

Overcoming the “E-Word”?
Instrumental Variables Analysis and the Role of National Culture in Corporate Finance

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Abstract

The ability to mitigate econometric problems arising from endogenous explanatory variables is critical to overcoming the concerns of spurious correlation that may afflict studies vulnerable to omitted correlated variables bias or reverse causality. While instrumental variables analysis may be used to address these types of endogeneity issues, a more pressing empirical challenge may involve the selection of appropriate instruments. In this paper, we identify the instruments used in the “culture and finance” literature, describe how to convincingly justify the use of the instruments, and document where to locate the data to form the actual instruments. Overall, we design this study to help future authors weigh the “pros” and “cons” of using specific instruments and to better inform empirical strategies for addressing endogeneity concerns.

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How many empirical research projects are now littering the electronic graveyard or are now languishing in working paper purgatory, felled by endogeneity concerns? As recognized by Angrist et al. (1996) and Bound et al. (1995), the threat of endogeneity muddies the already frequently murky waters through which the empiricist must wade and complicates efforts to identify causal effects, rather than mere correlations, between variables. From Altonji et al. (2005, p.152), we know that, “Distinguishing between correlation and causality is the most difficult challenge faced by empirical researchers in the social sciences”. Repeating a warning that is not unfamiliar to many researchers, Reiss and Wolak (2003) caution authors to gird for the frequent criticism from referees and seminar participants calling into question the validity of regression results because of endogeneity concerns.

To provide an example of empirical analyses vulnerable to this type of endogeneity criticism, we consider studies of the relation between national culture and economic outcomes (or the “culture and finance” literature). As in many empirical settings, these studies may be plagued by the correlated omitted variables problem. Specifically, the findings of these papers may be affected by an omitted variable that is correlated with measures of national culture and with the economic outcome being studied. To mitigate concerns about omitted variables and more clearly demonstrate causality, Ahern et al. (2015), Eun et al. (2015), Licht et al. (2007), Guiso et al. (2006), and many other of the “culture and finance” papers utilize instrumental variables (IV) analysis and employ exogenous instruments that represent inherited, slow-moving components of culture. Overall, these authors identify a rich set of exogenous instruments for use in instrumental variables analysis.

The purpose of this paper is to review those instruments, to offer guidance to future authors regarding the economic justification for the use of specific instruments, and to provide resources regarding the sources of data to form the respective instrumental variables. More specifically, our survey is designed to allow authors to evaluate the “pros” and “cons” of recently-used empirical instruments. When appraising these potential instruments, we consider factors such as validity (i.e., what are the statistical properties of an appropriate instrument), plausibility (i.e., how widely has the particular instrument been used and/or is it considered acceptable by economists), and availability (i.e., are the required data readily accessible).

This paper is important because, as exemplified by several studies in a recent (Spring 2016) issue of this journal (e.g., El Ghouli et al. (2016), Ucar (2016)), the finance literature has been increasingly considering differences in national culture as potential sources of variation in cross-national decision-making.¹ There appears to be much more that can be learned. That is, while there is a growing body of “culture and finance” research, Karolyi (2015, p.15) notes that, relative to other business disciplines, finance has been slow to embrace the potential explanatory power provided by a rigorous consideration of the impact of national culture and concludes that “there is much potential yet for national culture to help us understand cross-border activities of firms and investors.” However, this “culture and finance” research, like many empirical endeavors in financial economics, is subject to endogeneity concerns, most frequently involving issues of causality and correlated omitted variables. The ability to fulfill the research potential prophesized by Karolyi (2015) requires that these issues of endogeneity be addressed. Our survey is designed to help future researchers tackle these empirical challenges and tap into this potential explanatory

¹ Many examples from the relatively young, but expanding, body of literature on “culture and finance” are provided in our references. See also recent special issues devoted to “culture and finance” by the *Journal of Financial Economics* and the *Journal of Corporate Finance*.

value that can be provided by a more thorough analysis of the effect of national culture on financial decision-making.

This paper is also important because we focus on providing theoretical and empirical justification for the selection of potential instrumental variables. If IV analysis is used to forge a causal chain between national culture and economic outcomes, the weakest link may be the economic justification for the selection of the instrumental variables. Specifically, Larcker and Rusticus (2010) evaluate a 10-year sample of top accounting journals and find that 80% of the studies using IV analysis provide no discussion regarding the choice of instruments. Further contributing insight for authors seeking to appropriately and convincingly designate an instrumental variable, Reiss and Wolak (2003) specify that the choice of an instrument should be supported by economic theory and caution that lack of economic justification should “sound a warning bell” regarding the variable’s selection. Accordingly, we seek to help future authors overcome this methodological weakness by not only identifying potential instruments but by also carefully attempting to articulate economic support for the use of each variable.

Additionally, we complement this presentation of the theoretical justification for the potential instruments with the more utilitarian contribution of providing detailed sources of data for each variable. While we should select potential instruments based primarily on economic and econometric rationales, data availability is another factor to consider. Therefore, in our subsequent discussion and in the tables at the end of this paper, we provide numerous source citations (which frequently include the specific page numbers or table references) to access the particular data. Whenever possible, we also include website references for electronic retrieval of the described data. Overall, we design this paper to help guide empiricists to innovative data and avoid having to “reinvent wheels”.

More broadly, we hope that this paper contributes beyond the realm of the “culture and finance” literature and offers useful insights to any empirical researcher challenged with issues involving endogeneity. As an author, we may benefit from a framework for addressing endogeneity and from thoroughly considering an in-depth implementation of instrumental variables analysis. As a referee, a deeper understanding of the process of selecting instruments and conducting IV analysis may help in providing more valuable comments during the review process. As an instructor, we hope that this type of study, by demonstrating the pragmatic application of formulating specific instruments, may be a valuable supplement to research methodology classes.

We organize the remainder of this paper as follows. Section I identifies primary measures of national culture. In studies of the impact of national culture on economic outcomes, these measures of national culture represent the potentially endogenous variables for which instrumental variables analysis is designed to control. Section II briefly describes the endogeneity problem. In section III, we recognize potential strategies to mitigate concerns of endogeneity (including the use of instrumental variables analysis). Focusing on instrumental variables analysis, section IV outlines the characteristics of desirable instruments. In section V, we identify potential instrumental variables and provide economic justification for each potential instrument. We array these exogenous instruments into the following classifications: genetic, religious, linguistic, behavioral, demographic, geographic, historical, and economic. Section VI provides a summary and conclusion.

I. Measuring National Culture

The field of cross-cultural psychology has specified numerous paradigms for documenting international cultural differences. The most widely-used metrics are from Hofstede, Schwartz, the

World Values Survey, and Project GLOBE. These quantifiable measures of societal traits allow for the formulation of testable hypotheses regarding culture's impact on economic decision-making. Below is a brief introduction to each framework. See the on-line appendix for further detail.

I.A. Hofstede

As summarized by Sondergaard (1994), one of the most widely-utilized and empirically-validated typologies of national culture was developed by Geert Hofstede (1980). Hofstede (1980) defines culture as the “software of the mind”. Hofstede uses values as a means to operationalize his dimensions of cultural variation (known as cultural value dimensions or CVD). Hofstede (1980) concludes that cultures address four primary paradigms: 1) the relationships between the individual and the group, 2) the inequitable distribution of power, 3) the social implications of gender, and 4) the ability to tolerate uncertainty.² Hofstede argues that each of his cultural value dimensions provide a bi-polar spectrum of possible responses as a means of coping with each of the four major issues.

I.B. Schwartz

Like Hofstede, Schwartz (2006) developed a framework of cultural value dimensions that focus on values. Schwartz (2006) defines values as conceptions of the desirable that guide social actions and specify appropriate behavior. He contends that a society's perspective regarding values provides the most relevant representation of its culture. Since values vary in importance across societies, Schwartz is able to construct unique cultural profiles for each country. He bases the cultural profiles on the relative significance that a society ascribes to each of three bi-polar

² Subsequent to his seminal 1980 study, Hofstede added a fifth value dimension to his cultural taxonomy. This fifth measure, Long-Term Orientation (versus Short-Term Orientation), considered whether a society focuses more on future goals or attaches more emphasis to living in the present (and honoring the past).

“value dimensions”. Schwartz derives these value dimensions from three fundamental issues faced by every society.³ His three value-dimensions (and the polar orientations of each) are: Embeddedness/Autonomy, Hierarchy/Egalitarianism, and Mastery/Harmony.

I.C. World Values Survey Variable: Trust

While the Hofstede and (to a lesser extent) Schwartz variables have dominated the empirical literature examining the consequences of culture, the World Values Survey (WVS) provides an alternative methodology for assessing cultural attributes. To measure the cultural dimension of trust, Ahern et al. (2015), Aghion et al. (2010), Guiso et al. (2003, 2006, 2009), and many others rely on responses to various waves of questionnaires that comprise the World Values Survey and draw from the WVS item focusing on generalized level of trust. The generalized-trust question of the WVS provides the input for the most ubiquitous assessment of trust. That question reads: “Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?” These specific data are from World Values Survey, Wave 6, item V24.⁴

I.D. Project GLOBE

The Global Leadership and Organizational Behavior Effectiveness (GLOBE) project provides an additional analysis of cultural dimensions. Relative to Hofstede, GLOBE’s variables include the similarly named measures of Power Distance and Uncertainty Avoidance. Like Hofstede, GLOBE also measures a society’s level of Individualism/Collectivism but does so with two variables: Institutional Collectivism and In-Group Collectivism. GLOBE replaces Hofstede’s Masculinity metric with the analogous measures of Assertiveness and Gender Egalitarianism.

