

INCOME INEQUALITY, THE WORLD VALUES SURVEY, AND THE INTERACTION OF CULTURAL DIMENSIONS

Jeffrey A. EDWARDS¹

Alfredo ROMERO

Cephas NAANWAAB

Abstract

Globally, the unequal distribution of income has been one of the hottest topics in development economics ever since Kuznets' famous hypothesis in 1955. Much of this research, however, avoids investigation into the effect(s) that cultural values and norms have on the level of income inequality in a nation--information that would be invaluable to governments addressing this topic. Using the World Values Survey, we find that secular, individualist societies will have lower inequality than traditional collective societies, but this generalization comes with caveats depending upon the level of income in the country and the degree of interaction between the two variables.

Keywords: World Values Survey, Gini coefficient, income inequality, culture, values

JEL: O1, O15, Z1

1. Introduction

There is empirical evidence to suggest that income inequality hinders economic growth (Cingano 2014), and many social scientists would argue that it plays a negative role in comprehensive economic development due to its influence on social, political, and economic outcomes. Large disparities in income amongst social strata have been linked to revolts, rent-seeking behavior, concentration of political powers, political instability, higher crime rates, educational disparities, lower levels of psychological well-being, imperfect capital markets, and a reduction in trust and cooperation between market participants (e.g., Nissanke and Thorbecke, 2006; Stiglitz, 2012; Pickett and Wilkinson, 2010; Celik and Basdas, 2010; Medgyesi, 2013). These problems are worsened if inequality lowers social mobility, perpetuating cycles of poverty and increasing the fragmentation and/or polarization of societal groups and can be further exacerbated if it is perceived by the population to be engrained (Dabla-Norris et al., 2015). Learning that one is at the bottom of a meritocracy and could reasonably stay there can generate productivity deterring emotions like jealousy or envy as well as shame regarding one's own performance (Ku and Salmon, 2013).

The theories and findings above are juxtaposed against those that find support for Kuznets' theory (1955), where the dynamics of inequality follow a pattern. Income inequality will increase in tandem with a nation's income until a level of development is reached, thereafter falling as nations develop further. The increasing portion of this inverted U curve is argued to be a necessary condition for countries to realize significant economies of scale. Higher levels of wealth, even if unevenly distributed, allow entrepreneurs to channel their talents into experimentation and innovation (Okun, 1975; Gorodnichenko and Roland 2012). It can also act as a societal catalyst, providing the fodder needed for institutional reforms to occur. For instance, Acemoglu and Robinson (2000) argue that the presence of high levels of inequality will encourage

¹ Professor, North Carolina A&T State University, Greensboro, North Carolina, USA.

democratization, eventually leading to lower levels of inequality through increased educational attainment and redistributive policies. Islam (2016), who finds that political freedom (e.g., democratization) brings a reduction in inequality across nations, supports the latter part of this theory.

Regardless of which side of the debate you are on, if lawmakers want to implement policies to influence inequality, such as income taxation schemes, subsidies for entrepreneurship(s), capital gains policies, transfer payments to individuals, etc., whether the policies themselves have any effect on inequality is likely to be a function of the cultural norms embedded in that country's population (Alesina et al., 2004; Alesina and Giuliano, 2015). Many of the results and theories previously mentioned need to be grounded in these values to make sense; for example, social mobility might be difficult in a collective society where individualism is frowned upon, but polarization of an individual or sub-group in the same society may be quite easy for the same reason. Cooperation among economic agents in a command economy where profit-making is discouraged and government involvement integral, would naturally take a different form than in a market economy where agents can interact with less regulation and oversight. In other words, knowing how a country's values and norms affect inequality will determine whether such policies will have any effect on it at all.

It is challenging defining exactly what culture is, how to measure it, and how to use it as a stand-alone determinant. According to Eckstein (1988), culture can be defined as "orientations to action and a general disposition to act in certain ways in sets of situations". Similarly, in DesAutels et al. (2015) it is defined as something that is "...acquired by people through their actions in society where the norms are established, and expectations of acceptable behavior defined". It is defined in Sakamoto et al. (2012) as encompassing "...a wide variety of potential variables including such phenomena as values and preferences, norms and social conventions, behavioral repertoires and social skills, as well as situational frameworks and shared understandings of world-views;" or it can be part of larger constructs as in Han et al. (2012), where "regimes are understood to be unique configurations of cultural, institutional, and socio-economic conditions framing people's ideas and behaviors." And there is Guiso et al.'s (2011) rather simple, but elegant, definition of culture as a set of customary beliefs and values that ethnic, religious and social groups transmit between generations.

Obviously, measuring various dimensions of culture while simultaneously trying to capture these definitions is a difficult task, and while there are several data sets that attempt to do just that, we chose to employ the World Values Survey (Inglehart et al., 2014). Our reasoning for choosing this data set is simple. First, all data sets in this area use either survey data or sets of determinants that attempt to capture the revealed preferences of a population, so each data set will be constructed very differently; this means that comparing estimates across data sets is pointless as it would be akin to the old adage 'comparing apples to oranges'. Second, this is not a research paper that focuses on the question of robustness in estimates across data types. Even though a research paper like that is most likely warranted and would be a great topic for future research, it is not one we address here. But lastly, and most importantly, the World Values Survey (WVS) has been around for decades, is a trustworthy and highly cited dataset, contains one of the largest surveys across 40 years spanning nearly 100 countries, and the survey

is randomly given directly to everyday citizens and not a particular subgroup of constituents. The organization that produces the survey and dataset put it most succinctly:

The survey, which started in 1981, seeks to use the most rigorous, high-quality research designs in each country. The WVS consists of nationally representative surveys conducted in almost 100 countries which contain almost 90 percent of the world's population, using a common questionnaire. The WVS is the largest non-commercial, cross-national, time series investigation of human beliefs and values ever executed, currently including interviews with almost 400,000 respondents. Moreover, the WVS is the only academic study covering the full range of global variations, from very poor to very rich countries, in all of the world's major cultural zones.²

The WVS has been employed across many disciplines (Zhao and Cao, 2010; Adkisson and McFerrin, 2014; Beja, 2018; Allison et al., 2021) and has proven its usefulness countless times, including with studies of income inequality. For instance, Jen et al., (2009) investigate Wilkinson's income inequality hypothesis and find no relationship between health and inequality. Sommet et al., (2018) investigate the status-anxiety hypothesis and find that inequality isn't a problem for psychological health but enhance the consequences of financial scarcity. Schroder (2017) finds people are less satisfied with their lives if inequality within their country increases. Rozer and Volker (2016) investigate whether inequality is associated with poorer health and find that it isn't after age 36 but find that younger adults are more susceptible as it erodes social trust. Most relevant to our work is Mikucka et. al., (2017) and Elgar et al., (2020). The former investigates inequality from a government policy perspective and find that policymakers should, among other objectives, work to reduce income inequality, while the latter uses the Gini coefficient and the WVS to find that mortality was positively related to inequality, trust and group affiliations and negatively related to social capital. That said, these studies are mostly health-related, or happiness and welfare related and all either use an older version of the WVS and/or peel out individual questions from the survey for their analysis.

To be sure, our study is not one of comparing the viability of datasets, it is one of answering the question, *using the WVS, how do cultural differences across nations affect income inequality and do the cultural dimensions of traditionalism to secularism and collectivism to individualism interact with one another to complicate this relationship?*³

A priori, we believe there may indeed be interaction between the two aggregated cultural dimensions of the WVS, and the reason is simple. Let us assume we have a culture that embraces a more traditional form of existence, is it reasonable to conclude

² <https://www.worldvaluessurvey.org/WVSContents.jsp>

³ We took the liberty of changing the labels of two of the WVS cultural dimensions, so they better coincide with jargon used in economic research. As explained and justified later in the paper, what we label as collectivism and individualism, the WVS labels as survival and self-expressionist respectively.

that the marginal effect this traditional life has on inequality would be constant as this country moves from more of a collective economy where income redistribution is accepted and even championed to a capitalist economy where it isn't? Or does it make sense that the effect a secular culture, which may not embrace the traditional philanthropic ideals as a traditional culture would, has on inequality would stay constant as the economy transitions from a market economy where entrepreneurship and wealth are rewarded to a more collective one where advancement beyond the 'village' is frowned upon? The answer to each could be yes, or no, or somewhere in between. In this paper, we intend to empirically find the answer while leaving what could be very complicated theoretical explanations for future research(ers)--but this also leads us to our next reason for this study which is the issue of statistical adequacy. A failure to include an interaction term in any model, where one should be, can cause serious misspecification issues and affect a regression's orthogonality condition; any attempt, then, at statistical inference would be rendered unreliable unless the interaction is included in the regression(s) (Braun 1988, Spanos 1999, Edwards et al. 2016, Edwards et al., 2017).

Our findings indicate that the degree of a society's link to traditional values in lower income countries significantly interacts with that culture's level of collectivism to generate marginal effects on the Gini coefficient that are conditional upon the values of the interacting variable; for example, a traditional, secular culture may realize higher inequality, but a traditional, collective culture may not. On the other hand, for higher income economies, there is no direct interaction between the two, although statistical significance does vary. These results are interesting because the depth at which these cultural norms are embedded in society tells us whether it is beneficial and/or feasible to implement policy that push outcomes favorable to affecting inequality and establishes the fact that future researchers using these cultural variables must allow for interaction between these dimensions before drawing meaningful inference from their results.

2. Data and Method

The information gleaned from the WVS aggregates countries into two simple and most importantly, measurable dimensions--(1) traditional versus secular values and (2) survival versus self-expressionist values. The traditional versus secular dimension is quite clearly defined as reflecting "...the contrast between societies in which religion is very important and those in which it is not, but deference to the authority of God, fatherland, and family are all closely linked with each other."⁴ In other words, does your 'family' follow the traditional cultural norms developed in the past, or are family members willing to separate themselves from these engrained (mostly religious) traditions to move in a secular direction where rational behavior is dictated more by facts-on-the-ground and less by philosophy. On the other hand, the survival versus self-expressionist dimension is more complicated.

Economically speaking, survivalist values are highly collective in nature. Survivalist cultures "...feel threatened by foreigners, ethnic diversity, and cultural change", and are "...relatively favorable to authoritarian government."⁵ Command and

⁴ <https://www.worldvaluessurvey.org/WVSCContents.jsp?CMSID=Findings>

⁵ <https://www.worldvaluessurvey.org/WVSCContents.jsp?CMSID=Findings>

command-like economies certainly fall into this definition where there is an emphasis on working toward common goals, working within communal rules and guidelines, and very little subversion of societal norms. Self-expressionist societies are the opposite--"self-expression values reflect an emancipative and humanistic ethos, emphasizing human autonomy and choice." These economies would likely embrace entrepreneurship, individual gains in wealth, less government, etc. In terms of economic outcomes, perhaps a better name for survivalism is indeed 'collectivism', and self-expression is better labeled 'individualism'. Support for this more economically descriptive labeling can be found in Inglehart and Oyserman, (2004) --"Individualism-Collectivism taps the same dimension of cross-cultural variation as does Survival/Self-expression values (which reflect the extent to which people give top priority to individual choice, over survival needs). It has been demonstrated that Survival/Self-expression values are becoming more widespread through intergenerational changes that emerge at high levels of economic development when existential constraints on human choice recede". Therefore, for the remainder of the paper and for the benefit of reducing confusion in an economic context, we will label this dimension of cultural values as *collectivism and individualism* instead of survivalism and self-expressionism.

