sup>7</sup> Thus, our analysis focuses on the ability of our cultural variables to explain variation in GDP per capita within countries.

##### *Results Based on Resident Population Values*

Table 1 shows our first set of regression results. The first five columns of the table present the estimated coefficients for value diversity and mean value orientation for each of the five cultural dimensions. In all cases, the results suggest that greater value diversity is associated with lower levels of GDP per capita. In most cases, the relationship is significant at the 1 percent level and the coefficients indicate that the implied magnitudes are quantitatively important. On average, across the five dimensions, a reduction in value diversity by one standard deviation is associated with an increase in GDP per capita by 3.6 percent. This corresponds to about 50 percent of the effect size of market potential.

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<sup>7</sup>As the 21 country clusters are relatively few given our sample of 246 regional observations, in Tables A4-2 and A4-3 of the Online Appendix, we also report our baseline regression specifications from Tables 1 and 2 with the standard errors clustered at the finer level of NUTS-1 regions. Raising the number of clusters to 86 should increase the reliability of the estimated cluster-robust standard errors. However, this does not alter the statistical significance of our main coefficients of interest.

Table 1. Baseline regression results based on resident population values

	Trust (1)	Work (2)	Gender (3)	Market (4)	Cultural dimension Democracy (5)	Average of five dimensions (6)	All EVS value questions (7)
Value diversity	-0.034*** [0.012]	-0.043*** [0.013]	-0.035*** [0.011]	-0.032** [0.012]	-0.037*** [0.007]	-0.048*** [0.011]	-0.039*** [0.011]
Mean value orientation	0.060*** [0.013]	0.025 [0.015]	-0.054** [0.025]	0.071*** [0.023]	0.019 [0.013]	0.073*** [0.018]	-0.011 [0.028]
Population density	0.066** [0.031]	0.069* [0.034]	0.066** [0.030]	0.063** [0.030]	0.075** [0.033]	0.077** [0.032]	0.069** [0.032]
Market potential	0.071*** [0.018]	0.069*** [0.022]	0.069*** [0.019]	0.069*** [0.015]	0.064*** [0.017]	0.062*** [0.016]	0.077*** [0.023]
Schooling	0.148* [0.073]	0.139 [0.096]	0.159** [0.075]	0.164** [0.060]	0.136 [0.085]	0.129 [0.076]	0.146* [0.078]
Agricultural share	-0.094*** [0.031]	-0.101*** [0.032]	-0.103*** [0.035]	-0.091*** [0.030]	-0.094*** [0.031]	-0.090*** [0.029]	-0.098*** [0.033]
Countries	21	21	21	21	21	21	21
Observations	245	246	244	244	245	246	246
Within R <sup>2</sup>	0.60	0.58	0.59	0.63	0.59	0.62	0.58

Notes: The dependent variable is log GDP per capita. Independent variables are standardized to have a zero mean and a unit standard deviation. All regressions include country fixed effects. Robust standard errors clustered at the country level are shown in brackets. \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ .

Columns 6 and 7 show the estimation results using broader aggregates of value diversity and mean value orientation. In particular, Column 6 uses the average of the diversity and mean value orientation scores across the five cultural dimensions. Column 7 uses the average diversity and corresponding mean value orientation scores across all 172 values-related questions contained in the EVS and thus reflects diversity in terms of additional dimensions of culture. In both cases, the estimation results confirm the strong inverse relationship between value diversity and regional GDP per capita that we obtain when looking at each of the five distinct cultural dimensions.

In addition to the negative link between value diversity and economic development, the results of Table 1 indicate an important role played by each region's mean value orientation across the five cultural dimensions. Specifically, we find positive and significant coefficients for trust and pro-market values, indicating that regions that are more trusting and embrace the market economy more enjoy higher levels of GDP per capita. Democratic values and work norms are also positively related to regional economic development, but the resulting coefficients are not statistically significant at conventional levels. Finally, we find that more traditional views regarding the role of women in society are associated with higher income levels, although this relationship is not very robust, as we show later.