³ In this regard (i.e., a focus on fundamental problems faced by all societies), the approach of Schwartz is similar to that of Hofstede.

⁴ Aghion et al. (2010) further leverage the rich WVS data by also considering responses to questions regarding the trust of government (WVS item V118) and the trust of companies (WVS item V120).

GLOBE's measure labelled Future Orientation is conceptually similar to Hofstede's Long-Term Orientation. Finally, GLOBE includes the two unique cultural dimensions of Performance Orientation and Humane Orientation.

Since the purpose of our paper is to identify and evaluate the use of instrumental variables in studies measuring the effects of national culture, it is important to recognize the contribution of project GLOBE. Nevertheless, given the importance and promise of the GLOBE project, we seek to identify opportunities where findings regarding the use of IV methodologies for the more widely-used cultural variables (such as those of Hofstede) may transitively apply to the potential use of GLOBE measures. Accordingly, we focus on the GLOBE variables that appear most directly correlated with the Hofstede variables.⁵

In studies of the impact of national culture on economic outcomes, these measures of national culture represent the potentially endogenous variables for which instrumental variables analysis is designed to control. We next briefly review the endogeneity problem.

II. Endogeneity – Defining the problem

Succinctly defining endogeneity, Wooldrige (2002, p.50) specifies that “a variable is endogenous if correlated with the error term”. Within the context of modeling the economic impact of national culture, the most likely manifestation of the endogeneity problem is omitted correlated variables bias. Larcker and Rusticus (2010) and Bound et al. (1995) note that this issue

⁵ From our review of the extant literature (described further in the on-line appendix), it appears that the GLOBE measures of Power Distance, Institutional Collectivism, and Assertiveness are most similar to those of Hofstede. Accordingly, for these GLOBE metrics (Power Distance, Institutional Collectivism, and Assertiveness), we feel that our findings regarding the instruments relevant for the corresponding measures from Hofstede will equally apply when considering these specific GLOBE measures.

arises when a variable that influences both the explanatory factors and the outcome under study is omitted from the regression.⁶

Endogeneity (such as caused by the omitted correlated variables problem or reverse causality) results in OLS estimates that are biased and inconsistent (Bound et al., 1995). This complicates, if not invalidates, the ability to establish causality. As such, since the possibility of unobserved, omitted variables raises the specter of spurious correlation, researchers must employ additional econometric techniques to overcome this potential bias.

III. Endogeneity – Addressing the problem

To address this endogeneity issue, the standard textbook approach is to use instrumental variables analysis.⁷ Instrumental variables analysis appears especially well-suited for studying the economic impact of national culture since IV is most typically utilized to identify causal effects in models with endogenous explanatory variables (Conley et al., 2012). This identification of causal effects is critical to fulfilling the requirements outlined by Guiso et al. (2006) for establishing a connection between national culture and economic outcomes. Specifically, in a pioneering paper, Guiso et al. (2006) establish a path for connecting culture to economic outcomes. First, we must identify a relation between culture and beliefs and preferences. Next, those beliefs and preferences must have economic consequences. Finally, we must demonstrate a causal link from culture to economic outcomes. Regarding the last step, the extant literature has provided evidence of a causal link by instrumenting beliefs and preferences by their cultural determinants. This research

⁶ Reverse causation is another econometric issue that is often classified under the heading of endogeneity. However, when discussing potential vulnerabilities to endogeneity concerns, Eun et al. (2015) echo the perspective from a majority of papers examining the effect of national culture and conclude that reverse causation “seems implausible” since cultural values were established well before recent economic events. This conjecture is supported by a preponderance of scholarship documenting that culture is an extremely slow-moving institution, which according to Williamson (2000) changes only “on the order of centuries or millennia”. Within the specific context of considering how national culture affects recent economic outcomes, Griffin et al. (2013) and Li et al. (2013) note the diminished likelihood of reverse causation given the stability of national culture.

⁷ For example, see p. 300 of Greene’s standard textbook (Greene, 1990).

generally seeks to establish a causal link between culture and economic outcomes through an instrumental variables approach, where beliefs and preferences are “instrumented” by using foundational determinants of culture. Therefore, following Guiso et al. (2006), we agree that performing instrumental variables analysis is appropriate to further confirm a causal impact of national culture.

IV. Using instrumental variables analysis: Characteristics of valid instruments

From Angrist et al. (1996, p.444), we know that instrumental variables are “variables that are explicitly excluded from some equations and included in others, and therefore correlated with some outcomes only through their effect on other variables”. Hamermesh (2000, pp.370-371) notes that a critical step in the IV approach is “finding clever instruments”, that are correlated with the endogenous factor but are not correlated with the error term. However, identifying such “clever instruments” is difficult.⁸ We next describe some of the challenges that empiricists face when searching for valid instrumental variables.

IV.A. Exogeneity

First, overcoming endogeneity requires exogeneity. Larcker and Rusticus (2010), Guiso et al. (2006), Acemoglu et al. (2001), and Hamermesh (2000) recognize that an instrument must provide a plausibly exogenous source of variation in the endogenous regressor and must be correlated with the endogenous factor but not correlated with the disturbance term in the structural equation. Therefore, the first important characteristic of an instrument is that it passes the litmus test of exogeneity.⁹

⁸ Coles et al. (2012) and Himmelberg et al. (1999) further note the difficulties involved in identifying valid instruments.

⁹ When describing the search for such instruments, Hamermesh (2000) argues that the most incontrovertible claims for exogeneity relate to “acts of God”, to factors extraneous to the economy being studied, or to events that are clearly beyond the decision-maker’s control.

IV.B. Correlation with endogenous regressor

Bound et al. (1995) note additional problems that may undermine the use of instrumental variables analysis. Consistent with Hippocrates (400 BC?) and the famous oath bearing his name, the empiricist's choice of an instrument should "first do no harm". Specifically, Bound et al. (1995) warn that selecting instruments that are only weakly correlated with the endogenous variable may produce results that are inferior to those obtained from the initial OLS specifications. As such, Bound et al. (1995) identify that models predicated on instruments that explain little of the variation in the endogenous regressor may return IV estimates having greater inconsistency than OLS estimates. Therefore, a valid instrument should also be strongly correlated with the endogenous regressor.

IV.C. Exclusion restriction

Third, an instrument should satisfy the exclusion restriction. That is, Acemoglu et al. (2001) note that an instrument should be highly correlated with the endogenous variable but have no direct impact on the outcome under study (other than through the effect on the endogenous factor). This exclusion restriction is violated (and the instrument is invalid) if the outcome variable is affected by additional factors that are also correlated with the instrument. To provide assurance that the exclusion restriction is not threatened, Acemoglu et al. (2001) suggest including control variables in the IV estimations and conducting tests of over-identification. Regarding the former, Acemoglu et al. (2001) recommend systematically adding control variables (that may be plausibly correlated with both the instrument and the outcome) and identifying whether the IV estimates change substantially following the inclusion of each incremental factor. Regarding the latter, Acemoglu et al. (2001) note that over-identification tests directly assess the model's accordance

with the exclusion restriction by considering whether the instrument affects the outcome through another variable.

IV.D. Justification of specific instruments

Citing frustration regarding the process of selecting instruments used in recent IV analyses, Larcker and Rusticus (2010, p.187) write, “In general, the variables selected seem largely arbitrary and are not justified by any rigorous theoretical discussion.”¹⁰ Larcker and Rusticus (2010) review the recent use of instrumental variables analysis in top accounting journals and find that almost 80% of these studies present no rationale for the selected instruments. As part of a framework to guide the application of IV methodology, Larcker and Rusticus (2010, p.191) conclude that “researchers need to carefully justify their instrumental variables using economic theory” and must “make a compelling theoretical or practical argument” regarding the plausibility of each instrument.

As we document throughout the remainder of this paper, efforts to identify “clever instruments” may involve a comprehensive search into areas outside the normal domain and comfort zone of the financial economist. Such a panoptic approach may be required to demonstrate the economic rigor necessary to slay the endogeneity dragon. Specifically, Larcker and Rusticus (2010) propose that a convincing IV analysis should include supplemental sensitivity analysis that ascertains whether the use of different instruments leads to very different results. Larcker and Rusticus (2010) warn that, if the outcomes from using different instruments are not consistent, then the exogeneity of some or all of the instruments should be questioned. Accordingly, since identifying multiple instruments seems optimal, we recommend that the quest for instruments be

¹⁰ Similarly, Kennedy (1985, p.115) notes that, very often in empirical research, “the choice of an instrumental variable is highly arbitrary.”

as inclusive as possible. The following pages provide an example of such a multi-faceted, multi-discipline search.

V. The Search for Potential Instrumental Variables

As we review the instruments used in the extant literature, we focus on the economic justification for the selection of each variable. Since the remainder of our paper is devoted to considering how instruments for national culture may be chosen, we have the luxury to more extensively consider the theoretical justification for the use of particular instruments. We also have the opportunity to more thoroughly weigh the practical applications of these variables (i.e., the “pros” and “cons” of specific instruments based on data availability and other empirical considerations).

V.A. Genetic Factors as Potential Instrumental Variables

When seeking to determine the most effective instruments, we examine the foundational factors that should underlie national culture. To do so, we follow Guiso et al. (2006) and recognize that culture is driven by the transmission of beliefs and values from generation to generation. Perhaps the most direct means of transmission of any characteristic is heredity. Gorodnichenko and Roland (2011a, 2011b, 2015) argue that genetic data provide valid instrumental variables required to convincingly demonstrate that culture has a causal effect on economic outcomes.