The degree of collectivism (mostly using proxies) on this and similar topics has received significant attention in the literature. According to Nikolaev et al. (2017), this dichotomy is one of the most important cultural factors of economic development. Broadly speaking, individualism emphasizes personal freedom and achievement while collectivism emphasizes group interests and discourages individual behavior (Madsen and Yan 2013). Collectivist societies encourage conformity and discourage individuals from standing out from the group through a variety of restrictive social norms that undermine individual achievement in favor of group solidarity--this may lead to lower inequality (Hofstede, 1991; Gorodnichenko and Roland, 2012; Rosenbaum et al. 2016; Pitlik and Rode, 2017). On the other hand, ties between people/groups in individualistic societies are loose and everyone is expected to look after "themselves and their immediate family" (Hofstede et al. 2010). These societies tend to value traits like personal freedom, self-reliance, creative expression, intellectual and affective autonomy, minimal government intervention, and reward individual accomplishments with higher social status--this may lead to greater inequality (Nikolaev et al., 2017; Medgyesi, 2013).

The traditional versus secular dimension of culture has received less attention. How traditional or secular a society is will have different effects on income inequality through the creation and/or preservation of social status. Madsen and Yan (2013) argue that secular societies encourage individual behavior and may be more prone to tolerate higher levels of inequality while non-secular (traditional) societies tend to emphasize collectivist behavior. On the other hand, we believe that traditional cultures may encourage businesses to be handed down over generations within tightknit clans and/or family groups, thereby allowing long term growth and the accumulation of wealth which could lead to greater inequality across the population as a whole. Regardless, with these and the arguments made earlier, it seems as though the degree of traditionalism in a culture should affect inequality.

The surveys in the WVS are conducted in seven "waves" starting in 1981 to 2020 and combines ten important indicators to create the two dimensions of cross-cultural

variation. The variable TradAgg measures the degree of traditional values while SurvSagg measures how collective that society is. While the actual value of these two variables is meaningless (at least for this paper), their sign and relative values are not. For instance, a negative value for TradAgg means that a particular society, on average, embraces traditional values while a positive value implies they embrace secular values. Within that continuum, the more negative the value the more traditional they are and the more positive the more secular they are. The same dynamic applies to the SurvSagg variable with a negative value indicating a collectivist society and a positive value indicating a more individually focused society.

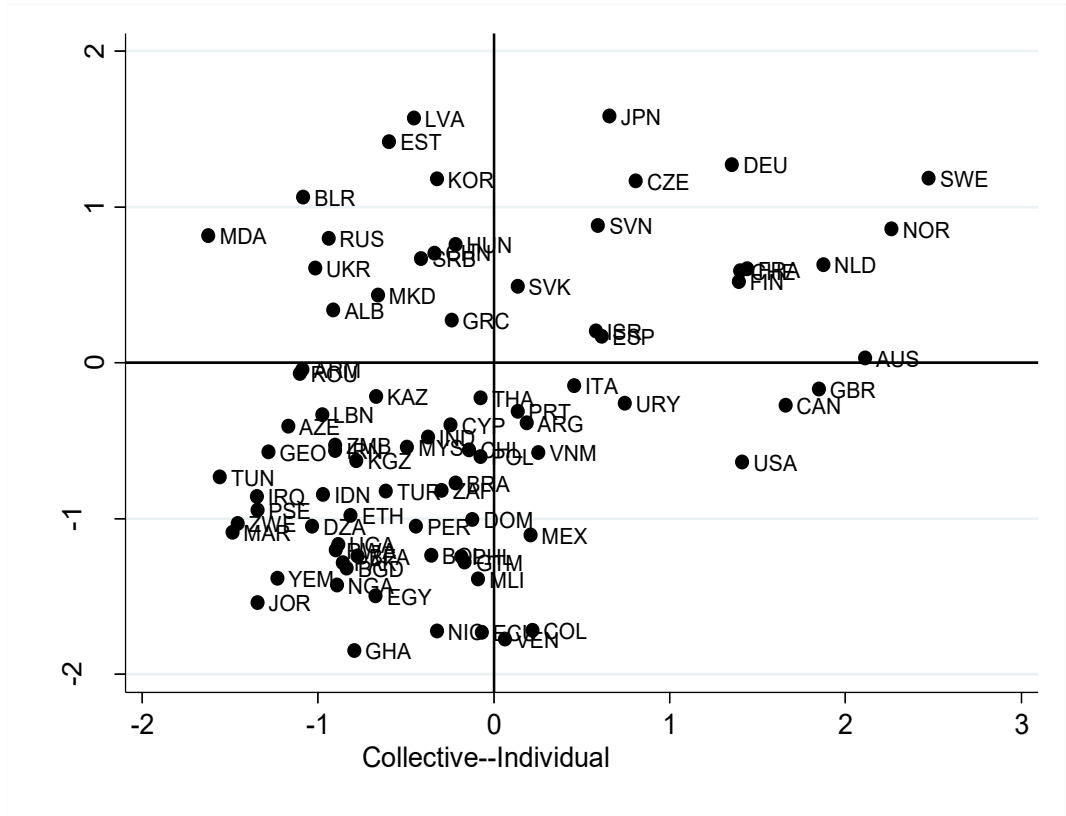
After merging this data with our Gini and control group data, TradAgg values in our sample range from -2.017 to 1.863 with a mean of -0.232, and SurvSagg ranges from -1.857 to 2.994 with a mean of -0.067. In other words, on average, countries in our sample lean traditional and collective. Figure 1 plots our countries based upon their average score across all available survey waves for that country. Some of the more noticeable countries are the USA and Canada which are solidly in the individualist camp but with traditional values, countries such as Russia, Latvia and Estonia are secular but collective, Tunisia and Jordan are traditional and collective, and Japan, Sweden and Norway embrace individualism and are also highly secular.

