Inequality and Global Life Satisfaction

by

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Abstract

Using Survey Data from Veenhoven's World Happiness Database we study the relationship between income inequality and happiness in over 100 countries from the years 1980 to 2013. We find that the Gini is infrequently an important predictor of wellbeing in our cross-country regressions, after controlling for Gross National Income per Capita, Unemployment and other economic characteristics. The strength of the relationship, however, varies tremendously between countries and the regression coefficient is not consistently positive or negative. In general we can make no claim that there is a definitive relationship between inequality and wellbeing. In most cases, Gross National Income has a stronger relationship with happiness than inequality, and Standard Deviation of Temperature is also informative in predicting levels of wellbeing. These findings indicate that inequality should enter into policy considerations to a lesser extent than absolute income, and depending heavily on the year and country observed.

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I. Introduction

Inequality has been an incredibly popular topic of discussion among policy makers, academics and the general public, but is it as harmful as often claimed? The attention inequality has received in recent times is due in part to Thomas Piketty's *Das Capital*, where he argues that so long as the rate of return of capital is greater than the rate of growth of an economy, inequality will continue to rise unimpeded.[1] To combat this rise, Piketty has suggested a coordinated effort to impose a global tax on capital. But what level of inequality should a country aim for? How destructive is inequality, and how should we measure its consequences?

If Piketty is correct, then higher levels of inequality should lead to suboptimal outcomes within a nation. Traditionally, economists have studied inequality and its impact in terms of *economic growth*. For example, Aghion, Caroli and Garcia-Penalosa 1999 have found that higher inequality leads to lower levels of economic growth and investment opportunities. Likewise an OECD 2014 study showed that the recent widespread increases in income inequality have led to slow downs in economic growth.[2] Figure 1 shows OECD estimates for the negative impact of rising inequality.

This thesis, however, intends to examine the relationship between inequality and *Life Satisfaction* with an empirical analysis covering more than 100 countries from the years 1980 through 2013. This will hopefully allow us to move beyond the results of previous studies that are only relevant for a given country or year and say something about inequality and happiness in general. Some may question the use of subjective wellbeing data, but the United States, France and countless other nations have established securing happiness for its citizens as one of the fundamental roles of government. While

economic growth is often used in policy decisions, it seems intuitive that growth should be pursued by nations only as long as it improves the wellbeing of its citizens. So, including a Life Satisfaction analysis as part of the academic discussion of inequality seems appropriate and useful.

i) The Easterlin Paradox

The Easterlin Paradox is a central theme within happiness economics and is named after economist Richard Easterlin, who first mentioned it in 1974.[3] It initially referred to two phenomena:

1) Higher absolute incomes do not lead to happier citizens within a given country over time
2) High-income countries do not have higher reported happiness than less those less well off

The first of these phenomena may be explained by the importance of relative income, in that citizens are not necessarily much happier with increases in income so long as their peers' incomes are still higher. One of the most frequently cited examples of this first phenomenon is the United States, where happiness has stagnated despite an average growth rate of about 4.5% in GDP per Capita over the last twenty years. Inequality has also been the rise in the United States, the Gini Coefficient increasing from 0.35 to 0.44 in the last 30 years or so. It will be interesting to see whether inequality had a large role

in the stagnation of life satisfaction within the United States, or whether other factors are to blame. Figure 2 shows the evolution of the Gini Coefficient from 1913 through 2009.

This paper will begin by examining some of the previous literature on inequality and happiness, and will perform regressions similar to those done earlier with a broad range of countries over a twenty-year time span. While many previous studies have examined the relationship between inequality and wellbeing within a given country or for a certain year, this paper presents a more exhaustive analysis in that we use data on over 100 countries for our cross-country analysis and present time series regressions for 10 separate nations. Time series regressions will be presented first for selected countries, and then the results of our cross-county regressions will be discussed afterwards. Control variables will be input so that the effect of inequality can be isolated from the variation caused by other external factors. Finally, I will offer some thoughts on policy implications and suggestions for potential future research.

II. Inequality and Happiness: Literature Review

II. i) Wellbeing and Previous Empirical Work

Wellbeing is inherently less quantifiable than economic growth or GDP, but it is perhaps more democratic a measure as it allows each individual the "right to decide whether his or her life is worthwhile." Thus wellbeing is an important variable to look at wherever the opinions of individuals are respected (Diener 2000).[4] Happiness has long been a focus of psychological study, but thanks to Ed Diener and his proposal for a

National Index governments and academic institutions have granted subjective wellbeing (SWB) more validity in economic decision-making.

Empirical work on happiness has found several variables that are correlates of happiness. Argyle 2003 uses Cantril's survey of 23,875 people in 11 countries along with Eurobarometer data to examine 18 potential correlates and finds that marriage is one of the strongest predictors of SWB.[5] Furthermore Blanchflower and Oswald 2000 performed a time series analysis of Britain and the United States and found that women, married people and those without divorced parents are happiest.[6] Education, when controlled for occupational status and income, has not been found to have a clear association with SWB[7], although Yakolev 2012 finds that higher education does have a non-monetary effect even after including appropriate controls.[8] Finally, Tella, MacCulloch and Oswald 2001 study a regression of the below form to prove that inflation and unemployment both have significant statistical relationships with wellbeing, but that unemployment is 1.7 times more costly.[9] They tested their hypothesis using the following regression model:

$$LS_{it} = \alpha\, INF_{it} + \beta UNEMP_{it} + \varepsilon_i + \delta_t + \mu_{it}$$

Where LS is the mean residual average life satisfaction not explained by a variety of demographic characteristics, UNEMPit is the unemployment rate is the unemployment rate in country i in year t, INF is the rate of change of consumer prices in country i and year t, εi is a counry fixed effect, δt is a time effect, and μit is an error term.