Comparing the estimated impact on regional GDP per capita of value diversity with that of mean value orientation, it should be noted that they are largely independent from one another. Table A4-1 in Section 4 of the Online Appendix reports the coefficients of value diversity and mean value orientation when estimated in separate regressions. In all cases, the coefficients are similar to those reported in Table 1 where they are estimated simultaneously. This suggests that the negative relation between value diversity and regional economic development is largely independent of the positive impact that the prevalence of specific values, such as trust, has. This is in line with the observation of a relatively low correlation between value diversity and mean value orientation scores, which ranges between 0.1 and 0.4, as reported in Table A1-11 of the Online Appendix.

The regression results also document the importance of the control variables, all of which have significant and consistent effects on regional levels of economic development. In line with previous studies (Ciccone and Hall, 1996; Redding and Venables, 2004; Gennaioli *et al.*, 2013), we find that GDP per capita is higher in regions that have more dense populations, access to a larger potential market, higher levels of schooling, and a smaller agricultural sector. These findings confirm the important role of human capital and economic geography forces in shaping the patterns of economic development within countries.

### *Results Based on Emigrant Values*

In spite of the clear and consistent patterns, the results reported in Table 1 should be interpreted with caution, as they might be subject to various kinds of biases. For example, it is possible that as regions develop, people become gradually more trusting, embrace the market economy more, and their attitudes might converge. These dynamics could lead to lower value diversity as well as higher levels of trust and pro-market attitudes in more developed regions. Similarly, it could also be that people with certain values choose to live in regions with particular economic characteristics. Thus, the level of economic development of a region might influence cultural values and also value diversity. Hence, our estimated effects in Table 1 might capture a relationship operating in the opposite direction.

To ensure that our regression coefficients indeed reflect the effects that value prevalence and value diversity have on regional levels of economic development and not the other way around, we implement an empirical strategy along the lines of the epidemiological approach proposed by several scholars (Fernández and Fogli, 2009; Alesina and Giuliano, 2010; Algan and Cahuc, 2010). The underlying rationale behind this approach is to exploit the portability of culture and study its effects on economic outcomes based on a population that originated from a given country or region but is no longer residing there. Due to the persistence of culture and the relatively slow assimilation of migrants, migrating individuals will end up retaining many of their original values even several years after moving to a different location. With this idea in mind, we repeat our previous analyses focusing on the values expressed by emigrants from a region whose values are bound to be similar to those of the resident population but are not affected by current local economic conditions.

To implement this empirical strategy, we exploit the fact that the 2008 wave of the EVS reports for all respondents both the region in which they were residing when interviewed and the region in which they were residing at the age of 14. On the basis of this information, we recalculate the value diversity and mean value orientation scores for each NUTS-2 region based solely on the responses of individuals who lived in that region at the age of 14, but who are currently residing in a different NUTS-2 region, in the same country or another.<sup>8</sup> Thus, the resulting value diversity and mean value orientation scores that we obtain this way for each region will be

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<sup>8</sup>An alternative approach would be to focus on values expressed by individuals who were already residing in their current region of residence at the age of 14 and ignoring those expressed by individuals who moved into the current region as adults. This approach gives similar results, but is less powerful as it corrects only for the self-selection problem.

unaffected by changes in the cultural values in the region driven by current economic conditions.

Table 2 reports the results from the re-estimation of the regressions shown in Table 1 using the cultural values expressed by emigrants from each region, instead of those expressed by the resident population. The results provide a strong confirmation of our earlier conclusion regarding the role of value diversity. Value diversity in terms of all five dimensions of culture as well as in terms of the broader aggregates has a significant negative relation with regional economic development measured by GDP per capita. The implied magnitudes of the effects are similar to those shown in Table 1. On average, across the five dimensions, a reduction in value diversity by one standard deviation is associated with an increase in GDP per capita by 3 percent.

For mean value orientation measured on the basis of emigrants, we find a weaker relationship with regional economic development compared with what we documented in Table 1. The estimated magnitudes are smaller and in no case do we find the coefficient estimates to be statistically significant. At the same time, the estimated effects of the control variables are very similar to those in Table 1. Overall, these results suggest that the sharedness of values has a more robust association with regional economic development than the prevalence of particular cultural values.