The simple correlation coefficient between these two variables is 0.346, and Figure 1 supports this as there does seem to be some increase from lower left to upper right embodied in the scatter plot. Naturally, if anyone was interested in investigating how these two variables affect income inequality, there would be omitted variable bias (in the statistical sense) if such an interaction was not included. Many of the arguments made earlier in this paper show that the degree of collectivism in a society will influence and/or be influenced by the degree of secularism, so it makes sense that these two variables would interact with one another at some level.

We will use the Gini coefficient to measure income inequality for a few reasons. While the Gini coefficient is not a perfect measure of inequality (Atkinson 1975, Cowell, 1995), it is one of the most widely used which allows future researchers to directly compare our findings with much of the literature, it is available for a greater number of countries and time periods than most measures, and we get the data for it from the World Bank which is the same place we source our control variable data, giving us some consistency in data collection and inference.

To stay consistent with the existing inequality literature, we added a set of control variables (X 's) obtained from the World Development Indicators dataset that are both economic and demographic in nature. These variables include a measure of trade openness (defined as the sum of exports and imports divided by GDP), population growth rates, and unemployment rates. While these variables are not of interest, several researchers argue for their inclusion (Zhou et al., 2011; OECD, 2011; Anyanwu et al., 2016; Braun, 1988). The inclusion of others (such as women's labor force participation rates) dramatically reduced our usable data set, resulting in the elimination of many countries from our cross-section, so these variables have not been included.

Figure 1: Scatter Plot of Countries Across Values Dimensions



We will run two main sets of regressions: regressions with just the variables of interest TradAgg and SurvSagg, and regressions with the full set of control variables. The number of observations pertaining to each will be 184 and 165, respectively; there are 82 countries in the former set and 76 countries in the latter, for an average number of observations per country of 2.24 and 2.17, respectively. We will also separate countries by development level as the inequality literature is largely based upon this dichotomy starting with Kuznets (1955). In an effort to keep the delineations simple, we will group high and upper-middle income economies as 'Higher Income' and lower-middle- and low-income economies as 'Lower Income' according to the World Bank's delineation of these groups.⁶ All regressions performed in this paper are robust to heteroskedasticity.

The basic model setup is

$$(1) \text{Gini}_{it} = \sum_{d=1}^2 [a_{0d} + a_{1d} \text{Tradagg}_{it} + a_{2d} \text{Survsagg}_{it} + a_{3d} \text{Tradagg}_{it} * \text{Survsagg}_{it} + a_{4d} x_{it-1}] + r_{it}$$

⁶ <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

where the subscript d stands for the development level just described. The two marginal effects of interest are

$$(2) \quad \frac{\partial Gini}{\partial Survsagg} = a_{2d} + a_{3d} Tradagg_{it}$$

$$(3) \quad \frac{\partial Gini}{\partial Tradagg} = a_{1d} + a_{3d} Survsagg_{it}$$

with standard errors

$$(4) \quad \sigma \frac{\partial Gini}{\partial Tradagg} = \sqrt{var(a_{1d}) + Survsagg_{it}^2 var(a_{3d}) + 2Survsagg_{it} cov(a_{1d}a_{3d})}$$

$$(5) \quad \sigma \frac{\partial Gini}{\partial Survsagg} = \sqrt{var(a_{2d}) + Tradagg_{it}^2 var(a_{3d}) + 2Tradagg_{it} cov(a_{2d}a_{3d})}$$

With these marginal effects, we will be able to estimate what impact increased secularism (TradAgg) has on the Gini coefficient as societies embrace more individualism (SurvSAgg), and vice versa. Since the TradAgg and SurvSAgg data are constructed in “waves,” sample means of all variables were created within the same waves with the X 's lagged by one wave period.

Table 1: Wave Periods for Variables		
Wave	Gini, TradAggSurvSAgg	X's
Wave 1:	1981-1984	1977-1980
Wave 2:	1990-1994	1985-1989
Wave 3:	1995-1998	1990-1994
Wave 4:	1999-2004	1995-1998
Wave 5:	2005-2009	1999-2004
Wave 6:	2010-2014	2005-2009
Wave 7:	2017-2020	2010-2014

Lagging the X 's by one period prevents any feedback to the Gini coefficient, however, if we lagged TradAgg and SurvSAgg, we would have lost an entire wave of observations. To make sure we did not have feedback from these variables to the Gini coefficient variable we performed a generalized Hausmann specification test where the null hypothesis is the coefficient estimate from a regression of the Gini coefficient on each of the two variables is no different from the estimate obtained from their instrumented counterparts (represented by their own lags). For SurvSAgg we obtained a χ^2 of 0.463, and for TradAgg we obtained a p-value of 0.871; therefore, we cannot reject the null that the coefficient estimates are equal, hence there is no statistically significant feedback from the Gini variable to SurvSAgg or TradAgg.