Note that there has been no strong evidence of causality in most of these studies, as it may be the case that happier people are more likely to get married, remain employed, etc. Clark, Diener, Georgellis and Lucas 2008 have found 5 major life events (including marriage and childbirth) to have non-significant effects on happiness a few years after occurrence, suggesting reverse causality may play a role in a number of the SWB associations.[10] The only exception is unemployment, which was found to cause significant and non-temporary decreases to life satisfaction after the event. However, it is not within the scope of this paper to prove causality, merely to determine whether there is an association between inequality and happiness. Figure 3 shows wellbeing in the years before and after life events as a result of their study.

II. ii) Inequality as Correlate of Wellbeing

Easterlin and his famous paradox likely marked a starting point for the body of academic work focusing on the relationship between wellbeing and income inequality. While his initial results showed a non-significant relationship between inequality and wellbeing in cross-country regressions (only including countries with enough GDP per capita to satisfy basic needs), absolute income is now no longer doubted as an important correlate of happiness. For example, Stevenson and Wolfers 2008 used the 2006 World Gallup Poll and World Values Survey to show that GDP per Capita is very highly predictive of happiness, with a correlation exceeding 0.8.[11] Figure 4 shows Stevenson and Wolfer's regression results.

However, Easterlin's finding that happiness does not rise with higher incomes *within* a country over time has been a source of greater contention, and has lead to a

closer examination of income inequality as a potential determinant of subjective wellbeing. The body of research on this topic is still relatively small, and has returned mix results. Helliwell 2003 regresses international happiness data from the World Values Survey against a number of individual and societal variables and found that including World Bank Gini data adds no predictive power to the wellbeing equation.[12]

On the other hand, Schwarze and Härpfer 2005 use longitudinal data beginning in 1985 to find that Germans are inequality averse – life satisfaction as measured by the German Socio-economic Panel Study tends to decline in times of greater inequality.[13] The Schwarze study is interesting because it uses post-government income inequality, which is potentially more desirable than unadjusted inequality data because it describes the inequality that is actually experienced by a country's citizens.

Schwarze uses a regression equation similar to those we have seen before:

$$S_{irt} = X'_{irt}\beta_1 + Y'_{irt}\beta_2 + IPOST_{rt}\beta_3 + \mu_r + \nu_t + \alpha_i + \varepsilon_{irt}$$

"Life satisfaction, S, of person i in region r at time t can be explained by a vector of individual socio demographic characteristics, X, and by information on individual income and the relative income position, represented by the vector Y. In addition, the model includes a measure of post-government income inequality (IPOST). The coefficient vectors to be estimated are denoted by β ; μ r is a fixed effect for the region in which the individual lives, ν t is a fixed time effect, αi is an unobserved individual effect, and irt ε is an error term."[14]

Alesina 2004 is another time series analysis that compares the United States with Europe and returns a few interesting results.[15] First, they find that individuals tend to have lower reported happiness levels in times of high inequality even after controlling for income and various personal characteristics. An unexpected finding is that it is the wealthy in the U.S. who are unhappy about inequality. The relationship between inequality and life satisfaction was found to be stronger in Europe, but is the poor and more liberal citizens who are unhappy about inequality.

The Schwarze and Alesina studies, both time series regressions, and Helliwell's cross-country analysis seem to suggest that inequality may be more important as a predictor of happiness over time *within* a country than as a predictor of happiness *between* countries.

This thesis will present comparisons of the cross-country and inter-temporal regressions, and will expand on some of the previous studies by using available panel data of 100+ countries over a 30 year time period. This will hopefully allow us to see a more complete picture of the inequality-wellbeing relationship and whether it changes over time or by over different countries. In what follows I will detail the data and the methodologies used for the study.

III. Life Satisfaction Model

III. i) Description of Data

Happiness:

The Cantril Self Anchoring Scale is a well known numerical measurement of wellbeing based on survey responses, which asks the following:

- *Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top.*
- *The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you.*
- *On which step of the ladder would you say you personally feel you stand at this time? (ladder-present)*

Data were taken from the World Database of Happiness, directed by Ruut Veenhoven of the Happiness Economics research Organization. The database contains information on 155 present day nations with data beginning in 1970, with data availability varying significantly between countries. Life Satisfaction tables 121C and 122F were used. Table 121C asks subjects to rate their life satisfaction as either very satisfied, satisfied, dissatisfied or very dissatisfied. Veenhoven transforms these data from a 4pt scale to a 10pt Cantril scale value. Surveys used in Table 122F were based on a 10pt scale originally.

Gini Coefficient:

The Gini Coefficient is based on the Lorenz curve and is the most commonly used measure of income inequality. The Gini score measures the degree to which a country deviates from perfect equality: a Gini of one (100%) represents maximum inequality whereas a score of zero describes perfect equality.

The Standardized World Income Inequality Database covers 174 countries and 4631 country years, offering "the broadest sample of countries and years." It is designed to maximize the comparability of inequality data between different sources, over time and between countries. The SWIID includes data from "the United Nations World Income Inequality Database, Socio-Economic Database for Latin America and the Carribean generated by CEDLAS and the World Bank, EuroStat, the WorldBank's PovcalNet, and others. Data from the Luxembourg Income Study is used as the standard. Gini values are netted of government distributions so as to offer a better picture of the level of inequality citizens within a country actually experience.

III. ii) Controls:

Human Development Index (HDI):

The Human Development Index was created by the United Nations as a way of assessing countries based on "the key dimensions of human development," and includes health and education components in addition to a standard of living dimension. It covers 195 countries, with data beginning in 1980. The health component is measured by life expectancy, capped at 85 years and with a minimum value of 20 years. Education is evaluated by "mean years of schooling for adults aged 25 years and expected years of

schooling for children of school entering age." The standard of living dimension is measured by gross national income per capita. The three major components (health, education, and standard of living) are then aggregated into a composite score using geometric mean.