Spolaore and Wacziarg (2009) note that genetic analysis focuses on the allele (i.e., the particular form taken by a gene). Differences in allele frequencies provide metrics for assessing distance between populations. To quantify genetic heterogeneity, Ahern et al. (2015), Eun et al. (2015), and Gorodnichenko and Roland (2011a, 2011b, 2015) use a fixation index (F_{st} distance) developed initially by Cavalli-Sforza et al. (1994). The F_{st} index takes on higher values for larger genetic distance (based on differences in 120 alleles). Specifically, the F_{st} index estimates the

genetic difference between two countries and represents the expected genetic distance between two individuals randomly selected from each nation.

Using genetic distance as an instrument for Individualism, Ahern et al. (2015), Eun et al. (2015), and Gorodnichenko and Roland (2011a, 2011b, 2015) follow the “frontier” method as outlined by Spolaore and Wacziarg (2009). The “frontier” is the country with an outlier value of a particular characteristic. For example, in studies of the effect of Individualism, the U.S. serves as the “frontier” since the U.S. scores highest on Hofstede’s Individualism index. Therefore, when considering the relation between national culture and income, Gorodnichenko and Roland (2011a, 2011b, 2015) use genetic data as an instrument for Individualism by considering genetic distance relative to the U.S. Specifically, using the U.S. as the “frontier” (given its highest individualism score), Gorodnichenko and Roland (2011a, 2011b, 2015) form an instrument for Individualism by calculating the genetic distance between the population of a given country and the U.S. population. The primary measure of genetic distance from Gorodnichenko and Roland (2011a, 2011b, 2015) is based on frequencies of blood types. For the cross-country data regarding “blood distance” used by Gorodnichenko and Roland (2015) as an instrument for Individualism, see Figure 5, p.43 of Gorodnichenko and Roland (2015). Cross-country data providing measures of genetic distances are available at <http://sites.tufts.edu/enricospolaore/research/>.

Charting an additional path towards identifying other possible instruments for national culture, Kuhnen et al. (2013), Barnea et al. (2010), and Cesarini et al. (2009) document that inherited predispositions regarding the regulation of neurotransmitters (such as serotonin and dopamine) provide a key physiological linkage between genetics and the development of cultural attributes.

For example, Chiao and Blizinsky (2010) and Way and Lieberman (2010) argue that genetic variation in neurotransmitters, by calibrating sensitivity to social stress, may influence the degree of Collectivism or Individualism within a particular society. Supporting this contention, Chiao and Blizinsky (2010), Way and Lieberman (2010), and Caspi et al. (2003) find that collectivistic cultures are more likely in countries where more people carry the short allele of the 5-HTTLPR gene (a serotonin transporter). Populations with this genetic variant exhibit greater vulnerability to depression following social rejection. Way and Lieberman (2010) conclude that the benefits of a collectivistic culture (e.g., the support from being embedded in a closely-knit and highly stable social network) are greatest for those most genetically-susceptible to social stress. Following this theory and empirical evidence, Gorodnichenko and Roland (2011a, 2011b, 2015) use the country-level prevalence of this genetic characteristic (i.e., short allele of the 5-HTTLPR gene) as an instrument for Individualism/Collectivism. Cross-country data are available at <http://rspb.royalsocietypublishing.org/content/277/1681/529.figures-only>.

Genetic predispositions regarding this serotonin transporter (5-HTTLPR gene) may also affect a society's levels of Uncertainty Avoidance. Specifically, Kuhnen et al. (2013), Chiao and Blizinsky (2010), Way and Lieberman (2010), Kuhnen and Chiao (2009), Stein et al. (2007), Munafo et al. (2009), and Sen et al. (2004) note that carriers of the short allele of the 5-HTTLPR gene register greater harm avoidance and manifest heightened anxiety in uncertain situations. Accordingly, national-level data regarding frequencies of this genetic characteristic may also serve as an instrument for Hofstede's measure of Uncertainty Avoidance (UAI).

Gorodnichenko and Roland (2011b) and Way and Lieberman (2010) further document how genetic predispositions impacting neurological activity are likely to influence cultural formation. Noting that a functional polymorphism in the u-opioid receptor (i.e., the rampancy of the G-allele

in the A1186 gene) regulates sensitivity to social alienation, Gorodnichenko and Roland (2011b) and Way and Lieberman (2010) identify that the prevalence of this genetic trait (i.e., G-allele) appears more frequently in Collectivist cultures. As such, Gorodnichenko and Roland (2011b) use the prevalence of the G-allele in the A1186 gene as an instrument for Hofstede's measure of Individualism/Collectivism. Cross-country data regarding the prevalence of the G-allele are available from Way and Lieberman (2010). In Way and Lieberman (2010), see Figure 1, p.206.

Highlighting a similar genetic influence based on the physiological regulation of dopamine, Dreber et al. (2009), Chen et al. (1999), Castro et al. (1997), and Benjamin et al. (1996) identify a genetic predisposition towards risk-taking (which thus may also be correlated with the Schwartz cultural dimension of Embeddedness/Autonomy).¹¹ These authors find that variants of the DRD4 gene (which influences the dopaminergic pathways in the brain) are empirically linked to heightened novelty-seeking and risk-taking behaviors. The prevalence of this exogenous genetic variation (specifically, the presence of the 7-repeat allele (7+) in the DRD4 gene) may serve as an instrument for a nation's measure on the Schwartz spectrum of Embeddedness/Autonomy. Cross-country data for the DRD4 gene are available from Chen et al. (1999). For these data, see Table 2, pp.314-315 of Chen et al. (1999).

Genetically-determined physiological factors may also impact the cultural dimension of trust. First, since DeBruine (2002) notes that people who look alike tend to trust each other, somatic differences may affect levels of trust. Accordingly, Ahern et al. (2015) and Guiso et al. (2009) use differences in anthropometric measures (such as height, hair color, and dimensions of the head) as instruments for trust. Cross-country data for somatic differences are available at: <http://www.kellogg.northwestern.edu/faculty/sapienza/htm/research/htm>.

¹¹ El Ghoul et al. (2016) and Chui et al. (2002) document a strong negative correlation between Embeddedness and risk-taking.

V.B. Religious Factors as Potential Instrumental Variables

Guiso et al. (2006) also report that religion is an underlying factor in the formation and transmission of beliefs and values. Stulz and Williamson (2003) consider religion as an antecedent of culture and demonstrate that religion has significant explanatory power in understanding cross-sectional variation in legal systems. Following this research suggesting that religion is an underlying determinant of differences in societal values, we recognize that religious factors may serve as instruments for national culture.¹²

We first focus on the relation between religion and Uncertainty Avoidance. Hofstede (1983) observes that cultures scoring high on Uncertainty Avoidance feel greater stress from ambiguity and seek to minimize indeterminate outcomes. He further contends that, particularly in societies characterized by high levels of Uncertainty Avoidance, religion may serve as a coping mechanism by helping to make uncertainty more tolerable.¹³ Hofstede (1983) argues that cultures high in Uncertainty Avoidance establish institutions providing order and predictability and gravitate towards religions that are more rigidly structured and are more likely to claim absolute truth. Such religions reduce ambiguity (which is especially important to people highly stressed by uncertainty). Furthermore, while Hofstede (1983) recognizes that all religions provide answers to the unanswerable, some religions profess answers that are more explicit and more definitive than others. LaPorta et al. (1997b) note that hierarchical religions (such as Catholicism) emphasize strict, vertical bonds of authority that may help to instill the order and structure favored in a culture ranking high in Uncertainty Avoidance. Therefore, societies that are more threatened by

¹² Furthermore, as noted by Guiso et al. (2006) and Stulz and Williamson (2003), religion is modified only gradually and with difficulty and is a generally slow-moving institution. As such, using religion as an exogenous instrument for culture should further reduce the risk of reverse causality.

¹³ Iannaccone (1998), Hull and Bold (1989), and Jensen (1979) also identify a potential relation between religion and a society's tolerance of uncertainty. These authors argue that many standard elements of religious institutions were developed to reduce uncertainty.

uncertainty (high Uncertainty Avoidance) should be more inclined to seek protection behind a fortification of strict rules and rigid institutions (such as hierarchical religions).

Griffin et al. (2013), Li et al. (2013), Kwok and Tadesse (2006) and Guiso et al. (2003; 2006) use religion as an instrument for a culture's tolerance for uncertainty (Uncertainty Avoidance). The expectation is that countries with more hierarchical religions are generally characterized by greater Uncertainty Avoidance. LaPorta et al (1999) and LaPorta et al. (1997b) specify that Catholic, Greek Orthodox, and Muslim religions are considered the most hierarchical. Accordingly, the proportion of each country's respondents to the World Values Survey who indicated that they were Catholic, Greek Orthodox, or Muslim may serve as an exogenous instrument for Uncertainty Avoidance.

Cross-country data for religious affiliations are available from Guiso et al. (2009), Guiso et al. (2003), Barrett et al. (2001), and LaPorta et al. (1999). For data from Barrett et al. (2001), see <http://worldreligiondatabase.org/>.¹⁴ Guiso et al. (2009) and Guiso et al (2003) use data from the World Values Survey (WVS). The wave 6 of the WVS poses the specific inquiry about religious affiliation in item V144. For detailed responses to this question (and all other WVS questions), see <http://www.worldvaluessurvey.org>. Also, data regarding religious affiliations are provided in Table 1, Panel B, pp.236-237 of Guiso et al. (2003).