The reader will notice that the specification of (1) does not use fixed effects. We found that including fixed effects swamped our results of interest. Alderson and Nielsen (1999) effectively argued that fixed effects remove the between-country variation from the data and would preclude us from assessing both the within and between-country

variation. This would have to be the case if the cultural variables are relatively stable overtime. It also makes theoretical sense as individualism and secularism measure societal ideologies, structures, traditions and norms, most of which can arguably be influenced by unobservable phenomena that would normally be captured in a fixed effect. Therefore, the specification in (1) allows TradAgg and SurvSAgg to reflect and/or pick up at least some of these unobservable phenomena that could in turn affect inequality.

Because the marginal effects in (2) and (3) may not be constant across the values of the other variable, and because the standard errors of these effects are highly non-linear, graphical analysis using figures 2 through 4 later in the paper, will be the primary source of inference drawn from the estimates. The horizontal axis in the graphs will reflect the range of each variable, -3 to +3, while the vertical axes will reflect the estimates of the marginal effects at those values--in other words, the vertical axis will measure the effect of either TradAgg or SurvSAgg on the Gini coefficient across values of the other variable. Of particular interest will be exactly where does a 90% confidence interval constructed around these effects lie relative to zero. Any upper (lower) bound of the confidence interval that lies below (above) zero will indicate that the effect one variable has on the Gini coefficient is statistically significant at that value of the other variable.

3. Empirical Results

We start with Table 2 and the regression coefficient estimates for each of the model permutations--i.e., model (1) with and without control variables (Pooled), then for higher and lower income economies, respectively. We run the higher and lower income regressions separately because we do not want to make the assumption that the variance is equal across income levels--this would bias our inference by throwing off our standard errors.

Table 2: Estimates of Regression From (1)				
	Pooled	Pooled	Higher Income	Lower Income
TradAgg	-5.397** (0.000)	-3.608** (0.000)	-4.706** (0.000)	-4.434 (0.145)
SurvSAgg	0.680 (0.167)	0.064 (0.906)	-2.008** (0.010)	-0.306 (0.897)
TradAgg*SurvSAgg	-2.452** (0.000)	-2.723** (0.000)	-0.151 (0.843)	-4.074 (0.106)
Trade		-0.051** (0.006)	-0.067** (0.001)	-0.019 (0.443)
Pop. Growth		1.146 (0.112)	2.357** (0.036)	0.926 (0.333)
Unemp. Rate		0.058 (0.689)	0.098 (0.575)	-0.080 (0.654)
Constant	37.704** (0.000)	40.088** (0.000)	40.807** (0.000)	36.647** (0.000)
No. Observations	186	165	116	49
No. Countries	82	76	48	32
R-squared	0.338	0.379	0.557	0.171
P-values in parentheses. * indicates significance at 10% and ** at 5%.				

One of the first things the reader may notice in Table 2 is that while the number of observations in the higher and lower income groups sum to the same number as the pooled regression (i.e., 165 observations), the number of countries represented sum to 80 while the pooled regressions only cover 76; this is because four countries transitioned to high or low income during the waves the data covers. But one thing we find truly intriguing about these results is that the adjusted R^2 values are very high even though we are only running standard OLS regressions without fixed effects. Specifically, the pooled regressions range around 0.350 with a higher income regression R^2 of 0.557. This means that this small conditioning set explains a very high 35% and 55% respectively, of the variation in the Gini coefficient. This same statistic for the lower income group is only 0.171, but, as mentioned earlier, this is not the entire story as the coefficient estimate for the interaction term is fixed here but may not be--we discuss this in more detail later when we evaluate the graphical representation(s) of this output.

The results themselves tell an interesting, if not complete, story. Reflecting on just the pooled results, the more secular a society becomes (i.e., higher values of TradAgg) the less inequality there seems to be. On the other hand, whether a society is collective or not doesn't affect inequality on its own, but the interaction with TradAgg is significant and close in value in both pooled cases, meaning the marginal effect is conditional upon the value of one of these variables (see equations 2 and 3 earlier). All that said, at this point it does not seem as though either the high- or low-income group is driving the results in the pooled regressions.

Like the pooled results, a more secular, high-income society has lower inequality, but unlike the pooled results, the SurvSagg coefficient is significant and negative, indicating that individually focused societies have lower inequality. In other words, high income countries that are secular and individually focused have lower inequality (on average) than countries that are more traditional and collectivist. Unlike the pooled results, the two are not dependent upon one another as the interaction's coefficient estimate is insignificant.

None of the variables seem to correlate with the Gini coefficient for lower income countries, however, the interaction is 'almost' significant with a p-value of 0.106. This may indicate that although the static coefficient estimate is marginally insignificant, the dynamic estimate from equations (2) and (3) may be significant in various regions of TradAgg and/or SurvSagg. We graphically explore these below.