## **V. Robustness Checks**

Our analysis so far has demonstrated a strong negative association between value diversity and regional economic development within countries. In particular, the results based on emigrant values suggest that this association is present even if we eliminate the potential feedback effect that economic development might have on value diversity. Nevertheless, they do not fully preclude the possibility that the estimated relationship between diversity and development is driven by omitted variables operating at the regional level not explicitly controlled for. With that in mind, in the present section, we provide a set of additional regression results to ensure that this is not the case. Specifically, we test whether the obtained relationship is robust to alternative econometric specifications, to different ways of measuring value diversity, to considerations of other dimensions of societal diversity, and to the inclusion of a multitude of control variables reflecting other determinants of regional economic development. For brevity, the tables in this section report only the coefficients for value diversity and the additional regressors. Yet, we should note that all regressions include as regressors, in addition to the variables reported, the mean value orientation scores and the baseline set of control variables shown in Tables 1 and 2.



Table 2. Baseline regression results based on emigrant values

	Trust (1)	Work (2)	Gender (3)	Market (4)	Cultural dimension Democracy (5)	Average of five dimensions (6)	All EVS value questions (7)
Value diversity	-0.037* [0.020]	-0.035*** [0.010]	-0.024** [0.011]	-0.027* [0.015]	-0.029* [0.016]	-0.031* [0.017]	-0.033* [0.017]
Mean value orientation	0.028 [0.016]	0.016 [0.010]	-0.002 [0.009]	0.016 [0.011]	0.001 [0.015]	0.019 [0.016]	0.003 [0.010]
Population density	0.075** [0.031]	0.072** [0.031]	0.071** [0.033]	0.076** [0.032]	0.073** [0.031]	0.073** [0.033]	0.076** [0.032]
Market potential	0.078*** [0.018]	0.078*** [0.018]	0.076*** [0.020]	0.077*** [0.018]	0.077*** [0.020]	0.080*** [0.019]	0.080*** [0.019]
Schooling	0.128 [0.090]	0.133 [0.091]	0.134 [0.092]	0.125 [0.091]	0.131 [0.089]	0.132 [0.089]	0.126 [0.092]
Agricultural share	-0.091*** [0.032]	-0.092*** [0.032]	-0.091*** [0.032]	-0.094*** [0.033]	-0.093** [0.033]	-0.091*** [0.032]	-0.091*** [0.031]
Countries	21	21	21	21	21	21	21
Observations	245	246	244	244	245	246	246
Within R <sup>2</sup>	0.58	0.58	0.57	0.58	0.57	0.58	0.57

Notes: The dependent variable is log GDP per capita. Independent variables are standardized to have a zero mean and a unit standard deviation. All regressions include country fixed effects. Robust standard errors clustered at the country level are shown in brackets. \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ .

### *Measurement and Econometric Considerations*

One possible source of bias in our results could be due to regional characteristics that influence economic development at the subnational level, which we cannot directly measure and control for. To ensure that this form of unobserved heterogeneity is not driving our results, a key test is to employ a finer set of fixed effects in our empirical set-up. Given that our observations correspond to NUTS-2-level regions, we estimate our specification using fixed effects and clustering the standard errors at the NUTS-1 level instead of the country level. The results are shown in Panel A of Table 3 and confirm our findings in Tables 1 and 2. For most cultural dimensions, as well as for their combined average, we still observe a negative association of value diversity with regional GDP per capita levels, both when diversity is calculated on the basis of the responses of the resident population and when it is calculated on the basis of the responses of emigrants from each region. The estimated magnitudes are on average weaker and the levels of statistical significance are lower. Yet, this is most likely due to the fact that the number of NUTS-2 regions nested in each NUTS-1 region is small, which greatly reduces subnational variation in the data we can exploit.

Using NUTS-1-level or country-level fixed effects combined with error clustering at the respective level removes part of the spatial correlation in the error terms. Yet, the error term correlation might extend to nearby regions that are part of different NUTS-1 entities or countries. With that in mind, we also estimate our specification using a spatial error model that allows for error-term correlations across all neighboring regions.<sup>9,10</sup> The results for this set-up are shown in Panel B of Table 3. As we can see, previously unaccounted broader spatial correlation of error terms does not affect the negative relationship between value diversity and regional GDP per capita.