Noting that religion is strongly associated with other aspects of national culture, Griffin et al. (2013) and Li et al. (2013) use religion as an instrument for Individualism. Regarding specific relations, Griffin et al. (2013) find that Protestant countries rank higher on Hofstede's Individualism metric. This correlation is broadly consistent with the analysis of Greif (1994) which notes that the theology of Christianity focused on the individual, rather than the social group.

¹⁴ This resource is particularly valuable since it also provides historical data (e.g., religious affiliations as of 1900). Using historical data as instruments may further reduce concerns about reverse-causation.

As such, since a Christian society should preordain a more Individualistic (less Collectivist) culture, measures of religious affiliation may additionally be used as instruments for a society's degree of Individualism.

V.C. Linguistic Factors as Potential Instrumental Variables

We also focus on language as an underlying factor affecting national culture and thus a source for instrumental variables. As summarized by Kashima and Kashima (1998), the social sciences emphasize the interconnection between language and culture. For example, based on the pioneering work of Sapir (1970) and Whorf (1956), the Linguistic Relativity hypothesis holds that language and culture are commingled such that “language determines or at least influences the way we look at our world”.

The linguistics literature further identifies how particular grammatical rules can offer insights regarding the speaker's culture. For example, Kashima and Kashima (1998) contend that a language's use of person-indexing pronouns (i.e., personal deixis) reflects a culture's conception of the prominence of the individual. Kashima and Kashima (1998) argue that a language's rules regarding the potential omission of subject-indexing pronouns (also known as “pronoun drop”) reflect a culture's perspective on the relation between the individual and the group. Languages requiring person-indexing pronouns (such as “I” in English) place greater emphasis on the subject by explicitly distinguishing the speaker from the general context. Conversely, other languages license the omission of the subject pronoun. These “pronoun drop” languages remove the spotlight from the speaker and instead convey a more entrenched portrayal of the speaker as cast within the broader social backdrop. Overall, Kashima and Kashima (1998) conclude that a language's rules regarding “pronoun drop” reflect whether a culture places more focus on the uniqueness of the speaker (i.e., the individual) or on the significance of the wider social context (i.e., the group). As

such, “pronoun drop” should be related to a culture’s degree of individualism versus collectivism. In recent empirical studies, Gorodnichenko and Roland (2011a, 2011b, 2015) use “pronoun drop” as an instrument for Individualism. Cross-country data for “pronoun drop” are available from Licht et al. (2007) and Kashima and Kashima (1998). In Kashima and Kashima (1998), see that paper’s Appendix A, pp. 479-481. In Licht et al. (2007), see its Appendix A.3., pp. 684-685.

Providing a rich and multi-faceted perspective on culture, the linguistic research regarding personal deixis (or use of person-indexing pronouns) also suggests a relation between pronoun use and Uncertainty Avoidance. Specifically, Kashima and Kashima (1998) find that nations speaking languages that require multiple second-person pronouns score significantly higher on Hofstede’s Uncertainty Avoidance index. These languages stipulate that the speaker must choose the form of the second-person pronoun as specified by social status and/or familiarity with the addressee.¹⁵ Kashima and Kashima (1998) propose that this linguistic obligation to continuously monitor the discourse and choose the acceptable second-person pronoun burdens the speaker with “decisional stress”. This “decisional stress” may contribute to a higher level of concern with ambiguity (i.e., a higher level of Uncertainty Avoidance). Kashima and Kashima (1998) find a strong relation between Uncertainty Avoidance and the prevalence of multiple second-person pronoun languages. Accordingly, as suggested in the empirical analysis of Breuer and Salzmann (2012), an additional instrument for Uncertainty Avoidance may be based on whether a majority of a country’s population speaks a language with multiple second-person pronouns. For cross-country data indicating whether a language requires multiple second-person pronouns, see Appendix A (pp. 479-481) of Kashima and Kashima (1998).

¹⁵ English is not a multiple second-person pronoun language; English only allows the use of the second-person pronoun “you” regardless of status or social difference between the speakers.

Guiso et al. (2009) further support the connection between language and culture by identifying that a common language is one of the most significant determinants of trust between nations. Rodrik (2000) notes that linguistic differences may lead to social conflicts (which should contribute to a less trusting society). As such, measures of linguistic differences may serve as instruments for levels of trust. The linguistics literature provides means of measuring language differences both within a country and between specific pairs of countries. Within a country, the Ethnolinguistic Fractionalization statistic (Alesina and LaFerrara (2005) and Alesina et al. (1999)) reflects the probability that two randomly selected citizens of a country primarily speak different languages. Between pairs of countries, differences in languages can be gauged by identifying “linguistic common roots” or the number of shared branches by two languages on a language tree (Guiso et al. (2009) and Fearon and Laitin (2003)). For cross-country data regarding Ethnolinguistic Fractionalization, see Alesina et al. (1999), LaPorta et al. (1999), and Easterly and Levine (1997). Cross-country data for assessing linguistic differences between pairs of countries are available from the Ethnologue website (www.ethnologue.com). Desmet et al. (2009) describe a similar measure of linguistic distance between languages. The Desmet et al. data are available at <http://ielex.mpi.nl>.

Also, Siegel et al. (2013) and Siegel et al. (2011) identify a negative relation between linguistic heterogeneity (i.e., Ethnolinguistic Fractionalization) and level of Egalitarianism.¹⁶ Therefore, since linguistic diversity may be an exogenous factor affecting a society’s level of Egalitarianism, characteristics of language (such as Ethnolinguistic Fractionalization) may also provide an instrument for the Schwartz measure of Egalitarianism/Hierarchy.

¹⁶ Siegel et al. (2013) and Siegel et al. (2011) attribute this correlation to the theory of Alesina and LaFerrara (2005) that a more fragmented society is less altruistic.

V.D. Behavioral Factors as Potential Instrumental Variables

Data from the behaviors of a nation's citizens may offer insights regarding a nation's culture, and thus may be another broad source for potential instrumental variables. Employing a framework somewhat analogous to that of the Revealed Preference theory of Samuelson (1938), we follow Licht et al. (2001) and look to actual decisions in real life situations. We contend that these observed behaviors (choices), if affected by the cultural environment of the decision-maker, may serve as instrumental variables for cultural value dimensions.

Providing an example as to how researchers may form instruments for national culture from observations of actual behavior within a society, Fisman and Miguel (2007) present data for an additional instrument for Hierarchy/Egalitarianism by examining the incidence of unpaid parking tickets by diplomats in New York. In an intriguing study, they identify a high correlation between the amount of corruption in a nation's government and the number of parking violations by its diplomats. The propensity of a nation's diplomats to commit parking violations may serve as an instrument for Hierarchy/Egalitarianism since Siegel et al. (2013), Licht et al. (2007), and Licht et al. (2001) find that nations with cultures reflecting lower degrees of Egalitarianism (higher degrees of Hierarchy) are more accepting of the exploitation of power for personal advantage.¹⁷ Fisman and Miguel (2007) present cross-country data for diplomatic parking violations in the study's Table 1 (pp. 1027-1032).

Using behavioral data to assess a nation's level of Individualism (vs. Collectivism), Gupta et al. (2004) suggest that researchers may consider the prevalence of team sports within a country.

¹⁷ In light of the strong correlation between the Hierarchy/Egalitarianism metric from Schwartz and the PDI from Hofstede, we also recognize that the Fisman and Miguel (2007) data (parking violations by a nation's diplomats) may serve as instrument for PDI. Specifically, exploitation of power for personal gain should be more likely in a country that is more tolerant of the unequal distribution of authority. Furthermore, in a high Power Distance (PDI) society, the use of power to extort personal gains would be accepted (Hofstede (1980)); in a low PDI society, a similar extraction of private benefits would be detested (Khatri et al. (2006)).

Specifically, since the members of a more Collectivistic society may be more inclined to participate in team sports, the relative popularity of team sports (versus individual sports) may serve as an instrument for Individualism/Collectivism. For cross-country data to potentially use as an instrument, see <http://biggestglobalsports.com>.

Providing support for another possible instrument for Individualism/Collectivism (also based on behavioral data), Talhelm et al. (2014) and Lester (1995) report a lower incidence of divorce in nations with more Collectivist cultures. Such a correlation would be consistent with the Hofstede (1980) contention that Collectivist societies strongly emphasize the preservation of relationships. Therefore, a nation's divorce rate may be an instrument for the nation's degree of Individualism/Collectivism. Cross-country data providing divorce statistics are available at http://www.un.org/esa/population/publications/WMD2008/WP_WMD_2008/Data.html.

V.E. Demographic Factors as Potential Instrumental Variables

Recognizing the importance of demography as an underlying determinant of national culture, Becker (1996, p.16) notes that people “cannot alter their ethnicity, race or family history”. Since it is exogenous and invariant, an individual's ethnicity may serve as an instrument for cultural predispositions.

Rodrik (2000) provides an overarching perspective of the impact of demographic diversity on cultural formation by noting that ethnic differences frequently presage social conflict and contribute to uncertainty in a country. Highlighting a relation between ethnicity and uncertainty, Kwok and Tadesse (2006) consider demography as an exogenous component of national culture and use ethnic heterogeneity as an instrumental variable for Hofstede's Uncertainty Avoidance Index (UAI).¹⁸ The specific instrument of Kwok and Tadesse (2006) is the degree of ethnic

¹⁸ Hofstede (2001) also identifies demography as a key determinant of differences in the toleration of uncertainty.

heterogeneity in a country (from Easterly and Levine (1997)). Griffin et al. (2013) also consider ethnic diversity as a potential instrumental variable for Hofstede's UAI. Following many other authors, Griffin et al. (2013) use the ethnic fractionalization data of Alesina et al. (2003). These data provide a multi-faceted framework for analyzing societal fractionalization based on differences in ethnicity, language, and religion. These data are available in the appendix of the Alesina et al. paper (Table A.1., pp.184-189).

