**2017 Update to Longitudinal Cross-National Distance Data**

On this website, we provide excel spreadsheets with cross-national and longitudinal data for nine distance dimensions (including administrative, cultural, demographic, economic, financial, global connectedness, knowledge, political and geographic distance) that are described in our paper Berry, Guillen and Zhou (2010), “An Institutional Approach to Cross National Distance. Each of our nine distance dimensions has its own Excel file and each spreadsheet contains one year of country-dyad distance calculations. We use the WDI country codes as country identifiers.

Our distance dimensions are only as good as the underlying raw data that were used to create them. Where there is missing data across countries and time in the source data, we also suffer from the same missing data points. In addition, there is one distance dimension where we interpolated between two data points to create yearly data – our cultural distance dimension. Appendix 1 (below) describes the items we used in the World Values Surveys to approximate Hofstede’s (1980) four cultural dimensions.

We downloaded all data from the sources listed in Tables 2 and 3 in Berry et al. (2010), reproduced and updated below. We calculated our distance dimensions incorporating all of the variables for each individual dimension listed in Tables 2 and 3. In Appendix 2 (below), we explain how the Mahalanobis calculations we did to create these distance measures differ from the more common Euclidean distance calculations.

Some changes that we had to make to be able to do the 2017 updating include the following:

1.) We have made substantial changes to the political distance dimension. In previous versions, we captured dyadic membership in regional trade agreements using separate (and numerous) variables as inputs into the distance calculation. As regional trade agreements have increased, this has caused issues in the covariance matrix that have magnified over time. In the 2017 update, we have replaced the regional trade agreement variables with two unique variables to replace these dyadic variables: FDI to GDP ratio, and the number of bilateral trade agreements a country has. In the very early years of the data, the old political distance and new political distance dimension are somewhat correlated, but in later years, when there are far more regional trade agreements, they are less correlated. The previous political distance dimension calculations (including up to 2016) are available upon request.

2). The Economic Distance data uses the WDI data that was posted in June, 2017. At this time, the GDP per capita (income) measure used a base year of 2010 (instead of the 2000 that was used in our original economic distance data and 2005 that was used in the 2014 update). In addition, the newer version of the WDI raw data uses the inflation rate instead of the GDP deflator.

 3.) We have also had to make some changes to the Financial Distance calculations, due to changes in the raw data on which this measure is based. More specifically, the WDI has changed its source for stock market data, meaning that where we previously had coverage of 99 countries in our last year of the spreadsheets (in 2012), we now only have 49 countries in our last year (of 2016) in the 2017 updated data. (We are happy to send anyone the old data for researchers looking to use a wider set of countries until 2012 upon request.) The following is the explanation from WDI for the decrease in country coverage: *Stock market data were previously sourced from Standard & Poor's until they discontinued their "Global Stock Markets Factbook" and database in April 2013. Time series have been replaced in December 2015 with data from the World Federation of Exchanges and may differ from the previous S&P definitions and methodology*

4.) Since 2014, the World Values Surveys no longer includes data from the European Values Survey (though it did in 2010). Our updated Cultural Distance data includes data items from what is currently available in the World Values Survey and the European Values Surveys for all years. Some of these changes to the underlying raw data mean that the updated data may not be similar to older versions of the data. Please keep this in mind if you are trying to download new years of data only. The cultural distance data is interpolated in between survey years. The last survey year for each country is the last year the country appears in the data. For example, the United States did their survey for the 2010-2014 WVS wave in 2011, and therefore data can only be interpolated until 2011. The last year of surveys in the last wave is 2014, but this only includes 8 countries (and 2013 only includes 17 countries), and therefore the culture data is only included up to 2012.

5.) Since doing our 2014 update, we have removed the common language dimension of the administrative distance. Our source data for language is the CIA Factbook and this source is inconsistent in how it reports languages across countries (meaning, sometimes it lists languages and a percentage break-down across those languages, while other times it lists languages with no percentage break-down). Given these inconsistencies, we decided to drop the language component of our Administrative Distance dimension. (Our posted data is highly correlated with what we used in our JIBS publication.)

6.) For the knowledge distance measure, there was a revision to the WDI measure of Scientific Articles in 2016 and this has resulted in a series break in the data, which now only cover the 2000 – 2013 time period. This raw data is only collected by WDI intermittently and interpolated. So, we went to the source of this new data, Thompson Reuters Incites database, which publishes this data yearly. We downloaded this for the longer time period covering 1980 to 2016. The specific categories we collected data for are Physics, Biology & Biochemistry, Chemistry, Mathematics, Clinical Medicine, Engineering, Space Science, Immunology, Microbiology, Materials Science, Molecular Biology & Genetics, Geosciences, Environment/Ecology, consistent with the data collection description in the WDI.