A further concern is that our results might be affected by noise in the value diversity scores due to the low number of respondents for some regions in the EVS. To exclude this possibility, we follow two alternative approaches. We impose a minimum threshold for the number of EVS respondents per region and we include information from earlier EVS waves. Panel C shows the results when we drop regions with fewer than 35 respondents. This reduces the sample size by about 45 observations, but

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<sup>9</sup>Following standard practice in the literature, we consider as neighboring regions all regions up to 400 km away from a given region, with their relative importance weighted on the basis of the inverse distance from the region of interest.

<sup>10</sup>When performing this estimation, we are forced to drop from the sample the Canary Islands region of Spain, which lies more than 1,200 km away from any other region in our sample.

Table 3. Robustness to measurement and econometric considerations

	Cultural dimension											
	Trust		Work norms		Gender norms		Market views		Democratic values		Average	
	Resid. (1)	Emig. (2)	Resid. (3)	Emig. (4)	Resid. (5)	Emig. (6)	Resid. (7)	Emig. (8)	Resid. (9)	Emig. (10)	Resid. (11)	Emig. (12)
<b>Panel A</b>												
NUTS-1 fixed effects	-0.016 [0.015]	-0.024** [0.012]	-0.047*** [0.018]	-0.026*** [0.009]	-0.002 [0.019]	-0.005 [0.011]	-0.029* [0.017]	-0.018 [0.011]	-0.041*** [0.015]	-0.012 [0.013]	-0.036* [0.019]	-0.019* [0.012]
<b>Panel B</b>												
Spatial error model	-0.035*** [0.011]	-0.037*** [0.013]	-0.052*** [0.014]	-0.034*** [0.013]	-0.035*** [0.013]	-0.024 [0.015]	-0.030*** [0.012]	-0.027** [0.011]	-0.037*** [0.012]	-0.030** [0.013]	-0.045*** [0.011]	-0.030** [0.013]
<b>Panel C</b>												
Respondents cut-off	-0.030 [0.024]	-0.048** [0.020]	-0.033* [0.016]	-0.026** [0.012]	-0.008 [0.022]	-0.019 [0.017]	-0.020 [0.015]	-0.030* [0.017]	-0.028*** [0.008]	-0.041* [0.020]	-0.045* [0.023]	-0.040** [0.018]
<b>Panel D</b>												
All EVS waves	-0.039*** [0.010]		-0.030*** [0.010]		-0.009 [0.018]		-0.023*** [0.007]		-0.031** [0.012]		-0.037*** [0.012]	
<b>Panel E</b>												
EVS wave 3	-0.008 [0.101]		-0.049* [0.026]		-0.056*** [0.016]		-0.144** [0.057]		-0.057** [0.027]		-0.089** [0.036]	
<b>Panel F</b>												
Standard deviation	-0.144*** [0.042]	-0.093** [0.043]	-0.045*** [0.012]	-0.021** [0.008]	-0.041** [0.015]	-0.023* [0.013]	-0.189** [0.069]	-0.100 [0.072]	-0.073*** [0.018]	-0.044** [0.020]	-0.207*** [0.051]	-0.083** [0.034]
<b>Panel G</b>												
Greenberg index							-0.034*** [0.011]	-0.028 [0.017]	-0.034*** [0.007]	-0.036** [0.015]	-0.053** [0.019]	-0.035** [0.016]

Notes: The dependent variable is log GDP per capita. We show results for EVS samples of residents (Resid.) and emigrants (Emig.). Reported coefficients show the effect of the indicated value diversity score. All regressions include country fixed effects, apart from Panel A, and control for population density, market potential, average years of schooling, the share of the agricultural sector, and the mean value orientation score. Independent variables are standardized to have a zero mean and a unit standard deviation. Robust standard errors clustered at the country level are shown in brackets, apart from Panel A, where standard errors are clustered at the NUTS-1 level. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

keeps our original results intact, with the exception of the case where we consider diversity in terms of gender norms. Panel D shows the results when we expand our sample of EVS respondents by including responses from all four EVS waves. This increases the total number of EVS respondents in our 246 regions of interest to 72,727. As only the 2008 wave of the EVS contains information on where the respondents were living as children, Panel D shows only the results for the resident population, but not for emigrants. Again, with the exception of gender norms, our earlier results are confirmed.