A slow-moving, inherited determinant of national culture, ethnicity may also affect a society's degree of Individualism (versus Collectivism). Highlighting a relation between collectivistic behavior and ethnicity, Licht et al. (2007) determine that ethnic fractionalization magnifies the importance of in-group affiliation (which contributes to a greater proclivity towards a more Collectivist culture). Guiso et al. (2006) present evidence that demographic characteristics affect whether a society is likely to develop a more individualistic or a more collectivist predisposition towards wealth redistribution by governments. Furthermore, Griffin et al. (2013) recognize that demographic diversity may affect the society's level of Individualism. Accordingly, this research suggests that the nation's degree of ethnic fractionalization may be a potential instrumental variable for Individualism/Collectivism.

Siegel et al. (2013) and Licht et al. (2007) report that a society's degree of ethnic fractionalization also affects its level of Egalitarianism. The finding that greater societal fractionalization is associated with lower Egalitarianism is consistent with Alesina and LaFerrara (2005) who conclude that people in highly fractionalized societies are less altruistic and are less supportive of populist endeavors. Additionally, Coffee (2001) contends that members of societies characterized by broad ethnic divisions are generally more predatory and opportunistic (which again suggests an inverse relation between ethnic fractionalization and Egalitarianism). Since this

theoretical and empirical evidence substantiates a strong correlation, we contend that ethnic fractionalization may serve as a potential instrument for the Schwartz cultural value dimension of Egalitarianism.

Cross-country data for ethnic fractionalization (an instrumental variable also used by Mauro (1995)) are from Desmet et al. (2009), Easterly and Levine (1997), and Taylor and Hudson (1972). Data from Mauro (1995) are available from that paper's Appendix 3, pp.708-710 or at <http://doi.org/10.3886/ICPSR05029.V2>. The Desmet et al. (2009) data are available from that paper's Appendix B, Table B.1., pp.1313-1317 or from the author's website at <http://faculty.smu.edu/kdesmet>. Data from Easterly and Levine (1997) are available at <http://go.worldbank.org/K7WYOA8T0>.¹⁹

V.F. Geographic Factors as Potential Instrumental Variables

"Geography is as exogenous a determinant as an economist can ever hope to get". This quote from Rodrik et al. (2004; p. 133) suggests that geographic characteristics may be valuable in our search for instrumental variables that isolate the exogenous component of cultural value dimensions.

By affecting the type of influence by European colonizers, geography may have predisposed the formation of culture in many countries. Acemoglu and Johnson (2005) and Acemoglu et al. (2001, 2002) recognize significant differences in the quality of institutions developed in colonies where a large number of Europeans actually established permanent residence ("Settlement" colonies) as opposed to colonies that the Europeans did not primarily inhabit but instead utilized as providers of resources to remove and export ("Extractive" colonies).

¹⁹ Please note, that while the two metrics are correlated, there are differences between ethnic fractionalization and ethnolinguistic fractionalization (as described in Section V.C.).

Acemoglu and Johnson (2005) and Acemoglu et al. (2001, 2002) hold that Europeans were inclined to form “Settlement” colonies in geographically hospitable environments.²⁰ First, Europeans were more likely to settle in places where they were less likely to die. The “germs” theory of development (Acemoglu et al. (2001)) contends that Europeans established “extractive” colonies in areas of higher settler mortality. In such inhospitable regions, the colonial powers were more likely to impose absolutist institutions (creating and perpetuating social inequalities). Therefore, the historical rate of settler mortality, an exogenous factor affecting the colonizer’s choice of forming “settlement” or “extractive” colonies, may be a potential instrument when considering the effect of institutional differences, generally, and the differences in PDI, specifically. Glaeser et al. (2004) and Acemoglu et al. (2001) use historical settler mortality as an instrumental variable for institutional quality and measure settler mortality as the logarithm of annual deaths per thousand European colonizers during the early 19th Century in 72 former colonies. Cross-country data recording settler mortality are available from Acemoglu et al. (2001). See Table A2 of the Appendix of Acemoglu et al. (2001; p.1398).

Second, climate is another exogenous factor that may help distinguish “extractive” and “settlement” colonies. Easterly and Levine (2003), Hall and Jones (1999), and LaPorta et al. (1999) argue that Europeans were more likely to settle in geographies with familiar climates. Hall and Jones (1999), contending that Europeans were more likely to establish “settlement” colonies in climates similar to Europe, use distance from the equator as an instrument for Western influence on the former colony’s development of social infrastructure. Accordingly, we follow Hall and Jones (1999) and consider latitude as an exogenous instrument for national culture (especially as

²⁰ Gelfand et al. (2011) and Sachs (2000) note the relation between ecological threats (e.g., extreme weather conditions, prevalence of disease) and societal dynamics (e.g., development of formal institutions and national culture).

an instrument for Hofstede's PDI). Cross-country data for latitudes are available from Hall and Jones (1999) and Tobler et al. (1995).²¹

Third, Acemoglu et al. (2014), Glaeser et al. (2004), and Hall and Jones (1999) note that Europeans were more likely to establish "settlement" colonies in regions with low indigenous populations. Acemoglu et al. (2014) partially explain this pattern (i.e., "settlement" colonies if low initial population density) by arguing that the operation of "extractive" colonies required substantial labor (which would not be possible without a large indigenous population). Drawing from this theory and evidence, Griffin et al. (2013) use a region's population density as of 1500 (the approximate beginning of the period of European colonization) as an exogenous instrument for national culture.²² Cross-country data for population density as of 1500 are provided by Acemoglu et al. (2002) and McEvedy and Jones (1978). The detailed data from Acemoglu et al. (2002) are available at <http://economics.mit.edu/faculty/acemoglu/data/hcapital>.

Providing another geographically-inspired view on cultural development, Fincher et al. (2008), Park et al. (2007), Faulkner et al. (2004), and Sagiv and Schwartz (1995) present evidence that social phenomena (e.g., national culture) may provide an anti-pathogen defense mechanism.²³ That is, in a society more at risk for contagious disease, cultural attributes may evolve to mitigate exposure to new pathogens. To use the Hofstede nomenclature, a more collectivistic (less individualistic) society may limit contagion risk due to a more ethnocentric focus on the in-group and a more xenophobic predisposition regarding outsiders. Accordingly, Fincher et al. (2008) argue that, in regions that were historically more exposed to pathogens, highly collectivistic

²¹ For the latitude data from Tobler et al. (1995), see <http://www.ciesen.org/gpw/globaldem.html>. For the latitude data from Hall and Jones (1999), see <http://web.stanford.edu/~chadj>.

²² Acemoglu et al. (2001, 2002, 2014) and Hall and Jones (1999) also use a region's population density as of 1500 as an exogenous instrument.

²³ This is consistent with the conjecture of Rodrik et al. (2004) that geography is a key determinant of disease burden.

societies emerged as a result of a form of self-imposed quarantine. Conversely, more individualistic cultures were likely to evolve in societies less exposed to pathogens. Offering evidence that cultural attributes may provide an anti-pathogen function, Fincher et al. (2008) find a strong negative relation between Individualism and the historical prevalence of pathogens. Based on this theory and empirical evidence, Gorodnichenko and Roland (2011a, 2011b, 2015) use historical pathogen prevalence as an exogenous instrument for Individualism.

Cross-country data regarding pathogen prevalence (both historical and recent) are available from Fincher et al. (2008).²⁴ Specifically, see the supplemental materials from Fincher et al. (2008) at <http://dx.doi.org/10.1098/rspb.2008.0094>. Additional data regarding historical pathogen prevalence are provided by Murray and Schaller (2010). Furthermore, since climate affects the transmission of infectious diseases, weather-related data may be valuable in modeling pathogen prevalence (Sachs (2000)). Such weather-related data are documented in Masters and McMillan (2001). Masters and McMillan (2001) present cross-country measures of frost area (i.e., the proportion of a nation's land averaging greater than five frost-days per month in winter) and frost-days (i.e., the nation's average number of frost-days per month in winter).

Additionally, Tang and Koveos (2008) and Hofstede (2001) identify an association between the nation's climate and its ranking on the Masculinity/Femininity spectrum. These authors propose that a warm climate contributes to the ultimate formation of a more Masculine culture. This contention is consistent with the Parental Investment theory (as described by Den Hertog (2004) and Van de Vliert et al. (1999)). This evolutionary social-psychological theory holds that greater male involvement in caring for the family is necessary in more extreme climates to ensure survival in more unforgiving environments. That is, in very cold climates (and in very

²⁴ Gelfand et al. (2011) and Fincher et al. (2008) note that the use of historical pathogen prevalence as an instrument greatly mitigates concerns regarding reverse causation.

hot climates), a greater commitment to the family is required by both parents. This leads to reduced differences in gender roles and a lower score on Hofstede's Masculinity/Femininity index. Conversely, in a warm climate, where the survival of the family is less in jeopardy due to environmental threats, males are typically less involved in the care of the family. This leads to greater asymmetry of gender roles and contributes to a more Masculine-oriented culture (i.e., larger differences in gender roles). Since Van de Vliert et al. (1999) present empirical evidence supporting this proposed relation between climate and culture, we suggest that characteristics of a nation's climate may also serve as instrumental variables for the nation's ranking on Hofstede's Masculinity/Femininity scale. Van de Vliert et al. (1999) measure climate using average temperatures while Hofstede measures climate using latitudes (i.e., higher latitudes are associated with colder temperatures). Cross-country data for both are readily available. For temperature data, see Van de Vliert et al. (1999), Parker (1997), and Garver et al. (1990). For latitude data, see Hall and Jones (1999), LaPorta et al. (1999), and Tobler et al. (1995).