Inflation and Unemployment:

These data were gathered from the International Monetary Fund (IMF) under the World Economic Outlook Database. Inflation here is measured as the average rate of inflation in consumer prices over a given year, while unemployment is simply the percentage of the total labor force that is without a job. Data is available for 189 countries from the years 1980-2013.

Crude Marriage Rate:

Marriage Data are taken from the United Nations Populations Division and the UN Monthly Bulletin of Statistics versions April 1991, July 1996 and April 2001. Crude marriage rate is expressed as marriages per 1,000 population and data is available for 180 countries or areas. Populations Division Data is presented for five reference dates: the closest years to 1970, 1985, 1995, and the two most recent years after 1999. Monthly Bulletin Data are available for about 20 countries from the years 1991-2000.

Temperature:

Often overlooked in such analyses, temperature has been shown by Rehdanz and Maddison 2003 to be significantly associated with life satisfaction even with the

inclusion of several other economic and demographic variables. Data is taken from the World Bank Climate Change Knowledge Portal and available for 178 countries. Values are calculated as Celsius averages from 1961-1999 and these are assumed to be unchanging over time, so the effects of recent climate change are ignored. Temperature data is therefore only used as a control for cross-country regressions. Standard deviation is calculated based on monthly average temperature data.

Summary statistics are presented below in Table 1. In the following sections I will detail the hypotheses I am testing and present regression results for cross country data. Then I will discuss the implications on inequality as a contributor of happiness and wellbeing between nations. Afterwards, I will look at time series data for a few selected nations.

III. iii) Cross-Country Analysis

Drawing from these data sources, we will test a multivariate wellbeing model of the following form:

$$SWB_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots \beta_n X_n + \varepsilon$$

where SWB_i represents the average level of subjective wellbeing for a given year. X_1, X_2, … Xn are the explanatory variables taken from a given country for that year, and α is an intercept term. ε is an error term. β_1, β_2, … β_n are coefficients to be estimated.

Our data allows us to look at the years 1981, 1990, 1995, 2000, 2005 and 2010. It is important to note that the sign of the regression coefficients should be taken with a

grain of salt, in that a negative coefficient need not necessarily mean that the variable is negatively correlated with happiness. A negative sign merely means that the predictor moves oppositely with happiness *given* the presence of other variables. For example, life expectancy often has negative regression coefficients and yet is positively associated with wellbeing when regressed on its on.

The high Variance Inflation Factors for Gini, GNI/ Cap and Mean Years Educ. suggest that there may be issues with multicollinearity in the model with all available controls. Simple scatterplots show that the Gini Coefficient is related to both GNI/ Capita and Mean Years Education, where countries with higher Gini values tend to have lower per capita Gross National Incomes as well as Mean Years of Education values. This result is interesting, and affirms the conclusions found by the 2014 OECD study. For this reason, we compute two separate models: a full model with all 8-control predictors alongside the Gini as our main explanatory variable and a model with 3 control variables. For the most part, the results of the 4-predictor model has been chosen for discussion purposes as it has removed redundant predictors but still retains enough controls to be useful. The results of this analysis are given in Table 2.

Carrying out our analyses with the available data, we observe that inequality does not do a good job of predicting wellbeing in 1981 but does attain significance in 1990, 1995, 2000 and 2005. Looking at the 1995, 2000 and 2005 results, we find the Gini is significant at the 5% level, while it was significant at the 10% level in 1990 with a p-value of 0.091. The R^2 of these years are also higher than the 41.30% found in 1981, meaning our model becomes better at explaining the variation of happiness over time. However, in 2010 the Gini no longer retains significance with a p-value of 0.201

although R^2 is still moderately strong at 57.79%. Unemployment instead takes on significance at the 5% level, with a p-value of 0.049. It is non-obvious why this is true, although the weaker predictive power of the Gini in 2010 may have something to do with the impacts of the global financial crisis that began in 2008 and the increased media focus on unemployment as a sign of economic health.

It is also interesting to see that the predictors vary significantly in their contribution to happiness over the years. For example, the marriage rate of a country is relatively important as a correlate of happiness in 2010 but not so much in 2005. It is unknown whether this is due to changes in the determinants of happiness or random chance. General exceptions to this are the Temp Std. Dev and GNI/ Capita variables, which seem to be consistently important in determining the average happiness levels within countries.

Although there is much variation between years, we observe that the Gini is generally of secondary importance to absolute income measures as a correlate of subjective wellbeing. Gross National Income per Capita is more predictive of wellbeing than the Gini Coefficient in four of the six years observed, confirming the Stevenson and Wolfers 2008 results in their reexamination of the Easterlin Paradox. However, it is obviously a mistake to dismiss the Gini and its impact on happiness, as it has often achieved significance and to a greater degree than inflation and unemployment. We will now examine happiness over time *within* a few selected countries to see if this brings any more light to inequality's role in determining average life satisfaction.

III. iv) Within-Country Analysis

Our data allows us to run regressions for 10 countries over time. We use the 9 predictor and 4 predictor models discussed earlier, but also include an additional model with only Gross National Income per Capita as a control variable. Here we find that the Gini coefficient is a significant predictor at the 5% level for 3 out of the 10 countries analyzed in our 4-predictor model, which is again our default model and will be the model referred to in our results unless stated otherwise. The governments of the United Kingdom, the United States and Greece have reason to give special attention to the inequality level within their country for this reason, while in other countries there seems to be less evidence that inequality deserves as much a role in policy considerations. It is interesting that inequality should be a significant predictor in the United States and the United Kingdom, because social mobility is often perceived to be high within these countries, and mobility has been thought to increase a country's tolerance of unequal incomes.[16] Results of this analysis are presented in Table 3. In what follows we present a short discussion of the results for each country and the implications on inequality and happiness.