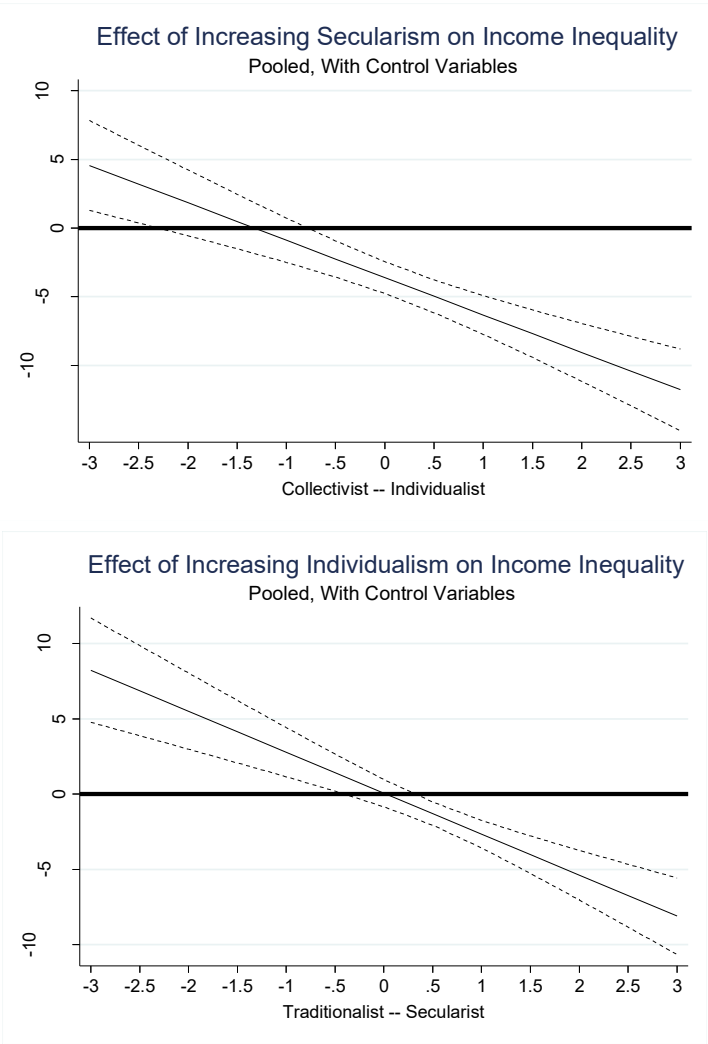
Graphical Results

The graphs below depict the estimates of the marginal effects in (2) and (3) when conditioned on the control variables.

The left-hand graph in Figure 2 shows the marginal effect of TradAgg on the Gini coefficient for the pooled group. The horizontal axis ranges from -3 to 3 as societies move from highly collectivist to highly individualist, respectively. The solid horizontal line delineates a zero marginal effect while the two curved outside lines are the effect's 90% confidence interval. The darker line inside the confidence interval is the estimated effect itself; it is significant if the lower/upper bound of the confidence interval is above/below the horizontal line, otherwise, the effect is insignificant.

We see the effect TradAgg has on the Gini coefficient is positive and significant for those countries that are highly collectivist indicated by a SurvSAgg score of less than -2.5, with the effect becoming insignificant as we move rightward through the scale up to about -0.75; after that the effect becomes negative as societies become more individualist. This means that, on average, as countries increase their level of secularism (i.e., have higher TradAgg scores), they will have increasingly lower inequality if they embrace a more individualist culture, and vice versa. On the other hand, increasingly secular but highly collective societies will have higher levels of inequality. In the 'middle' of all this are the moderately collectivist countries that can increase their secular behavior yet have no significant effect on inequality. Overall, implementing policies in more secular societies which reward entrepreneurship, thereby pushing that culture toward more individualism, will result in lower levels of inequality, and vice versa.

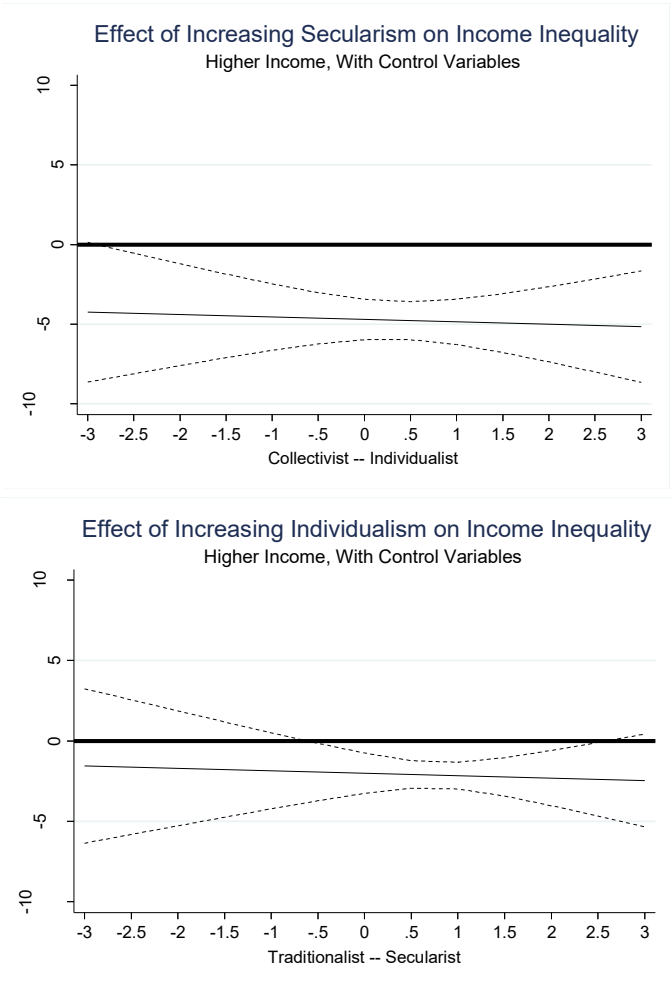
Figure 2: Pooled Countries



The right-hand graph in Figure 2 shows the marginal effect of SurvSAgg on the Gini coefficient for the pooled group. This graph indicates that societies who are increasingly individualist, yet more traditional, will see greater inequality while those that are more secular will see lower inequality. Again, implying that policies directed toward the individual and success of secularism will lower inequality, while those policies that are directed away from these values will see the opposite effect.