As with the original database, we offer two versions for each of our nine dimensions, including Mahalanobis Pooled and Mahalanobis Year:

* To create the Mahalanobis Pooled, we used a pooled covariance matrix to create all distance dimensions in these excel sheets. This means that data from all years were used to calculate the covariance matrix.
* To create the Mahalanobis Year, we only used data from the current year to calculate the covariance matrices for these distance dimensions.

When considering which of these versions to use, you should consider the other data you have. If you have panel data for your other variables, our Mahalanobis pooled data takes into account scale and correlation across variables over time. If you have cross sectional data, then you may want to use the distance dimensions that use separate matrices for each year.

Please remember that in using the data posted on this website you agree to cite our paper as the source in all publications, whether printed, digital or otherwise, and in any genre (including papers, reviews, notes, powerpoint presentations, etc.). Please note that we are not responsible for any errors or omissions and would appreciate hearing any issues you find in the data.

Suggested citation:

Berry, H., Guillen, M and Zhou, N. 2010. An Institutional Approach to Cross-National Distance, *Journal of International Business Studies* 41(9): 1460-1480.

**Table 2: Indicator Component Variables Used in the Calculation of Distance Dimensions (for 2017)**

**Dimension: Component Variables:**

1. Economic Distance

 Income GDP per capita, 2010 USD

 Inflation GDP deflator (% GDP)

 Exports Exports of goods and services (% GDP)

 Imports Imports of goods and services (% GDP)

2. Financial Distance

 Private Credit Domestic credit to private sector (% GDP)

Stock Market Cap Market capitalization of listed companies (% GDP)

Listed Companies Number of listed companies (per one million population)

3. Political Distance

 Policy Making Uncertainty Political stability measured by considering independent

institutional actors with veto power

Size of the state General government final consumption expenditure (% of GDP)

 WTO member Membership in WTO (GATT before 1993)

 Bilateral Trade Agreements Number of Bilateral Trade Agreements

 FDI to GDP Foreign direct investment, net inflows (% of GDP)

4. Administrative Distance

 Colonizer-colonized link Whether dyad shares a colonial tie

 Common religion % population that share the same religion in the dyad

 Legal system Whether dyad shares the same legal system

5. Cultural Distance

 Power distance WVS question on obedience and respect

 for authority

 Uncertainty avoidance WVS questions on trusting people

 Individualism WVS questions on independence and the

role of government in providing for its citizens

 Masculinity WVS questions on the importance of

 family and work

6. Demographic Distance

 Life expectancy Life expectancy at birth, total (years)

 Birth rate Birth rate, crude (per 1,000 people)

Population under 14 Population ages 0-14 (% of total)

 Population under 65 Population ages 65 and above (% of total)

7. Knowledge Distance

 Patents Number of patents per one million population

 Scientific Articles Number of scientific articles per one million population

8. Global Connectedness Distance

 International Tourism Expend International tourism, expenditures (% GDP)

 International Tourism Receipts International tourism, receipts (% GDP)

 Internet use Internet users per 1,000 people

9. Geographic Distance

 Great circle distance Great circle distance between two countries according to

 the coordinates of the geographic center of the countries

**Table 3: Distance Dimensions, Sources, Year Availability, and Country Coverage**

**Dimension: Source Years Available # of Countries (in last year)**

1. Economic Distance

 Income WDI 1961-2016 180

 Inflation WDI 1961-2016 180

 Exports WDI 1961-2016 151

 Imports WDI 1961-2016 151

2. Financial Distance

 Private credit WDI 1960-2016 171

Stock market Cap WDI 1988-2016 59

Listed companies WDI 1988-2016 77

3. Political Distance

 Policymaking uncertainty POLCONV 1960-2016 164

 Size of the state WDI 1960-2016 146

 World trade agreements WTO 1960-2016 129 Bilateral trade agreements WTO 1960-2016 129