Belgium:

We have 17 years worth of data for Belgium beginning in 1990. The results of the regression show that the Gini is not an incredibly important predictor of happiness within the country. GNI per Capita is the most significant predictor, with a p-value of 0.016 in our four-variable model. Marriage rate is also an important determinant in this model,

significant at the 1% level, but unemployment does not seem to add much predictive power given the other variables.

Costa Rica:

There is only 8 years worth of complete data for Costa Rica, and thus it is more difficult to find significance in any of our predictors. However the R^2 is still relatively high at 69.39% in the four-variable model, meaning the model is still useful in predicting satisfaction levels for Costa Rica over time. Marriage rate attains the highest P-value at 0.15.

Finland:

We have 13 years of data for Finland and we find that GNI per Capita is the most important correlate of happiness, with a p-value of 0.057 in our 4-predictor model. All other predictors are non-significant, although unemployment comes close with a p-value of 0.142. The R^2 of the model is 75.39%.

France:

Gross National Income per Capita and Unemployment seem to be by far the most important correlates of happiness in France, both significant at 10% levels and unemployment significant at the 1% level. All other predictors were non-significant, and the overall R^2 is relatively strong at 65.74%.

Greece:

In Greece the Gini was found to be the most highly correlated predictor of Happiness, with a P-value of 0.052. This is significant, although the R^2 of our 4 predictor model was relatively low at 33.23% Thus the Gini should be considered a significant predictor of Happiness in Greece but its predictive power is not incredibly reliable.

Japan:

In Japan we find that none of our predictors were significant, which may be due to a lack of data availability with only 9 years of data. The low significance of GNI/ Cap variable is surprising, potentially suggesting a closer look at cultural or political factors as determinants of Japanese life satisfaction.

Netherlands:

There are 20 years worth of data for the Netherlands, and we find that marriage is significant (at the 10% level) and but that none of our other predictors were significant. Gini is decidedly non-significant, and the R^2 of our model is 75.32%, which is relatively strong.

Portugal:

In Portugal we find that the Gini is an important predictor of happiness in the two predictor model, with p-value of 0.105, but it is non significant when more predictors are included. In general we conclude that the Gini should not be considered a reliable

measure of happiness in Portugal. The R^2 is relatively strong at 71.75% for the 4-predictor model and 68.09% for the 2-predictor model.

United Kingdom:

In the United Kingdom GNI/ Capita is the best predictor of SWB, with a P-value of 0.019 in the 4-predictor model. In fact all of our predictors were significant in this model at the 5% level, except for unemployment, which had a p-value of 0.06. The four variables explained a large amount of the variation in happiness (R^2 = 84.20%).

United States:

The United States frequently comes up in studies in inequality, and here we find that the Gini is a significant predictor of happiness with a p-value of 0.025. It is the most significant predictor, which is quite interesting as inequality is of secondary importance to absolute income measures in most cases. Unemployment was also close to significance at the 10% level with a p-value of 0.105. Finally, the R^2 of our model is quite strong, at 85.82%.

IV. Summary of Results

For our cross-country data, there seems to be reasonable evidence of an association between inequality and happiness after including appropriate controls, with the Gini significant for the years 1990, 1995, 2000 and 2005. And although the influence of inflation and unemployment is sometimes observed, we do not find that these two

variables add much predictive power to the model after other appropriate predictors are included.

The time series data give interesting results, and in general we can say that the predictors vary tremendously in their ability to predict subjective wellbeing between countries. For most countries analyzed we found that Gross National Income per Capita was a much better predictor for happiness, confirming the Stevenson and Wolfers 2008 conclusion that absolute income is of higher importance than relative income measures in predicting life satisfaction. However, the Gini was a significant predictor of SWB in the United States, the United Kingdom and Greece at the 5% level. It is also interesting that inequality was a *better* predictor of SWB than GNI/ Capita for the United States. Therefore within the U.S. there seems to be a much higher societal cost of increasing inequality than we see elsewhere. In general, we say that it would be a mistake for all nations to rule out the importance of inequality without taking a closer look at their own data.

V. Conclusion and Suggestions for Future Research

We rely on survey data and the ability of citizens to evaluate their current wellbeing as evidence of the damage, or lack thereof, that inequality causes a country. The results of our analysis show that the determinants of happiness vary tremendously between countries, and so it is important for any governing body to look into its own data when making policy decisions on inequality. In the United States, the United Kingdom and Greece, where the Gini was found to have a statistically significant impact on

happiness, measures to curb inequality might be useful in making improvements to the wellbeing of citizens.

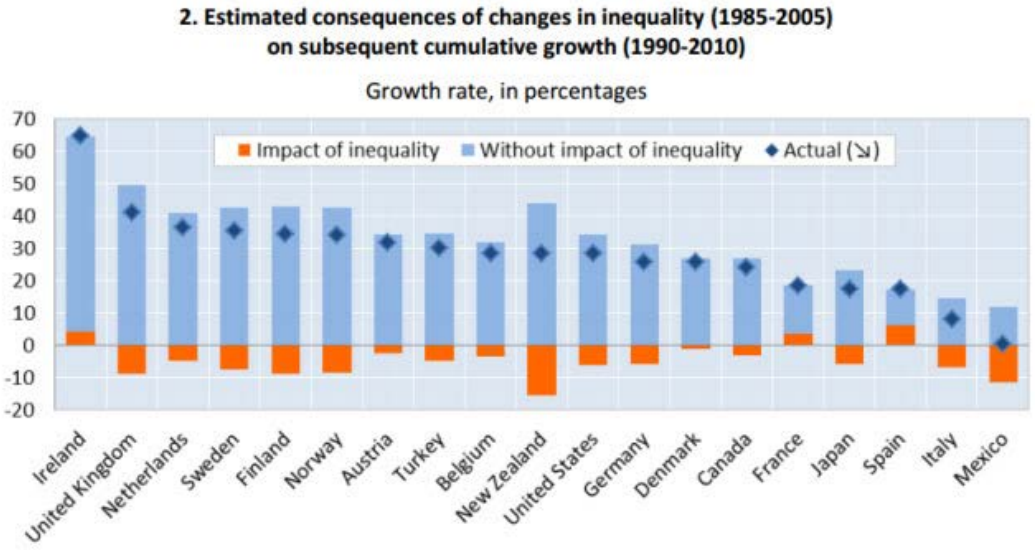
In general, the Gini is an important predictor of international subjective wellbeing but less so than Gross National Income per Capita, meaning that it may not be appropriate to sacrifice higher economic growth for more equal incomes. It would be interesting to see what is responsible for determining a country's tolerance of inequality relative to other nations, and the data collected here may be helpful in doing so.