V.G. Historical Factors as Potential Instrumental Variables

A good instrument should provide an exogenous source of variation in the potentially endogenous variable (Acemoglu et al. (2001)). Since Licht et al. (2005) specify that "truly" exogenous variables include major historical events, we next consider how history may suggest instrumental variables for possible use in modeling national culture. Nunn and Wantchekon (2011; p. 3250) offer support for this endeavor by writing, "One reason that history matters today is through the evolution of cultural norms".

Acemoglu et al. (2014), Licht et al. (2007), Licht et al. (2005), Acemoglu et al. (2001), and Mauro (1995) identify that a nation's colonial history should be considered as an exogenous source of variation in the process of institutional and economic development. For example, Licht et al.

(2007), Licht et al. (2005), and Acemoglu et al. (2001) suggest that, compared to colonization by other European powers, colonization by the British had profound social and economic implications. These authors hold that the former British colonies were generally characterized by an environment of active self-determination and self-assertion, an inclination toward venturing and entrepreneurial undertakings, and a predisposition for pragmatic change. These types of traits would be used by Schwartz to position a culture along his Harmony/Mastery spectrum (and would register these cultures as high in Mastery and low in Harmony). Since colonial history is perceived as an exogenous source of variation and is strongly related to the Harmony/Mastery cultural value dimension, it appears to be another potentially compelling instrumental variable. Breuer and Salzmann (2012), Licht et al. (2007), and Licht et al. (2005) use colonial heritage indicator variables (specifically considering whether the British were the original colonizer) as instruments for the Schwartz value of Harmony/Mastery.²⁵

Additionally, the findings of Griffin et al. (2013) suggest that a nation's colonial history may serve as an instrument for Hofstede's Individualism metric. Further noting that cultural characteristics differ between former British and former non-British colonies, Griffin et al. (2013) identify that a nation's level of Individualism is significantly higher for former British colonies and significantly lower for former Iberian colonies. Since these correlations are consistent with the theory of Licht et al. (2007), Licht et al. (2005), Acemoglu et al. (2001), and North et al. (2000), we contend that a country's colonial history may also be used as an instrument for Individualism. Cross-country data for colonial history are available from Hensel (2009), from Treisman (2000),

²⁵ Licht et al. (2007; p. 676) describe the use of the British heritage indicator variable: "The historical fact of having been under British rule can serve as an instrument for current cultural emphases on harmony as it is not susceptible to reverse causality from current economic or institutional conditions. Such a dummy variable is consistent with each and any of the accounts that distinguish British from other (mostly Latin) colonization."

from Von der Mehden (1969), from the World Handbook of Political and Social Indicators, and from the CIA World Factbook.

History of wars may have further applications as a potential instrumental variable. Gelfand et al. (2011) contend that cultural differences may be forged in the crucible of territorial conflicts. Specifically, a history of human threats heightens the need for social coordination and discourages non-conformist behavior. Accordingly, a society may be galvanized by a historical exposure to territorial threats and may thus develop a more Collectivist culture. Therefore, a nation's history of wars may represent a potential instrument for the Individualism/Collectivism dimension.

Furthermore, Putnam (1993) holds that levels of trust between people often evolve through a centuries-long history of interactions. As such, historical factors may also be exogenous determinants of the amount of trust between nations and thus may be considered as an instrumental variable for the cultural dimension of Trust. For example, Guiso et al. (2009) and Guiso et al. (2006) present evidence that the history of wars between nations may be a reasonable instrument for the levels of trust between pairs of countries. For data regarding the history of wars between pairs of countries, see <http://www.kellogg.northwestern.edu/faculty/sapienza/htm/research/htm>.

Siegel et al. (2013) also provide evidence that a nation's war history affects its cultural predisposition by focusing on determinants of a society's level of Egalitarianism. Social scientists such as Tilly (1993) and Holsti (1991) note that engaging in wars, especially those fought during the era of state formation in the 1800s, required significant sacrifice from the lower classes. To evoke a milieu of "equality of sacrifice" (Wilensky, 1975), the ruling strata of many societies were willing to broaden political rights and expand opportunities for social mobility. While necessary to promote national solidarity and facilitate state formation, these concessions by the elites also contributed to a more Egalitarian culture. Accordingly, Siegel et al. (2013) use a nation's war

history during the 19th Century as an instrumental variable for Egalitarianism.²⁶ Cross-country data for war history are available from Roser (2015) and Holsti (1991). To access data from Roser (2015), see <http://ourworldindata.org/data/war-and-peace/war-and-peace-before-1945/>.

Siegel et al. (2013), Licht et al. (2005), and Carl et al. (2004) also identify historical factors as exogenous determinants of societal values. These studies contend that a nation with a history of communist rule is more likely to be characterized by a more Hierarchical culture. An exogenous shock in most countries, the implementation of communist ideology contributed to greater hierarchical value emphases (Siegel et al., 2012). Furthermore, Siegel et al. (2013) and Schwartz et al. (2000) note that communist governments, despite espousing egalitarian platitudes, actually imposed strictly hierarchical regimes with considerable societal inequalities and with limited checks and balances over the political leadership. Following Siegel et al. (2013), we suggest that the history of communist rule within a nation may serve as an instrument for Hierarchy/Egalitarianism. Cross-country data for history of communist control (as well as for many other measures of a nation's political and governmental environment) are available from the Polity IV database. These data are available at <http://systemicpeace.org/polity/polity4.htm>.

V.H. Economic Factors as Potential Instrumental Variables

The extant literature has identified strong associations between various economic outcomes and various aspects of national culture. Specifically, entrepreneurship may be more likely in a cultural setting that embraces ambiguity and tolerates uncertainty. Thus, as suggested by Barnea et al. (2010), Heaton and Lucas (2000), and Barsky et al. (1997), we may expect greater entrepreneurial activity in a society characterized by a lower Uncertainty Avoidance Index (UAI).

²⁶ Siegel et al. (2013) focus on wars during the 19th Century as an instrument for Egalitarianism because conflicts during this period of state formation required the social and political changes thought to affect the nation's level of Egalitarianism. As noted by Holsti (1991), wars in the 20th Century were more about territorial expansion and were less about state formation.

Furthermore, Seigel et al. (2013) identify that entrepreneurship is more common in a society scoring higher in Mastery (lower in Harmony). This economic proclivity is consistent with the Schwartz dimension of Mastery/Harmony (which specifies that a high Mastery culture will reward daring, ambition, and material success). As such, the nation's level of entrepreneurship may serve as an instrument both for UAI and for Mastery/Harmony. Country-level data for entrepreneurial activity are available from the New Business Activity Index of the Global Entrepreneurship Monitor (Minitti et al. (2005)), from the World Bank Group Entrepreneurship Survey (Klapper et al. (2007)), and from the World Bank Development Indicators dataset (<http://data.worldbank.org>).

Recognizing further associations between cultural values and economic outcomes, Gupta et al. (2004) contend that social inequality may be correlated with income inequality. That is, we should expect a positive relation between the nation's PDI (i.e., Hofstede's measure of social inequity) and the nation's Gini coefficient (i.e., a standard measure of income inequity). This is consistent with Carl et al. (2004) who argue that a rigid societal class structure, as would be expected in a high PDI society, contributes to greater income asymmetry. Therefore, the nation's Gini coefficient may serve as an instrument for PDI. Country-level data for the Gini coefficient are available from the World Bank Development Indicators dataset (<http://data.worldbank.org>).

Gupta et al. (2004) additionally contend that economic data may provide insights regarding a society's standing on Hofstede's Masculinity/Femininity index. Gupta et al. (2004) propose that a nation with a smaller percentage of women in the workforce should rank higher on the Masculinity spectrum. This supposition is based on the observation by Tang and Koveos (2008) that lower female participation in the workforce reflects a society with greater differences in gender

roles (and thus a higher score on the Masculinity scale). The World Bank Development Indicators dataset contains country-level labor statistics (<http://data.worldbank.org>).

The magnitude and significance of a nation's technological innovations and inventions may serve as an instrument for its degree of Individualism. Henrich (2014), Gorodnichenko and Roland (2011b), and Shane (1992) document that countries characterized by individualistic cultures produce more patents, inventions, and technological advances. Gorodnichenko and Roland (2011b) hypothesize that this positive relation between Individualism and invention exists because an Individualistic society encourages and rewards innovation, personal ingenuity, and creativity.

Similarly, El Ghouli et al. (2016) identify a significant negative relation between invention/innovation and Embeddedness. Specifically, since a culture scoring high in Embeddedness bestows a greater degree of respect for tradition and adherence to existing practices, El Ghouli et al. (2016) expect less commitment to invention/innovation in a culture characterized by high Embeddedness. Therefore, we propose that the level of invention/innovation may also serve as an instrument for Embeddedness.