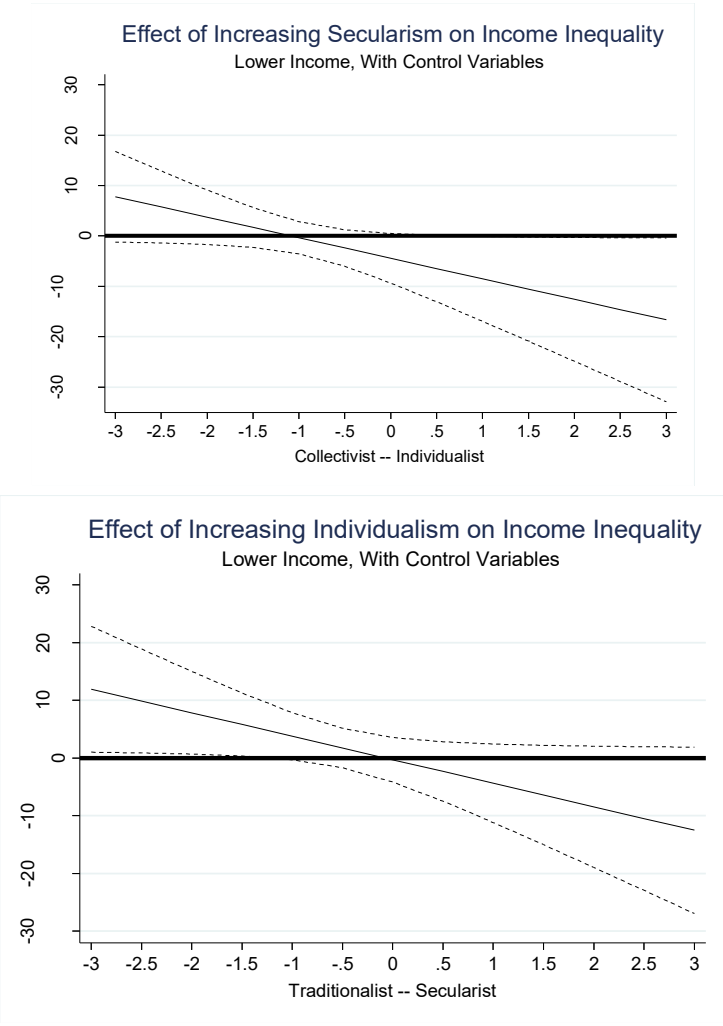
The results in Figure 3, reflecting higher income countries, tell a less complicated story. The left-hand graph tells us that countries embracing more secularism will realize lower inequality than those with traditional cultures, regardless of whether they are collective or secular, and vice versa. Furthermore, the size of the effect on the Gini is fairly constant at roughly -5.0, meaning that every one-point increase in the TradAgg variable results in a five-point decrease in the Gini coefficient. The policy implications of this outcome would likely mirror those for the pooled outcome(s).

Figure 3: Higher Income Countries



The estimates in the right-hand graph are just as constant, but the statistical significance varies. Countries that embrace the individual will only realize a significant reduction in the Gini coefficient if they are secular (for the most part), while mostly traditional societies realizing no significant change. On the other hand, more collective and secular countries will see higher inequality. Again, in these higher income economies, policies that affect the individual in a secular setting are likely to have the greatest effect on equality.

Figure 4: Lower Income Countries



With Figure 4, it becomes clear that the pooled results are largely driven by the lower income countries. In short, increasing secularism (left-hand graph) will reduce the Gini coefficient only if that culture embraces individualism, but collective cultures will see no effect. And those countries that increasingly embrace the individual (right-hand graph) will realize higher inequality in traditional cultures, but secular societies will see no significant change. It seems, then, that there is only a small margin for influencing

inequality in these nations as much of the effect(s) is insignificant across the values of the other variable, but it can be done; the policies would most likely have to be more focused than they would otherwise need to be for higher income nations, however.

Policy Implications

The policy implications of our analysis are quite clear. Let us first assume that a government's objective is to lower the levels of inequality in their country; this may be an altruistic assumption for sure as this may not be the objective of authoritarian regimes, but let's just assume that it is. Second, reflecting upon the definitions from earlier, let us assume (economically speaking) that individualism and secularism embrace a more entrepreneurial spirit, while traditionalism allows for wealth creation in the family and apart from the rest of society (e.g., familial entrepreneurialism), and collectivism retards individual and/or familial wealth creation in favor of communal 'equity'.

If these assumptions are true, this country will first have to determine whether it falls into the lower or higher income categories, then it will have to determine what its cultural philosophy is--traditional, secular, collective, or individual (perhaps by using Figure 1). A higher income society, whether collective or not, will realize lower inequality by embracing a more secular standard, perhaps by loosening restrictions on public discourse, freedom of thought, individual rights, etc. A mostly secular higher income society will benefit most by embracing a more individualist standard, and likely benefit from increasing small business tax breaks, easier access to small business loans, more research and development grants, enforcement of patent laws, enhanced private property rights, etc. On the other hand, a lower income country that recognizes the individual as a major economic player, will benefit most by embracing a more secular standard (perhaps employing the same incentives as above); and if the country is traditional in nature, it will realize lower inequality by implementing policies that embrace more collective economic norms, such as 'free' health care and schooling, income redistribution policies, community engagement activities, etc. Therefore, any policy governments employ to address inequality should be viewed through the lens of research such as ours for the policies themselves to have the desired effect.

5. Conclusion

We began this research with two objectives: using the World Values Survey, exactly how does a society's culture affect income inequality, and do these values interact with one another to complicate the inference drawn from these marginal effects.