This study did not pay attention to the demographic differences between countries, and so it would be interesting to see if certain racial groups, age groups, genders, etc. have different preferences for inequality. Cultural factors may also play a role, so more work can be done in observing how a country's risk tolerance, degree of individualism, etc. influence its inequality tolerance. Effectiveness of administration, measured by factors such as corruption or ease of starting a business, is also worth a closer look.

Finally, since much of our analysis was limited by a lack of wellbeing data, it would be useful for more measures of happiness to be created and rigorously computed. The use of subjective wellbeing data has been increasingly accepted as an important contributor to policy decisions, and so studies of this type would benefit greatly from year-to-year data for a variety of countries in the future. Past studies have often had to rely on using only one country or year, and so better data would have a tremendous role in allowing researchers to observe differences in inequality tolerance between regions and in conducting more reliable time series studies.

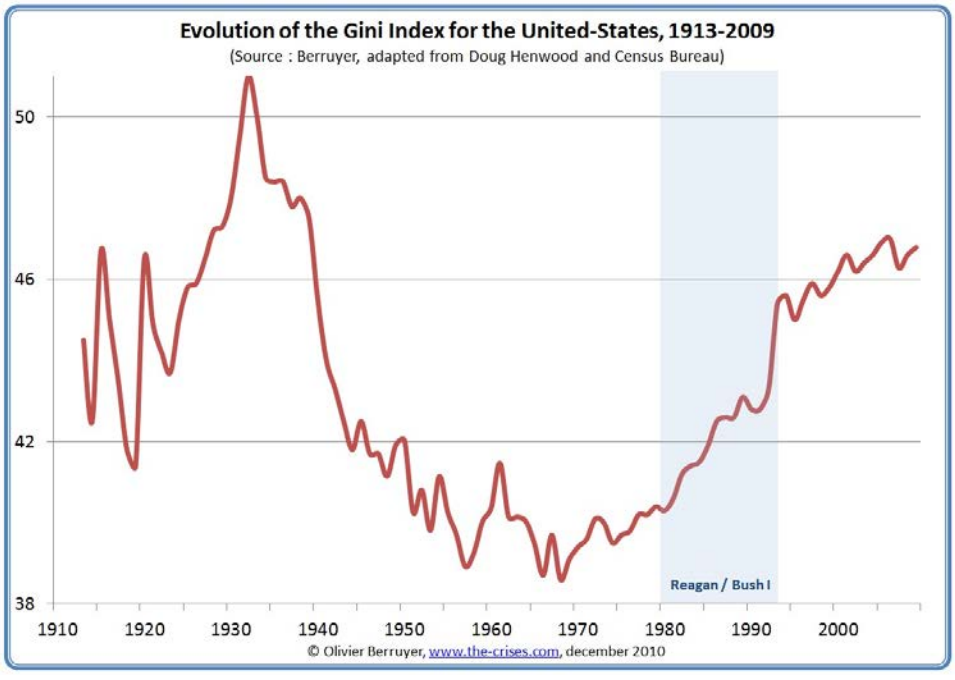
VI. Appendix:

Figure 1: Effects of Inequality on Economic Growth



Source: OECD 2014: Focus on Inequality and Growth

Figure 2: The Gini Coefficient from 1913 - 2009



Source: U.S. Census Bureau

Figure 3: Wellbeing Before and After Life Events

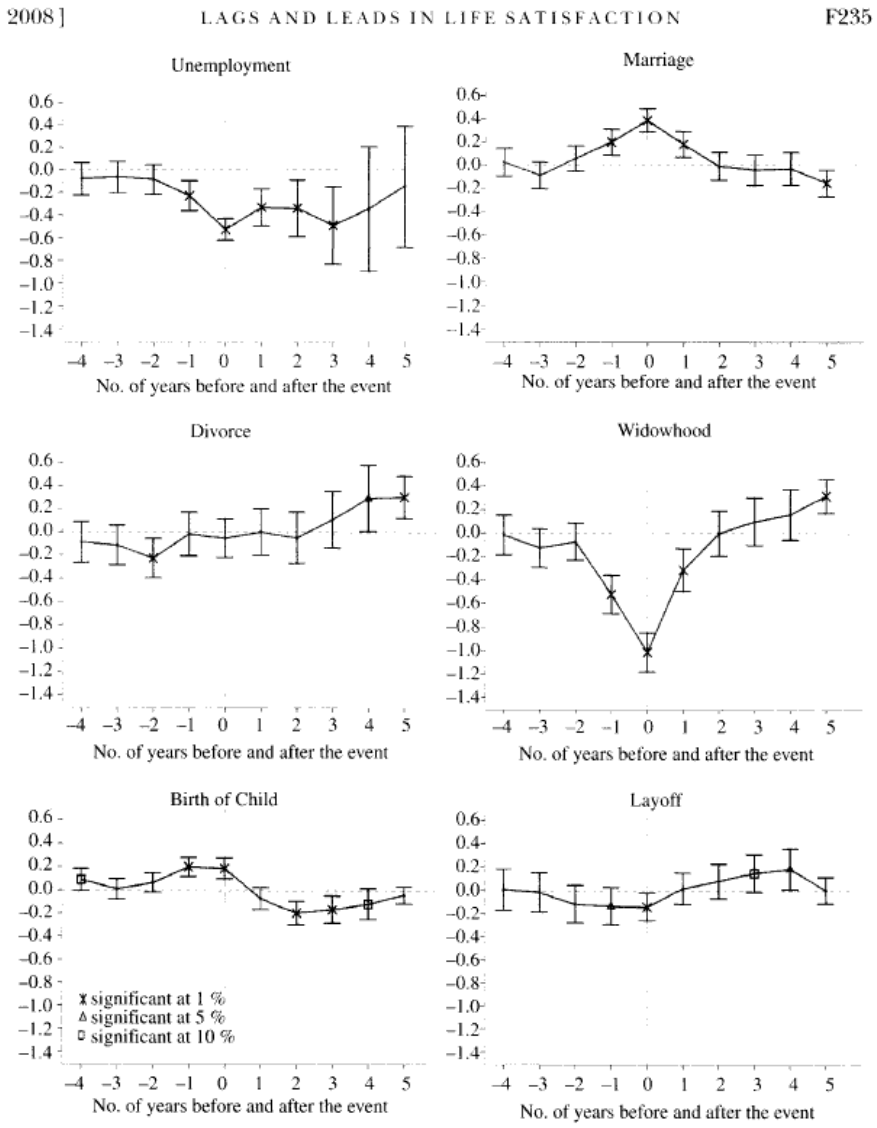


Fig. 2. *The Dynamic Effect of Life and Labour Market Events on Life Satisfaction (Females)*

Source: Clark, Diener, Georgellis and Lucas 2008

Figure 4: Stevenson and Wolfers Regression Results

Table 1. Cross-Country Regressions of Subjective Well-Being on GDP per Capita

Survey	Ordered probit regressions, micro data		OLS regressions, national data			Sample size
	Without controls	With controls	All countries	GDP per capita > $15,000	GDP per capita < $15,000	
Gallup World Poll, 2006: Ladder question	0.396***	0.422***	0.418***	1.076***†	0.348***	139,051
	(0.023)	(0.023)	(0.022)	(0.211)	(0.037)	(113 countries)
World Values Survey: Life Satisfaction						
1981-84 wave	0.525**	0.291	0.498*	1.677**	0.722	23,537
	(0.263)	(0.331)	(0.252)	(0.703)	(0.582)	(19 countries)
1989-93 wave	0.551***	0.551***	0.558***	0.504	0.391	50,553
	(0.096)	(0.096)	(0.096)	(0.467)	(0.256)	(35 countries)
1994-99 wave	0.408***	0.418***	0.462***	0.327	0.394***	65,779
	(0.054)	(0.054)	(0.051)	(0.421)	(0.084)	(45 countries)
1999-2004 wave	0.321***	0.329***	0.346***	0.455**	0.208**	94,224
	(0.041)	(0.041)	(0.046)	(0.223)	(0.090)	(67 countries)
Combined, with wave fixed effects	0.373***	0.377***	0.398***	0.477**	0.280***	234,093
	(0.038)	(0.037)	(0.040)	(0.198)	(0.073)	(79 countries)
World Values Survey: Happiness						
1981-84 wave	0.650***	0.523***	0.569**	1.662	0.550	22,294
	(0.250)	(0.263)	(0.230)	(0.987)	(0.688)	(18 countries)
1989-93 wave	0.710***	0.725***	0.708***	0.328	0.144	49,281
	(0.130)	(0.128)	(0.123)	(0.475)	(0.309)	(35 countries)
1994-99 wave	0.319***	0.335***	0.354***	0.248	0.212**	63,785
	(0.056)	(0.056)	(0.058)	(0.235)	(0.082)	(46 countries)
1999-2004 wave	0.118*	0.138**	0.126*	0.766***†	-0.146	92,799
	(0.062)	(0.061)	(0.073)	(0.218)	(0.117)	(66 countries)
Combined, with wave fixed effects	0.229***	0.245***	0.244***	0.612***†	-0.015	228,159
	(0.055)	(0.055)	(0.063)	(0.170)	(0.100)	(79 countries)
Pew Global Attitudes, 2002: Ladder question	0.223***	0.242***	0.224***	0.466**	0.168**	37,974
	(0.041)	(0.040)	(0.041)	(0.191)	(0.082)	(44 countries)

Notes: Table reports results of regressions of the indicated measure of well-being on log real GDP per capita. Numbers in parentheses are robust standard errors, clustered by country. Asterisks indicate statistically significant from zero at the *10 percent, **5 percent, and ***1 percent level; † denotes that the coefficient estimate for rich countries is statistically significantly larger than that for poor countries, at the 1 percent level.

Source: Stevenson and Wolfers 2008

Table 1: Summary Statistics

(1980-2013) : 103 Countries Summary Statistics

Variable	Mean	Std. Dev	Min	Max	# Observations
Happiness	6.437	1.0846	2.45	9	1,104
HDI	0.72	0.15	0.21	0.94	850
Gini	33.55	10.68	0.23	0.68	2,095
GDP/ Capita ($)	18,508.00	15,264.66	162.81	113,738.73	410
Life Expectancy	74.84	8.54	43.07	83.60	1,065
Mean Years Education	9.17	3.02	1.30	16.40	1,042
GNI/ Capita ($)	17,626	14,437	160	98,880	1,044
Unemployment Rate	8.65	5.52	0.30	35.90	923
Inflation	12.68	373.27	-4.95	1620.97	942
Marriage Rate	6.01	1.73	0.50	13.00	755
Avg. Yearly Temp. (Celsius)	14.85	8.41	-7.14	28.30	96