Gorodnichenko and Roland (2011b) measure the intensity of innovative activity by identifying the nation's patents per million population and the nation's score on the innovation performance index from the Economist Intelligence Unit (EIU). Data are available at the EIU website (http://graphics.eiu.com/PDF/Cisco_Innovation_Complete.pdf). Additionally, for information regarding patent applications, see the World Bank Development Indicators database (<http://data.worldbank.org>).

Historical methods of subsistence may have also affected the formation of national culture. As articulated by Berry (1967), the "subsistence theory" of development holds that some methods of subsistence are predicated on greater levels of functional interdependence. If a population's

livelihood, and initially its survival, required more cooperative endeavors, the society evolved to become more interdependent (and thus became more Collectivist). Conversely, in societies characterized by methods of subsistence in which people did not need to depend on each other as much, the culture became more Individualistic. Specifically, Talhelm et al. (2014) note that the farming of rice requires large amounts of coordinated effort while the farming of wheat is much less labor intensive. Talhelm et al. (2014) present evidence that regions historically conducting rice farming developed cultures that were more interdependent (i.e., the people were more Collectivist) because the cultivation of rice required much greater reliance on others. Alternatively, the people in regions historically involved in wheat farming are more independent (i.e., the people were more Individualistic). Accordingly, following this example from Talhelm et al. (2014), we contend that differences in a nation's historical source of subsistence (such as rice vs. wheat farming) should contribute to differences in national culture.

Easterly and Levine (2003), Acemoglu et al. (2001), Sokoloff and Engerman (2000), and Engerman and Sokoloff (1997) note that, in nations with economies traditionally predicated on activities conducive to scale economies (such as extracting minerals or producing crops on plantations), the ruling elites and/or the colonial authorities designed institutions to consolidate power and facilitate the exploitation of the indigenous population and the natural resources. In such environments, large class differences emerged and social stratification was reinforced by authoritative and absolutist states. As a result, the cultures of countries with economies predicated on mining and/or operating plantations (e.g., such as producing sugarcane, bananas, coffee, or rubber) exhibited large degrees of power distance (high PDI) and substantial amounts of social inequality (low Egalitarianism). Conversely, in countries where the primary crops could be effectively cultivated on smaller plots of land (such as wheat or maize), family farming dominated,

a robust middle class developed, and power and wealth were more widely distributed. As such, the cultures of these nations with “grain” economies featured lower degrees of power distance (low PDI) and greater proclivity towards social equality (high Egalitarianism). Based upon this theory focusing on the primacy of traditional means of subsistence, Easterly and Levine (2003) use measures reflecting a country’s dependence on mining and plantation crops as instrumental variables in models focusing on institutional quality. We similarly contend that measures of economic activities (such as the prevalence of mining or the type of crop) may also serve as instruments for PDI and for Egalitarianism. The data are readily available. Cross-country data regarding agricultural production are from the Food and Agriculture Organization (FAO) of the United Nations (<http://faostat3.fao/home/E>) or from Easterly (2001). Cross-country data regarding mining are from the World Bureau of Metal Statistics (<http://www.world-bureau.com/>), from Index Mundi (<http://www.index.mundi.com/minerals/>), from Hall and Jones (1999), and from Parker (1997).

VI. Summary and Conclusion

In an overview of editorial experiences, Shugan (2004) notes that “endogeneity” is a prominent item on the reviewer’s “fitness checklist”, and Larcker and Rusticus (2010) and Gillan (2006) reference the standard “endogeneity critique” of empirical research. An example of empirical analyses vulnerable to the endogeneity criticism, studies of the relation between national culture and economic outcomes may be plagued by the correlated omitted variables problem. Specifically, the findings of these papers may be affected by an omitted variable that is correlated with both the measures of culture and the economic outcome being studied. To mitigate concerns about omitted variables and more clearly demonstrate causality, Ahern et al. (2015), Eun et al. (2015), Licht et al. (2007), Guiso et al. (2006) and many others utilize instrumental variables

analysis and employ exogenous instruments that represent inherited, slow-moving components of culture. These authors identify a rich set of exogenous instruments for use in instrumental variables analysis. We review those instruments in this paper, offer guidance to future authors regarding the theoretical and economic justification for specific instruments, and provide resources regarding the sources of data to form the respective instrumental variables.

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Table 1

Endogenous variable – Individualism

This table presents variables that the extant literature identifies as potential exogenous instruments for the cultural value dimension of Individualism (Hofstede; 1980). The first column lists the potentially exogenous instrument. The second column provides specific references offering justification for the use of the particular instrument. References in bold distinguish papers in which the variable was explicitly used as an instrument in IV analysis. The other references are papers that provide theoretical and/or empirical justification for the use of the variable as an instrument (but do not explicitly conduct IV analysis). In the last column, we provide the source for data to form the instrument.

<u>Exogenous instrument</u>	<u>Used by/suggested by</u>	<u>Data source</u>
Genetic: Fst Index (genetic distance from U.S.)	Ahern et al. (2015); Eun et al. (2015); Gorodnichenko and Roland (2011a, 2011b, 2015)	Figure 5, p.43 of Gorodnichenko and Roland (2015) http://sites.tufts.edu/enricospoloare/research
Genetic: 5-HTTLPR gene (prevalence of short allele)	Chiao and Blizinsky (2010); Way and Lieberman (2010); Caspi et al. (2003)	http://rspb.royalsocietypublishing.org/content/277/1681/529.figures-only
Genetic: A1186 gene (prevalence of G allele)	Gorodnichenko and Roland (2011b); Way and Lieberman (2010)	Figure 1, p.206 of Way and Lieberman (2010)
Religion: Protestant religion	Griffin et al. (2013); Li et al. (2013)	http://worldreligiondatabase.org/ http://www.worldvaluessurvey.org (in Wave 6, see question V144) Table 1, Panel B, pp.236-237 of Guiso et al. (2003)
Linguistic: Pronoun drop language	Gorodnichenko and Roland (2011a, 2011b, 2015); Licht et al. (2007); Kashima and Kashima (1998)	Appendix A, pp.479-481 of Kashima and Kashima (1998) Appendix A.3., pp.684-685 of Licht et al. (2007)
Behavioral: Prevalence of team sports	Gupta et al. (2004)	http://biggestglobalsports.com

Behavioral: Prevalence of divorce	Talhelm et al. (2014); Lester (1995)	http://www.un.org/esa/population/publications/WMD2008/WP_WMD_2008/Data.html
Demographic: Ethnic fractionalization	Griffin et al. (2013); Licht et al. (2007); Guiso et al. (2006)	http://go.worldbank.org/K7WYOA8T0 http://doi.org/10.3886/ICPSR05029.V2 http://faculty.smu.edu/kdesmet
Geographic: Pathogen prevalence	Gorodnichenko and Roland (2011a, 2011b, 2015); Fincher et al. (2008)	http://dx.doi.org/10.1098/rspb.2008.0094
History: Colonization by British	Breuer and Salzmänn (2012); Licht et al. (2007); Licht et al. (2005); Acemoglu et al. (2001); North et al. (2000)	CIA World Factbook Handbook of Political and Social Indicators http://www.icow.org/colhist.html
History: Period of wars	Gelfand et al. (2011)	
Economic: Technological innovations and inventions	Henrich (2014); Gorodnichenko and Roland (2011b); Shane (1992)	http://graphics.eiu.com/PDF/Cisco_Innovation_Complete.pdf http://data.worldbank.org
Economic: Method of subsistence (wheat vs. rice)	Talhelm et al. (2014); Berry (1967)	http://faostat3.fao/home/E

Table 2

Endogenous variable – Uncertainty Avoidance Index (UAI)

This table presents variables that the extant literature identifies as potential exogenous instruments for the cultural value dimension of Uncertainty Avoidance (Hofstede; 1980). The first column lists the potentially exogenous instrument. The second column provides specific references offering justification for the use of the particular instrument. References in bold distinguish papers in which the variable was explicitly used as an instrument in IV analysis. The other references are papers that provide theoretical and/or empirical justification for the use of the variable as an instrument (but do not explicitly conduct IV analysis). In the last column, we provide the source for data to form the instrument.

<u>Exogenous instrument</u>	<u>Used by/suggested by</u>	<u>Data source</u>
Genetic: 5-HTTLPR gene (prevalence of short allele)	Kuhnen et al. (2013); Chiao and Blizinsky (2010); Way and Lieberman (2010); Kuhnen and Chiao (2009); Munafo et al. (2005); Stein et al. (2007)	http://rspb.royalsocietypublishing.org/content/277/1681/529 . figures-only
Religion: Hierarchical religion (Catholic, Greek Orthodox, Muslim)	Griffin et al. (2013); Li et al. (2013); Kwok and Tadesse (2006); Guiso et al. (2003, 2006); LaPorta et al. (1999)	http://worldreligiondatabase.org/ http://www.worldvaluessurvey.org (in Wave 6, see question V144) Table 1, Panel B, pp.236-237 of Guiso et al. (2003)
Linguistic: Multiple second person pronouns	Breuer and Salzmänn (2012); Kashima and Kashima (1998)	Appendix A, pp.479-481 of Kashima and Kashima (1998)
Demographic: Ethnic heterogeneity	Griffin et al. (2013); Kwok and Tadesse (2006); Alesina et al. (2003)	Appendix, Table A.1., pp.184-189 of Alesina et al. (2013)
Economic: Prevalence of entrepreneurship	Barnea et al. (2010); Heaton and Lucas (2000); Barsky et al. (1997)	New Business Activity Index of the Global Entrepreneurship Monitor; World Bank Group Entrepreneurship Survey http://data.worldbank.org

Table 3

Endogenous variable – Power Distance Index (PDI)

This table presents variables that the extant literature identifies as potential exogenous instruments for the cultural value dimension of Power Distance (Hofstede; 1980). The first column lists the potentially exogenous instrument. The second column provides specific references offering justification for the use of the particular instrument. References in bold distinguish papers in which the variable was explicitly used as an instrument in IV analysis. The other references are papers that provide theoretical and/or empirical justification for the use of the variable as an instrument (but do not explicitly conduct IV analysis). In the last column, we provide the source for data to form the instrument.