Realizing that many of the existing theories and policies addressing inequality must take into consideration a nation's cultural values for them to be effectively employed, it is important for governments and researchers to view such policies through the lens of the values their constituents embrace; to ignore this would likely reduce the effectiveness of the policy itself, meaning that the desired outcome (usually in the form of lower inequality) may not be fully realized.

We found that in order to lower inequality, higher income nations should implement policies that support individualism and secularism in that country, regardless if they are collective or traditional. In other words, collective policies such as income redistribution, free education and health care, etc., may not be as effective in reducing inequality than

policies expanding entrepreneurship, expansion of businesses, and wealth creation. To a great extent, this supports the downward portion of Kuznet's hypothetical relationship between inequality and income, that is, as economies grow richer, inequality will fall as resources are more abundant and fluid, and investment grows.

On the other hand, analysis of the lower income results is more complicated, but clear nonetheless. Lower income, individualist countries will realize lower inequality by embracing policies that enhance secularist ideals, however, collectivist nations will likely realize no real benefits from these same policies. Traditionalist societies, on the other hand, should be able to realize the same effects by enhancing the collective nature of the population, while secular countries will likely see no effect from those same policies.

In short, without viewing national policies that address inequality through the lens of their respective cultural values and norms, governments will likely continue to see very few significant and favorable results from their efforts. We have shown that it is possible to more narrowly tailor policy prescriptions to get the most out of their efforts.

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Sources of data:
WVS

Annex:

avg_mean_ tradagg	avg_mean_ survsagg	avg_mean_ gini	country code
0,340677	-0,91253	27	ALB
-0,38669	0,185619	45,67881	ARG
-0,04292	-1,08753	30,82	ARM
0,031993	2,110685	34,43889	AUS
-0,40644	-1,17018	26,6	AZE

-1,24027	-0,77378	43,3	BFA
-1,31733	-0,83532	29,85	BGD
1,06423	-1,08423	25,45	BLR
-1,23427	-0,35722	47,025	BOL
-0,77207	-0,21837	56,24995	BRA
-0,27118	1,65943	32,855	CAN
0,593141	1,400572	33,9	CHE
-0,55671	-0,13997	52,37333	CHL
0,706166	-0,33842	40,28333	CHN
-1,718	0,218783	53,96111	COL
-0,39946	-0,24508	31,60333	CYP
1,169208	0,807489	25,65	CZE
1,270658	1,355058	30,265	DEU
-1,00796	-0,12072	51,4	DOM
-1,04875	-1,03242	35,3	DZA
-1,73237	-0,06838	48,46	ECU
-1,49679	-0,67132	30,1	EGY
0,168818	0,612521	34,17567	ESP
1,419255	-0,59501	32,32	EST
-0,97881	-0,81421	31,55	ETH
0,523316	1,392577	26,53333	FIN
0,603312	1,439814	31,03333	FRA
-0,16685	1,848482	36,48333	GBR
-0,57283	-1,28173	38,10167	GEO
-1,84846	-0,79404	42,8	GHA
0,275632	-0,23952	35,5	GRC
-1,27776	-0,16542	58,95	GTM
0,758295	-0,21904	29,9	HUN
-0,84503	-0,97146	33,82444	IDN
-0,47449	-0,37515	33,525	IND
-0,56269	-0,90098	38,1	IRN
-0,85683	-1,34874	28,6	IRQ
0,202769	0,579754	38,1	ISR
-0,14605	0,456143	34,83333	ITA
-1,53914	-1,34423	35,0875	JOR
1,584984	0,658969	33,65	JPN
-0,21657	-0,67018	29,51	KAZ
-0,62945	-0,78159	30,48	KGZ
1,182371	-0,32395	31,8	KOR
-0,33315	-0,97547	31,8	LBN
1,570641	-0,45515	34,25	LVA
-1,08735	-1,48751	40,7	MAR

0,819	-1,62297	33,98889	MDA
-1,10769	0,20765	50,96905	MEX
0,436679	-0,6589	35,05	MKD
-1,38584	-0,08836	39,9	MLI
-0,54136	-0,49283	45,43889	MYS
-1,42696	-0,89237	44,65	NGA
-1,72079	-0,32305	46,2	NIC
0,631546	1,873796	29,055	NLD
0,858982	2,263104	27,03333	NOR
-1,28471	-0,85707	32	PAK
-1,04897	-0,44222	48,91333	PER
-1,24369	-0,18605	45,675	PHL
-0,60159	-0,07504	36,14	POL
-0,31344	0,136443	35,35	PRT
-0,94429	-1,34507	34,7	PSE
-0,06849	-1,10482	36,195	ROU
0,80032	-0,939	38,22334	RUS
-1,20101	-0,89902	50,25	RWA
0,667621	-0,41348	39,80833	SRB
0,492134	0,136215	25,85	SVK
0,882999	0,592865	24,59	SVN
1,184095	2,474006	26,236	SWE
-0,22659	-0,07441	40,61667	THA
-0,73443	-1,55695	36,75	TUN
-0,82528	-0,6131	40,47778	TUR
-1,16748	-0,88565	41,4	UGA
0,609616	-1,01602	27,56167	UKR
-0,25823	0,743916	43,42667	URY
-0,6376	1,41404	39,24778	USA
-1,77331	0,062942	48,125	VEN
-0,5768	0,25324	35,86667	VNM
-1,38282	-1,23182	34,7	YEM
-0,81755	-0,29706	61,3	ZAF
-0,52909	-0,90108	48,2	ZMB
-1,03382	-1,45745	43,2	ZWE

Source: Elaborated from the international sources cited in the text.