Table 2: Cross-National Analysis: Summary of Results

Full Model

	Coefficients	Standard Error	t-Statistic	P Value
1981	0.153	0.136	1.13	0.341
1990	-0.024	0.147	-0.16	0.898
1995	0.023	0.127	0.18	0.864
2000	0.0912	0.0486	1.88	0.087
2005	-0.0288	0.0309	-0.93	0.363
2010	0.0145	0.0443	0.33	0.752

4 Predictor Model

	Coefficients	Standard Error	t-Statistic	P Value
1981	0.0079	0.0385	0.21	0.842
1990	-0.1062	0.0552	-1.92	0.091
1995	-0.1699	0.0696	-2.44	0.037
2000	0.11	0.04	2.75	0.014
2005	-0.0398	0.0175	-2.28	0.032
2010	0.0418	0.031	1.35	0.201

Table 3: Within Country Analysis: Summary of Results

Full Model

Country	Gini Regression Coefficient	t-Statistic	P-Value
Belgium	0.043	0.42	0.686
Costa Rica	-1.297	-3.19	0.193
France	-0.0113	-0.95	0.361
Greece	0.0145	1.32	0.213
Finland	0.00343	0.57	0.591
Japan	-0.36	-0.55	0.639
Netherlands	0.0024	0.39	0.762
Portugal	-0.0301	-0.46	0.659
U.K.	-0.0148	-0.81	0.503
U.S.A.	0.1059	9.55	0.066

4 Variable Model

Country	Gini Regression Coefficient	t-Statistic	P-Value
Belgium	0.0508	0.85	0.412
Costa Rica	0.106	0.78	0.481
France	0.00887	1.1	0.291
Greece	0.01852	2.17	0.047
Finland	0.00668	1.1	0.301
Japan	-0.359	-0.75	0.487
Netherlands	0.00086	0.14	0.893
Portugal	-0.0303	-1.46	0.171
U.K.	-0.01911	-2.62	0.047
U.S.A.	0.0355	3.48	0.025

2 Variable Model

Country	Gini Regression Coefficient	t-Statistic	P-Value
Belgium	-0.101	-2.46	0.027
Costa Rica	-0.0772	-1.06	0.329
France	0.00112	0.11	0.911
Greece	0.01776	2.1	0.052
Finland	0.00584	1.08	0.305
Japan	-0.0364	-0.41	0.693
Netherlands	-0.00926	-1.55	0.173
Portugal	-0.0336	-1.74	0.105
U.K.	-0.00094	-0.33	0.751
U.S.A.	0.00745	1.03	0.337

Table 3A) Belgium:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	-6.1	16.5	-0.37	0.717	
Gini	0.043	0.103	0.42	0.686	11.05
GNI/ Cap	0.000057	0.000036	1.57	0.148	18.9
Unemployment	-0.0412	-0.0972	-0.42	0.681	4.72
Mean Years Educ.	-0.813	0.536	-1.52	0.16	36.63
Marriage Rate	0.447	0.238	1.88	0.089	16.14
Life Expectancy	0.215	0.254	0.84	0.419	44.76
Inflation	-0.05	0.0948	-0.53	0.61	8.83

No. Observations	17
R Square	69.52%
R Square (adj.)	48.18%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	2.52	2.34	1.08	0.301	
Gini	0.0508	0.0599	0.85	0.412	3.65
GNI/ Cap	0.00004	0.000014	2.76	0.016	2.85
Unemployment	-0.0442	0.0486	-0.91	0.379	1.14
Marriage Rate	0.474	0.154	3.08	0.009	6.57

No. Observations	17
R Square	59.05%
R Square (adj.)	46.45%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	9.258	0.986	9.39	0	
Gini	-0.101	0.0411	-2.46	0.027	1.15
GNI/ Cap	0.00006	0.000011	0.5	0.622	1.15

No. Observations	17
R Square	29.23%
R Square (adj.)	19.79%

Table 3B) Costa Rica:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	-237.7	64	-3.71	0.167	
Gini	-1.297	0.406	-3.19	0.193	378.8
GNI/ Cap	0.00392	0.00103	3.8	0.164	278.3
Unemployment	3.243	0.804	4.03	0.155	130.92
Mean Years Educ.	14.34	4.13	3.48	0.178	649
Marriage Rate	8.99	2.2	4.09	0.784	1024.24
Life Expectancy	1.202	0.396	3.04	0.202	28.56
Inflation	-0.0063	0.0179	-0.35	0.784	3.45

No. Observations	8
R Square	98.64%
R Square (adj.)	89.10%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	-14.8	15.1	-0.98	0.383	
Gini	0.106	0.136	0.78	0.481	7.56
GNI/ Cap	0.000701	0.000537	1.31	0.262	13.44
Unemployment	0.521	0.301	1.73	0.158	3.27
Marriage Rate	1.78	1	1.78	0.15	37.94

No. Observations	8
R Square	69.39%
R Square (adj.)	38.79%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	11.52	2.67	4.31	0.005	
Gini	-0.0772	0.0726	-1.06	0.329	1.68
GNI/ Cap	-0.000144	0.000215	-0.67	0.527	1.68

No. Observations	8
R Square	41.02%
R Square (adj.)	21.36%

Table 3C) France:

	Coefficients	tandard Erro	t-Statistic	P Value	VIF
Constant	-18.1	19	-0.95	0.362	
Gini	-0.0113	0.0118	-0.95	0.361	4.72
GNI/ Cap	-0.000004	0.00002	-0.19	0.855	14.36
Unemployment	-0.0002	0.0659	0	0.997	9.8
Mean Years Educ.	-0.127	0.173	-0.73	0.478	51.55
Marriage Rate	0.533	0.358	1.49	0.164	15.18
Life Expectancy	0.297	0.255	1.17	0.268	130.6
Inflation	-0.0146	0.0462	-0.32	0.757	13.97