The findings in Panels C and D suggest that our conclusions do not hinge on the exact number of respondents based on which we calculate our cultural variables. This is not surprising given that the EVS respondents are sampled in such a way that they are representative of the underlying population. They also suggest that our results do not hinge on using data from a particular survey year. This is further confirmed in Panel E, where we employ the responses of individuals interviewed as part of the third (1999) wave of the EVS to compute the cultural variables instead of the fourth (2008) wave. Again, results can be obtained only for the resident population due to a lack of information on where the EVS respondents lived as children in the third wave. With the exception of the effect of diversity in terms of trust, the results confirm our earlier findings.

Another consideration regarding our results is that they might be driven by the exact way in which we measure value diversity. As already alluded to in Section III and further explained in Section 2 of the Online Appendix, the fractionalization index that we have used so far to measure value diversity reflects only whether the values expressed by individual respondents are different, but not the extent to which they are different. That is, they do not reflect the degree of similarity or dissimilarity in the values expressed between individuals. Yet, the latter might also be an important dimension of value diversity. To account for that, we repeat our analysis employing in Panel F the standard deviation of the individual values scores and in Panel G the Greenberg polarization index to measure value diversity. As the use of the polarization index requires questions with more than two possible answers, Panel G shows the results for this alternative measure of value diversity only for attitudes toward the market and democracy. Both Panel F and Panel G show that the use of these alternative measures of diversity yields results similar to the analysis based on the fractionalization index. This holds for both value diversity scores calculated on the basis of the responses of the resident population and those based on the emigrant population. This suggests that both diversity in the values expressed by individuals and the distance between them have a negative association with regional economic development.

*Comparisons with Alternative Dimensions of Diversity*

Beyond the above-discussed measurement and econometric concerns, it is important to ensure that our main results capture the effect of value diversity and not that of other related dimensions of diversity. We therefore re-estimate our baseline regressions including additional controls that reflect alternative dimensions of diversity. The results are shown in Table 4.

In Panel A, we consider the effect of diversity in terms of income measured with the standard Gini coefficient. In Panel B, we follow Castello and Domenech (2002) and include the Gini coefficient for education inequality. These variables are constructed on the basis of the information on individuals' household income and educational attainment in the 2008 EVS. As Panels A and B show, income and educational inequality across individuals in the same region are both unrelated to within-country income differences. Most importantly, our main finding of a negative and significant association between value diversity and GDP per capita is not affected by the inclusion of either measure of inequality.

Another important dimension of diversity that we need to consider is ethnic diversity. Prior work has demonstrated a negative relationship between ethnic diversity and economic development (Alesina and La Ferrara, 2005), but ethnic diversity might also be correlated with value diversity. In Panel C, we present our results controlling for ethnic diversity using information on ethnic groups reported by Weidmann *et al.* (2010). The relation between value diversity and regional economic development is not affected by the inclusion of ethnic diversity and the estimated coefficients for ethnic diversity are weak and statistically insignificant in all but one case. This result suggests, in line with the conclusions of Stichnoth and van der Straeten (2013), that ethnic diversity might be a less important determinant of economic performance in Europe than in other parts of the world. Furthermore, our findings on ethnic and value diversity are in line with those of Desmet *et al.* (2015) who show that ethnic and value diversity are not necessarily overlapping.<sup>11</sup>

In Panel D, we control for the effect of religious diversity measured by a fractionalization index, using information on the religious denomination of the EVS respondents in each region. Value differences across individuals might partially align with differences in their religious denomination and this correlation might affect our previous estimates. Yet, as the results show, the inclusion of religious diversity as a control does not affect our results regarding value diversity. In fact, religious diversity is not significantly

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<sup>11</sup>We should note here that the correlation between ethnic diversity and all of our dimensions of value diversity within countries is effectively zero. It is only across countries that we find a weak positive correlation between ethnic and value diversity.

