Economics Letters 165 (2018) 48–53

Contents lists available at ScienceDirect

Economics Letters

journal homepage: www.elsevier.com/locate/ecolet

Dyadic value distance: Determinants and consequences

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HIGHLIGHTS

- We develop a new measure of bilateral differences in values.
- Our data is based on 857 questions from the World Values Survey and covers 90 countries.
- Both geography and ancestral distance are shown to affect bilateral value differences.
- Our measure of value distance helps understand differences in current income levels.

ARTICLE INFO

Article history:
Received 23 October 2017
Received in revised form 11 January 2018
Accepted 17 January 2018
Available online 2 February 2018

JEL classification:
J11
O33
O47
Z13

Keywords:
Dyadic value distance
Economic development
Genetic distance

ABSTRACT

This paper establishes a measure of bilateral differences in values using 857 questions from the World Values Survey. We explore the determinants of value distance, linking it to geography as well as the historical relatedness of populations across 90 countries. Furthermore, we assess the explanatory power of value differences for economic development and find a close association between bilateral value distances and differences in GDP per capita.

1. Introduction

The recent literature in economics has provided mounting evidence that culture matters for economic outcomes (Guiso et al., 2006; Alesina and Giuliano, 2015). While earlier research emphasized the role of cultural variables for economic outcomes within a country (Alesina and Giuliano, 2010; Eugster et al., 2011), a more recent literature has put forward the impact of *bilateral* cultural differences between countries as a determinant of several economic outcomes, including technology diffusion (Spolaore and Wacziarg, 2009), fertility choice (Spolaore and Wacziarg, 2016b), conflict (Spolaore and Wacziarg, 2016c), and trade (Fensore et al., 2017). An important channel through which cultural differences affect economic and social relationships is the degree to which values differ between two populations.

This paper intents to examine this effect by using the World Values Survey (WVS) to establish the dyadic value distance (DVD) as a measure of bilateral differences in values.[1] We demonstrate that DVD is closely associated with geographic distance as well as with genetic distance, a commonly used measure for the historical relatedness of populations across the globe. In addition, we apply our measure of value distance to a specific research question and test how much of the variation in current income levels can be accounted for by differences in values. The estimates document a close association between cross-country differences in value distance and differences in income.

Our work is related to prior studies finding evidence that differences in values can have direct and indirect effects on economic development (Harutyunyan and Özak, 2017). For the direct effects, Dohmen et al. (2016) find that patience matters for the accumulation of physical and human capital. The indirect (or barrier) effect is supported by Spolaore and Wacziarg (2009)

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[1] The data set on dyadic value distance is available from the authors.

https://doi.org/10.1016/j.econlet.2018.01.022
0165-1765/

who argue that genetic distance – which captures differences in values, norms, and habits – has affected the historical spread of technology. We complement this evidence by documenting that various dimensions of value differences help explain the variation in GDP per capita across countries, most prominently a society's openness to new ideas and immigration, the attitude towards freedom versus equality, as well as work ethics. This contributes to Becker et al. (2017) who show that specific values, such as risk aversion, altruism, reciprocity, and trust, are related to a population's ancestry. More broadly, our work adds to the literature on the importance of values and norms for a variety of social and economic outcomes, including smoking behavior, educational choices, and political preferences (Alesina and Giuliano, 2014; Galor and Özak, 2016).

2. Data

The data set that we use in this study is based on three sources: the World Values Survey (WVS), information on bilateral genetic distance, and numerous country-specific and bilateral variables. The latter two sources are relevant for the analysis of determinants and consequences of value differences. To measure differences in values, we use the longitudinal data set of the nationally representative surveys from the World Values Survey Association (2015). This data set includes answers from all six waves that were conducted between 1981 and 2014. It covers 95 countries, although not all countries were included in each wave. Our analysis is based on a total of 857 questions. In addition, we provide value differences in 19 categories that we will describe later.[2]

We complement our data set with data on genetic distances from Spolaore and Wacziarg (2017) who argue that genetic distance is a measure of ancestral distance that captures a multitude of characteristics including differences in habits, customs, beliefs, norms, and conventions. One can consider genetic distance as a summary statistic for intergenerationally transmitted traits across populations. The study by Spolaore and Wacziarg (2016a) confirms this intuition by showing that although measures of cultural distance are poorly correlated to another, genetic distance is positively correlated to all of them. The data on genetic distance provided by Spolaore and Wacziarg (2017) is based on 267 populations defined by Pemberton et al. (2013) as well as ethnic compositions compiled by Alesina et al. (2003). While all people in the world share the same gene variants (alleles), the frequencies differ across populations. When populations split apart, genes start to change due to random drift or natural selection. Assuming drifts are constant, measured genetic distance can be thought of as a molecular clock. In other words, genetic distance provides us with an approximate time since the populations of two countries were the same population.