<u>Exogenous instrument</u>	<u>Used by/suggested by</u>	<u>Data source</u>
Behavioral: Diplomatic parking violations	Fisman and Miguel (2007); Glaeser et al. (2004)	Table 1, pp.1027-1032 of Fisman and Miguel (2007)
Geographic: Settler mortality	Acemoglu et al. (2001)	Appendix, Table A2, p.1398 of Acemoglu et al. (2001)
Geographic: Climate	Carl et al. (2004); Hall and Jones (1999); LaPorta et al. (1999); Tobler et al. (1995); Hofstede (1980)	http://web.stanford.edu/~chadj http://www.ciesen.org/gpw/globdem.html
Geographic: Historical population density	Griffin et al. (2013); Glaeser et al. (2004); Acemoglu et al. (2002)	http://economics.mit.edu/faculty/acemoglu/data/hcapital
Economic: Income inequality (Gini Coefficient)	Gupta et al. (2004); Carl et al.(2004)	http://data.worldbank.org
Economic: Method of subsistence (prevalence of scale economies)	Easterly and Levine (2003); Acemoglu et al. (2001); Sokoloff and Engerman (2000); Engerman and Sokoloff (1997)	http://faostat3.fao/home/E http://www.world-bureau.com/ http://www.index.mundi.com/minerals/ http://web.stanford.edu/~chadj

Table 4

Endogenous variable – Masculinity

This table presents variables that the extant literature identifies as potential exogenous instruments for the cultural value dimension of Masculinity (Hofstede; 1980). The first column lists the potentially exogenous instrument. The second column provides specific references offering justification for the use of the particular instrument. References in bold distinguish papers in which the variable was explicitly used as an instrument in IV analysis. The other references are papers that provide theoretical and/or empirical justification for the use of the variable as an instrument (but do not explicitly conduct IV analysis). In the last column, we provide the source for data to form the instrument.

<u>Exogenous instrument</u>	<u>Used by/suggested by</u>	<u>Data source</u>
Geographic: Climate (temperature)	Tang and Koveos (2008); Hofstede (2001); Den Hertog (2004); Van de Vliert et al. (1999)	
Geographic: Climate (latitude)	Van de Vliert et al. (1999); Tang and Koveos (2008); Hofstede (2001); Den Hertog (2004)	http://web.stanford.edu~chadj
Economic: Prevalence of women in workforce	Gupta et al. (2004)	http://data.worldbank.org

Table 5

Endogenous variable – Egalitarianism

This table presents variables that the extant literature identifies as potential exogenous instruments for the cultural value dimension of Egalitarianism (Schwartz; 1986). The first column lists the potentially exogenous instrument. The second column provides specific references offering justification for the use of the particular instrument. References in bold distinguish papers in which the variable was explicitly used as an instrument in IV analysis. The other references are papers that provide theoretical and/or empirical justification for the use of the variable as an instrument (but do not explicitly conduct IV analysis). In the last column, we provide the source for data to form the instrument.

<u>Exogenous instrument</u>	<u>Used by/suggested by</u>	<u>Data source</u>
Linguistic: Linguistic heterogeneity	Siegel et al. (2013); Siegel et al. (2011)	http://www.ethnologue.com http://ielex.mpi.nl .
Linguistic: English language	Easterly and Levine (2003); Hall and Jones (1999); Kaufman et al. (1999)	http://web.stanford.edu/~chadj http://www.worldvaluessurvey.org (in Wave 6, see question V247)
Linguistic: Western European language	Easterly and Levine (2003); Hall and Jones (1999); Kaufman et al. (1999)	http://web.stanford.edu/~chadj http://www.worldvaluessurvey.org (in Wave 4, see question V105)
Behavioral: Diplomatic parking tickets	Siegel et al. (2013); Fisman and Miguel (2007); Licht et al. (2007)	Table 1, pp.1027-1032 of Fisman and Miguel (2007)
Demographic: Ethnic fractionalization	Siegel et al. (2013); Licht et al. (2007); Coffee (2001); Mauro (1995)	http://go.worldbank.org/K7WYOA8T0 http://doi.org/10.3886/ICPSR05029.V2 http://faculty.smu.edu/kdesmet

History: History of wars	Siegel et al. (2013); Tilly (1993); Holsti (1991); Wilensky (1975)	http://ourworldindata.org/data/war-and-peace/war-and-peace-before-1945/
History: Period of Communist rule	Siegel et al. (2013); Licht et al. (2005); Carl et al. (2004); Schwartz et al. (2000)	http://systemicpeace.org/polity/polity4.htm

Economic: Method of subsistence (scale economies)	Easterly and Levine (2003); Acemoglu et al. (2001); Sokoloff and Engerman (2000); Engerman and Sokoloff (1997)	http://faostat3.fao/home/E http://www.world-bureau.com/ http://www.index.mundi.com/minerals/ http://web.stanford.edu/~chadj
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Table 6

Endogenous variable – Mastery

This table presents variables that the extant literature identifies as potential exogenous instruments for the cultural value dimension of Mastery (Schwartz; 1986). The first column lists the potentially exogenous instrument. The second column provides specific references offering justification for the use of the particular instrument. References in bold distinguish papers in which the variable was explicitly used as an instrument in IV analysis. The other references are papers that provide theoretical and/or empirical justification for the use of the variable as an instrument (but do not explicitly conduct IV analysis). In the last column, we provide the source for data to form the instrument.

<u>Exogenous instrument</u>	<u>Used by/suggested by</u>	<u>Data source</u>
History: Colonization by British	Breuer and Salzmann (2012); Licht et al. (2007); Licht et al. (2005) ; Acemoglu et al. (2001)	CIA World Factbook Handbook of Political and Social Indicators http://www.icow.org/colhist.html
Economic: Prevalence of entrepreneurship	Siegel et al. (2013)	New Business Activity Index of the Global Entrepreneurship Monitor World Bank Group Entrepreneurship Survey http://data.worldbank.org

Table 7

Endogenous variable – Embeddedness

This table presents variables that the extant literature identifies as potential exogenous instruments for the cultural value dimension of Embeddedness (Schwartz; 1986). The first column lists the potentially exogenous instrument. The second column provides specific references offering justification for the use of the particular instrument. References in bold distinguish papers in which the variable was explicitly used as an instrument in IV analysis. The other references are papers that provide theoretical and/or empirical justification for the use of the variable as an instrument (but do not explicitly conduct IV analysis). In the last column, we provide the source for data to form the instrument.

<u>Exogenous instrument</u>	<u>Used by/suggested by</u>	<u>Data source</u>
Genetic: DRD4 gene (prevalence of 7-repeat allele)	Dreber et al. (2009); Chen et al. (1999); Castro et al. (1997); Benjamin et al. (1996)	Table 2, pp.314-315 of Chen et al. (1999)
Geographic: Climate (latitude)	Carl et al. (2004); Hall and Jones (1999) ; LaPorta et al. (1999) ; Tobler et al. (1995); Hofstede (1980)	http://web.stanford.edu/~chadj http://www.ciesen.org/gpw/globdem.html
Economic: Technological innovations and inventions	Henrich (2014); Gorodnichenko and Roland (2011b) ; Shane (1992)	http://graphics.eiu.com/PDF/Cisco_Innovation_Complete.pdf http://data.worldbank.org

Table 8

Endogenous variable – Trust

This table presents variables that the extant literature identifies as potential exogenous instruments for the cultural value dimension of trust. The first column lists the potentially exogenous instrument. The second column provides specific references offering justification for the use of the particular instrument. References in bold distinguish papers in which the variable was explicitly used as an instrument in IV analysis. The other references are papers that provide theoretical and/or empirical justification for the use of the variable as an instrument (but do not explicitly conduct IV analysis). In the last column, we provide the source for data to form the instrument.

<u>Exogenous instrument</u>	<u>Used by/suggested by</u>	<u>Data source</u>
Genetic: Physical appearance (anthropometric measures)	Ahern et al. (2015); Guiso et al. (2009)	http://www.kellogg.northwestern.edu/faculty/sapienza/htm/research/htm
Religion: Similarity of religions (between pairs of countries)	Guiso et al. (2009)	http://worldreligiondatabase.org/ http://www.worldvaluessurvey.org (in Wave 6, see question V144) Table 1, Panel B, pp.236-237 of Guiso et al. (2003)
Religion: Hierarchical religion	Licht et al. (2001); LaPorta et al. (1997b)	http://worldreligiondatabase.org/ http://www.worldvaluessurvey.org (in Wave 6, see question V144) Table 1, Panel B, pp.236-237 of Guiso et al. (2003)
Linguistic: Common language (between pairs of countries)	Guiso et al. (2009); Rodrik (2000)	http://www.ethnologue.com http://ielex.mpi.nl .
Demographic: Ancestor's country of origin	Guiso et al. (2006)	http://gssdataexplorer.norc.org (see question #1821 of GSS)
History: Years of war (between pairs of countries)	Guiso et al. (2006)	http://www.kellogg.northwestern.edu/faculty/sapienza/htm/research/htm