Table 4. Controlling for alternative notions of diversity

	Cultural dimension																
	Trust			Work norms			Gender norms			Market views			Democratic values			Average	
	Resid. (1)	Emig. (2)	Resid. (3)	Emig. (4)	Resid. (5)	Emig. (6)	Resid. (7)	Emig. (8)	Resid. (9)	Emig. (10)	Resid. (11)	Emig. (12)					
<b>Panel A</b>																	
Value diversity	-0.039*** [0.010]	-0.038* [0.018]	-0.041*** [0.012]	-0.033*** [0.009]	-0.034*** [0.011]	-0.022** [0.010]	-0.036*** [0.012]	-0.025* [0.013]	-0.038*** [0.008]	-0.028* [0.016]	-0.053*** [0.014]	-0.029* [0.015]					
Income Gini	0.001 [0.013]	-0.013 [0.017]	-0.016 [0.017]	-0.019 [0.018]	-0.003 [0.012]	-0.017 [0.017]	0.007 [0.011]	-0.016 [0.016]	-0.008 [0.018]	-0.017 [0.016]	0.000 [0.019]	-0.015 [0.016]					
<b>Panel B</b>																	
Value diversity	-0.036** [0.013]	-0.037* [0.019]	-0.041*** [0.014]	-0.034*** [0.009]	-0.034*** [0.011]	-0.024** [0.010]	-0.033** [0.013]	-0.028* [0.015]	-0.038*** [0.008]	-0.030* [0.017]	-0.050*** [0.014]	-0.031* [0.016]					
Education Gini	0.011 [0.028]	-0.020 [0.036]	-0.017 [0.036]	-0.023 [0.038]	-0.007 [0.031]	-0.020 [0.037]	0.011 [0.025]	-0.023 [0.037]	0.003 [0.036]	-0.022 [0.036]	0.013 [0.033]	-0.026 [0.037]					
<b>Panel C</b>																	
Value diversity	-0.033*** [0.011]	-0.037* [0.020]	-0.042*** [0.013]	-0.035*** [0.010]	-0.032** [0.012]	-0.024* [0.012]	-0.031** [0.011]	-0.028* [0.015]	-0.037*** [0.007]	-0.028 [0.016]	-0.048*** [0.011]	-0.030* [0.017]					
Ethnic diversity	-0.015 [0.012]	-0.017 [0.013]	-0.012 [0.013]	-0.020* [0.011]	-0.016 [0.013]	-0.018 [0.012]	-0.011 [0.012]	-0.020 [0.013]	-0.014 [0.013]	-0.015 [0.013]	-0.005 [0.013]	-0.017 [0.014]					
<b>Panel D</b>																	
Value diversity	-0.036*** [0.011]	-0.038* [0.020]	-0.044*** [0.013]	-0.035*** [0.011]	-0.035*** [0.012]	-0.024** [0.012]	-0.033** [0.012]	-0.027* [0.015]	-0.038*** [0.007]	-0.029* [0.017]	-0.050*** [0.011]	-0.031* [0.017]					
Religious diversity	0.017 [0.013]	-0.003 [0.015]	0.005 [0.014]	-0.005 [0.015]	0.006 [0.015]	-0.003 [0.016]	0.006 [0.012]	-0.002 [0.015]	0.006 [0.015]	-0.004 [0.016]	0.011 [0.013]	-0.003 [0.016]					

Notes: The dependent variable is log GDP per capita. We show results for EVS samples of residents (Resid.) and emigrants (Emig.). All regressions include country fixed effects and control for population density, market potential, average years of schooling, the share of the agricultural sector, and the mean value orientation score. Independent variables are standardized to have a zero mean and a unit standard deviation. Robust standard errors clustered at the country level are shown in brackets. \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ .

related to regional GDP per capita differences. In results not reported in the table, we also tested for the role of religion by including the regional shares of the four main religious denominations present in Europe, Protestantism, Catholicism, Orthodox Christianity, and Islam, but this did not affect our results either.