Finally, we enrich our data set with detailed economic and geographic information at the country-level. This includes data on GDP and population size for each country. As primary source, we use the Penn World Table 9.0 (PWT), for which we take into account the most recent update by Feenstra et al. (2015).[3] We also add geographic information to our data set from CEPII (Mayer and Zignago, 2011). This comprises both information for each country as well as bilateral variables. The former includes each country's location in terms of latitude and longitude, island status, as well as a dummy for being landlocked. The bilateral variables provide information on contiguity as well as access to the same sea. Overall, we have 90 countries in our data set. Hence, there are $(90\times 89)/2 = 4005$ bilateral observations.[4]

3. Dyadic value distance

Drawing on answers to the World Values Survey (WVS), we develop a measure of bilateral value distance. We build upon Desmet et al. (2011) as well as Spolaore and Wacziarg (2016a) and compute the average Manhattan distance in answers of the World Value Survey between countries.[5] Hence, we measure the distance for two countries i and j for a given question x by

$$w_{i,j,x} = \sum_{s=1}^{q} |x_i^s - x_j^s| \tag{1}$$

where x^s is the share of people choosing answer option s to question x, such that $\sum_{s=1}^{q} x_i^s = 1$ when q denotes the number of possible answers. Using this metric, we take into account the structure of each question. To obtain a dyadic measure of differences in values, we aggregate the measure in Eq. (1) over all N questions in the WVS to get

$$w_{i,j} = \frac{1}{N} \sum_{x=1}^{N} w_{i,j,x} \tag{2}$$

as the average absolute distance in values. When exploring the effect of ancestry on technology diffusion, Spolaore and Wacziarg (2017) argue that the *relative* genetic distance to the technological frontier, the United States, rather than the bilateral distance affects technological differences. Therefore, we compute the relative distance in values to the United States between two countries as

$$r_{i,j,x} = |w_{i,US,x} - w_{j,US,x}| \tag{3}$$

for each question x. Again, we can aggregate to have an overall measure of value distance for each country pair to obtain

$$r_{i,j} = \frac{1}{N} \sum_{x=1}^{N} r_{i,j,x} \tag{4}$$

which denotes the relative value distance to the United States between countries i and j. The proposed measure avoids that the direct bilateral and the relative distances coincide, except for some special cases such as for questions with binary answer options and where x_{US}^1 is larger or smaller than both x_i^1 and x_j^1. In this case, $w_{i,j,x}$ and $r_{i,j,x}$ are the same.

The simple dyadic value distances, $w_{i,j}$, appear to follow closely a normal distribution as documented in Fig. 1. The largest distance is between El Salvador and Sweden with a value of 0.210, the smallest is between Belarus and Ukraine with a value of 0.038. To illustrate dyadic value distances for a single country, let us consider the United States for which we depict the bilateral distance to each country in Figure A.1 in the Appendix. The data shows that in terms of values, the United States is closest to Canada (distance of 0.054) and Australia (0.060), while Morocco (0.149) and Egypt (0.151) are most distant. The map in Figure A.1 in the Appendix

[2] In the Appendix, we provide an overview of the country coverage for each wave in Table A.1. Furthermore, Table A.2 provides detailed information on which questions we use for each category. We also indicate the coverage of the survey for each question.

[3] Note that the PWT database does not cover Lybia. Thus, we use the World Development Indicators as secondary data source to predict the missing GDP. This procedure insures that the GDP (per capita) values are comparable even if they stem from different sources.

[4] We provide descriptive statistics on the data set as well as raw correlations between measures of genetic and value distance in Table A.3 in the Appendix. Note that data on genetic distance is missing for Andorra, Puerto Rico, Tanzania, Yemen, as well as former Yugoslavia.

[5] The measure by Desmet et al. (2011) is similar in its calculation but limited to 430 questions from four WVS waves. The value differences computed by Spolaore and Wacziarg (2016a) are based on 74 countries and 98 questions from both the WVS and the European Values Study. Comparing their variables with ours, we find a correlation of 0.67–0.89 for the relative and simple value distance, respectively.