 FDI to GDP WDI 1970-2016 129

4. Administrative Distance

 Colonizer-colonized Link CIA Factbook constant 198

 Common religion CIA Factbook constant 198

 Legal system La Porta et al. constant 198

5. Cultural Distance

 Power distance WVS 1990-2012 35

 Uncertainty avoidance WVS 1990-2012 35

 Individualism WVS 1990-2012 35

 Masculinity WVS 1990-2012 35

6. Demographic Distance

 Life expectancy WDI 1960-2015 200

 Birth rate WDI 1960-2015 204

 Population under 14 WDI 1960-2016 196

Population under 65 WDI 1960-2016 196

7. Knowledge Distance

 Patents USPTO 1975-2015 173

 Scientific articles Thompson Reuters InCites 1980-2016 144

8. Global Connectedness Distance

 International tourism Expend WDI 1995-2015 153

 International tourism Receipts WDI 1995-2015 153

Internet users WDI 1995-2015 204

9. Geographic Distance

 Great circle distance CIA Factbook constant 196

 Common border CIA Factbook constant 226

**Appendix 1: World Values Survey Questions Used in the Calculation of Cultural Distance**

In order to replicate Hofstede’s (1980) cultural scores with time-varying measures, we used the World Values Survey (Inglehart, 2004). We downloaded data from five waves of the WVS conducted between 1980 and 2014 for as many as 69 countries. However, not all of our questions were available in the early waves of the surveys and we have focused on those surveys with sufficient data on all questions in what we have posted. Effectively, this means that we have data from 1990-2014, interpolating the years in between individual surveys. We used mean response scores by country as the input data for all calculations.

To measure Hofstede’s power distance, we computed the percentage of respondents who chose “obedience” in response to question a042: “Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five.” The other categories were leadership, self-control, thrift saving money and things, determination perseverance, religious faith, unselfishness, and loyalty. We also took into account the percentage of people who responded to question e018 that “it would be a good thing”: “I'm going to read out a list of various changes in our way of life that might take place in the near future. Please tell me for each one, if it were to happen, whether you think it would be a good thing, a bad thing, or don't you mind? —Greater respect for authority.”

To measure uncertainty avoidance we computed the percentage of people answering “very careful” to question a165: “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”

To measure individualism we computed the percentage of people who chose “independence” in response to question a029: “Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five.” The other categories were good manners, politeness and neatness, hard work, honesty, feeling of responsibility, patience, and imagination. We also took into account the response to question e037: “Now I'd like you to tell me your views on various issues. How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between: —The government should take more responsibility to ensure that everyone is provided for. —People should take more responsibility to provide for themselves.”

Finally, to measure masculinity we computed the mean response on a scale from 1 to 5 to the question: “For each of the following, indicate how important it is in your life: —a001 family, and —a005 work.

**Appendix 2: Calculation of Euclidean and Mahalanobis Distances**

**Euclidean Distance**

 Suppose that for a specific country in any given year we observe $x\_{i}$ for $i=1...p$, where $x\_{i}$ is a characteristic of the specified dimension (e.g. for the economic dimension $x\_{1}$=imports, $x\_{2}$=GDP per capita etc).  Let $\overbar{x}\_{i}$ be the arithmetic mean of characteristic $i$ across all countries in any given year.  Let $σ\_{x\_{i}}$ be the sample standard deviation of characteristic $i$ across all countries in any given year.  We first standardized each dimension:

$z\_{i}$ = $\frac{\left(x\_{i} - \overbar{x}\_{i}\right)}{σ\_{x\_{i}}}  $ for each country in the given year.

Then the Euclidean distance between two countries A and B is calculated as

$$d\left(A,B\right)=\sqrt{\sum\_{i=0}^{p}(z\_{i}\left(A\right)- z\_{i}(B))^{2}}$$

where $z\_{i}(A)$ and $z\_{i}(B)$ are the values of the standardized characteristic $i$ corresponding to countries A and B respectively.

**Mahalanobis Distance**

Suppose that for two countries in any given year, we observe two vectors $a=(a\_{1},a\_{2},…,a\_{p})$ and **b**$ =\left(b\_{1},b\_{2},…, b\_{p}\right)$ of p different characteristics. Similarly, suppose there is an *n*-by-*p* matrix $M$with p columns representing characteristics, and n rows containing each country in each year (so the number of rows would be the summation over all years of the number of countries in each year). We define $C$, a covariance matrix for $M$,as a *p*-by-*p* matrix with element $C\_{ij}$ equal to the sample covariance of columns *i* and *j* in the matrix $M$. Finally, let **I**$I$be the *p*-by-*p* identity matrix. Then the squared Mahalanobis distance between two countries is calculated as:

$$d\left(a,b\right)^{2}=\left(a-b\right)C^{-1}\left(a-b\right)^{T}$$

We can alternatively rewrite the Euclidean distance above as:

$$d\left(a,b\right)=\sqrt{\left(a-b\right)I\left(a-b\right)^{T}}$$

**References**

Berry, H., Guillen, M and Zhou, N. 2010. An Institutional Approach to Cross-National Distance, *Journal of International Business Studies* 41(9): 1460-1480.

Hofstede, G. 1980. *Culture's Consequences: International Differences in Work-related Values*. Beverly Hills, CA: Sage.

Inglehart, R. 2004. *Human beliefs and values*. Madrid: Siglo XXI.