### *Additional Robustness Considerations*

The results reported so far should make us confident that our finding of a negative association between value diversity and regional economic development is robust to different ways of measuring value diversity and to controlling for alternative dimensions of diversity. In the Online Appendix, we further explore whether other factors potentially influencing both regional economic development and value diversity might be driving our results. Specifically, we consider the role of interregional spillover effects in economic development, correct for the age composition of the population and the nature of the emigration flows, control for the urban character and the geographic characteristics of regions, and allow for path-dependency in regional economic development. In all cases, we find that the inclusion of these additional controls does not alter our previously obtained results. The details are provided in Section 4 of the Online Appendix, with Table A4-4 reporting the results.

## **VI. Exploring the Underlying Mechanism**

Our finding of a strong negative relation between value diversity and economic development extends previous work on the harmful effects of diversity along genetic, ethnic, and linguistic lines (Easterly and Levine, 1997; Alesina *et al.*, 2003; Ashraf and Galor, 2013).<sup>12</sup> To understand better the nature of this negative relationship, in this section, we explore various mechanisms through which value diversity might adversely affect economic development. One potential mechanism relates to the quality of regional institutions, as suggested by La Porta *et al.* (1999), and the political organization of local societies, highlighted by Dalgaard and Olsson (2013). An alternative mechanism might be associated with the provision of public goods. Specifically, as suggested by Lindqvist and Ostling (2010),

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<sup>12</sup> Ashraf and Galor actually find the relationship between diversity and development to be hump-shaped. Yet, their focus is on genetic diversity that fosters creativity and innovation apart from increasing tensions across individuals and leading to coordination problems. However, these beneficial effects of diversity are unlikely to apply to our notion of diversity that is in terms of values. Thus, our measure of value diversity is bound to reflect only the negative effects of diversity suggested by Ashraf and Galor.

Desmet *et al.* (2012), and Alesina *et al.* (2016), diversity triggers disagreements about government priorities and these disagreements might lead to an inefficient provision of public goods.

In Table 5, we present a series of regressions to explore the relevance of these mechanisms. We first relate our measure of value diversity to an index of regional quality of governance developed recently by Eurostat (Charron *et al.*, 2015). We also relate it to a series of indicators of public goods provision suggested by Desmet *et al.* (2012), capturing the quality of transportation infrastructure, schooling, and health care. Specifically, transportation infrastructure is measured with the kilometers of motorways and railways per 1,000 residents, schooling availability is proxied by the school enrollment rate of 17 year olds, and health care quality is measured by the number of hospital beds per 100,000 residents and the infant mortality rate.<sup>13</sup>

To conserve space, we report only results based on the average value diversity and mean value orientation scores across the five cultural dimensions, noting that the results for each of the five dimensions are similar and in line with the results for their average. As in the previous sections, we measure value diversity and mean value orientation based on the responses of each region's residents and emigrants and we standardize both variables to have a zero mean and a unit standard deviation. In this case, we also standardized the different dependent variables, so that the estimated effects of value diversity on each of them can be directly compared. The regressions further include country fixed effects, so that the attention falls on the within-country variation in institutional quality, public goods provision, and value diversity.

Columns 1 and 2 of Table 5 document the results for the effect of value diversity on institutional quality. In line with the hypothesis of La Porta *et al.* (1999), we find a negative association between value diversity and regional institutional quality, which is more evident when we measure value diversity based on values expressed by the emigrants of a region. Columns 3–6 show the results for transportation infrastructure, which imply that higher value diversity is associated with lower density of motorways and railroad networks. Columns 7 and 8 indicate a similar negative relationship for the provision of schooling. Finally, Columns 9–12 document a significant negative relationship between value diversity and the availability and quality of health care. Regions characterized by high value diversity have fewer hospital beds per person and higher rates of infant mortality. All of these results are in line with prior work regarding the adverse effect of

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<sup>13</sup>We should note here that for France, Germany, and the UK, some of these variables are available only at the NUTS-1 level, which leads to a smaller sample size in some of the regressions.



Table 5. *Effects of value diversity on institutions and public good provision*

	Dependent variable											
	Institutional quality		Motorways p.c.		Railways p.c.		17-year-olds' sch. enr. rate		Hospital beds per 1,000		Infant mortality rate	
	Resid.	Emig.	Resid.	Emig.	Resid.	Emig.	Resid.	Emig.	Resid.	Emig.	Resid.	Emig.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Value diversity	-0.001	-0.090***	-0.090	-0.082**	-0.132*	-0.097*	-0.088*	-0.200***	0.053	-0.068**	0.017	0.095***
(Average of five dimensions)	[0.023]	[0.026]	[0.062]	[0.033]	[0.063]	[0.049]	[0.045]	[0.058]	[0.039]	[0.028]	[0.035]	[0.027]
Mean value orientation	0.107	-0.003	-0.112	0.037	-0.093	0.020	0.176	0.119	0.073	0.020	-0.142*	-0.023
(Average of five dimensions)	[0.103]	[0.035]	[0.067]	[0.052]	[0.096]	[0.062]	[0.106]	[0.078]	[0.077]	[0.045]	[0.077]	[0.050]
Countries	19	19	18	18	17	17	20	20	20	20	21	21
Observations	161	161	222	222	172	172	185	185	189	189	244	244
Within R <sup>2</sup>	0.02	0.04	0.04	0.05	0.15	0.14	0.02	0.07	0.00	0.09	0.6	0.68

Notes: We show results for EVS samples of residents (Resid.) and emigrants (Emig.). All independent variables are standardized to have a zero mean and a unit standard deviation. All regressions include country fixed effects. Robust standard errors clustered at the country level are shown in brackets. \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ .

diversity, but are established for the first time for diversity measured in terms of values. Thus, they underscore two important channels through which diversity in values within societies can adversely affect economic performance.

## **VII. Conclusions**

The existing body of literature on cultural economics has suggested that certain cultural values are conducive to economic development. In the context of this body of literature, the focus has typically been on analyzing the effect of variation in the prevalence of such values across countries and regions. Our analysis goes beyond this approach by exploring how the degree of sharedness of these values across individuals influences regional economic development. We do so by exploiting the regional variation in value prevalence and value diversity across different dimensions of culture within EU countries and using information on the values expressed by emigrants of each region to avoid the potential feedback effect that economic development might have on values.

Using this approach, we provide evidence that diversity in cultural values is robustly negatively related to income per capita levels, and this relationship is both sizeable and statistically significant. Irrespective of whether we focus on value diversity in terms of trust, work norms, gender norms, pro-market attitudes, or views regarding democracy, the results indicate a negative association between value diversity and regional economic development. This negative effect of value diversity comes in addition to the positive impact that the prevalence of particular values, such as trust, can have on regional economic development, as previously documented by Beugelsdijk and van Schaik (2005) and Tabellini (2010). Through a series of robustness tests, we further highlight that the results do not hinge on the econometric set-up or the exact way in which we measure diversity, and do not change when considering the role of alternative dimensions of diversity and other factors that might influence the relationship between value diversity and economic development.

The strong and robust negative result for value diversity uncovered in this paper suggests an additional channel through which culture influences economic development. Beyond the overall value orientation of a given society, the degree of sharedness of these values across individuals matters as well. Hence, our analysis suggests that the relationship between the cultural background of a society and its level of economic development is more complex than acknowledged so far. A complete analysis of the interaction between culture and the economy should not be limited to an

analysis of the prevalence of a selected set of cultural values, but it should also consider the extent to which such values are shared.

Our results also have implications for the rich body of literature on diversity and economic development. In this context, our finding regarding the adverse role played by value diversity complements similar conclusions that previous studies have reached regarding other dimensions of societal diversity such as ethnic, linguistic, religious, and genetic diversity (Alesina *et al.*, 2003; Fearon, 2003; Michalopoulos, 2012; Ashraf and Galor, 2013). Moreover, as our analysis demonstrates, the adverse role of value diversity that we have uncovered is independent of the effects that other dimensions of societal diversity might have at the regional level in terms of productivity and utility, such as those discussed by Ottaviano and Peri (2006) and Ager and Brueckner (2013). This suggests that different notions of diversity might have different implications for economic development and the most relevant one, in a given context, might not necessarily be the most visible one.

## Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

### Online Appendix

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