No. Observations	18
R Square	76.57%
R Square (adj.)	61.65%

	Coefficients	tandard Erro	t-Statistic	P Value	VIF
Constant	6.84	1.3	5.27	0	
Gini	0.00887	0.00808	1.1	0.291	1.92
GNI/ Cap	0.000022	0.000011	2.08	0.057	3.57
Unemployment	-0.0927	0.0304	-3.05	0.009	1.81
Marriage Rate	-0.126	0.19	-0.66	0.518	3.74

No. Observations	18
R Square	65.74%
R Square (adj.)	55.95%

	Coefficients	tandard Erro	t-Statistic	P Value	VIF
Constant	5.529	0.472	11.7	0	
Gini	0.00112	0.0099	0.11	0.911	1.77
GNI/ Cap	0.000022	0.000009	2.34	0.033	1.77

No. Observations	18
R Square	36.13%
R Square (adj.)	28.14%

Table 3D) Greece:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	-3.9	15.1	-0.26	0.799	
Gini	0.0145	0.011	1.32	0.213	2.58
GNI/ Cap	0.000021	0.000049	0.44	0.667	14.33
Unemployment	-0.0988	0.0785	-1.26	0.234	2.09
Mean Years Educ.	-0.077	0.313	-0.25	0.811	10.25
Marriage Rate	0.034	0.162	0.21	0.838	1.5
Life Expectancy	0.128	0.203	0.63	0.541	6.73
Inflation	-0.0088	0.0253	-0.35	0.734	4.11

No. Observations	18
R Square	37.40%
R Square (adj.)	0.00%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	4.416	0.883	5	0	
Gini	0.01852	0.00852	2.17	0.047	1.86
GNI/ Cap	0.00004	0.000017	2.32	0.036	2.12
Unemployment	-0.0755	0.0547	-1.38	0.189	1.21
Marriage Rate	0.094	0.131	0.72	0.482	1.17

No. Observations	18
R Square	33.23
R Square (adj.)	14.15%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	4.387	0.461	9.52	0	
Gini	0.01776	0.00844	2.1	0.052	1.82
GNI/ Cap	0.00003	0.000016	1.92	0.073	1.82

No. Observations	18
R Square	23.41%
R Square (adj.)	13.84%

Table 3E) Finland:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	16.35	8.07	2.03	0.089	
Gini	0.00343	0.00605	0.57	0.591	2.93
GNI/ Cap	0.000025	0.000018	1.43	0.202	25.86
Unemployment	0.01	0.0301	0.33	0.751	5.8
Mean Years Educ.	0.006	0.113	0.05	0.96	9.48
Marriage Rate	0.327	0.347	0.94	0.382	21.26
Life Expectancy	-1.53	0.121	-1.26	0.253	15.07
Inflation	-0.0585	0.0445	-1.31	0.237	1.78

No. Observations	13
R Square	86.83%
R Square (adj.)	71.46%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	4.74	1.21	3.93	0.003	
Gini	0.00668	0.00608	1.1	0.301	2.37
GNI/ Cap	0.000024	0.000011	2.18	0.057	8.03
Unemployment	0.0421	0.0262	1.61	0.142	3.53
Marriage Rate	0.186	0.245	0.76	0.467	8.5

No. Observations	13
R Square	75.39%
R Square (adj.)	64.46%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	6.17	0.261	23.67	0	
Gini	0.00584	0.00542	1.08	0.305	1.78
GNI/ Cap	0.000023	0.00005	4.25	0.001	1.78

No. Observations	9
R Square	68.07%
R Square (adj.)	62.27%

Table 3F) Japan:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	-152	117	-1.3	0.324	
Gini	-0.36	0.657	-0.55	0.639	99.04
GNI/ Cap	-0.000126	0.000065	-1.94	0.192	51.22
Unemployment	0.136	0.494	0.28	0.809	17.29
Mean Years Educ.	-2.53	3.26	-0.77	0.52	394.17
Marriage Rate	0.32	3.86	0.08	0.942	105.25
Life Expectancy	2.45	1.47	1.67	0.236	356.39
Inflation	0.013	0.126	0.1	0.927	5.1

No. Observations	9
R Square	85.91%
R Square (adj.)	36.60%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	27.9	31.3	0.89	0.414	
Gini	-0.359	0.479	-0.75	0.487	25.63
GNI/ Cap	-0.000019	0.000036	-0.51	0.63	7.76
Unemployment	0.545	0.593	0.92	0.4	12.13
Marriage Rate	-2.05	3.02	-0.68	0.527	31.43

No. Observations	9
R Square	27.63%
R Square (adj.)	0.00%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	6.8	2.44	2.79	0.027	
Gini	-0.0364	0.0887	-0.41	0.693	1.01
GNI/ Cap	0.000011	0.000012	0.93	0.383	1.01

No. Observations	9
R Square	12.11%
R Square (adj.)	0.00%

Table 3G) Netherlands:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	44	35.7	1.23	0.433	
Gini	0.0024	0.00611	0.39	0.762	4.98
GNI/ Cap	0.000018	0.000018	0.95	0.515	52.46
Unemployment	-0.0058	0.0508	-0.11	0.928	7.7
Mean Years Educ.	0.814	0.797	1.02	0.493	303.45
Marriage Rate	-0.015	0.361	-0.04	0.974	85.91
Life Expectancy	-0.587	0.539	-1.09	0.473	431.32
Inflation	0.1304	0.0785	1.66	0.345	4.41

No. Observations	8
R Square	94.05%
R Square (adj.)	52.40%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	5.21	1.19	4.39	0.012	
Gini	0.00086	0.00597	0.14	0.893	4.58
GNI/ Cap	0.000018	0.000011	1.66	0.172	18.35
Unemployment	-0.0332	0.0399	-0.83	0.452	4.57
Marriage Rate	0.362	0.17	2.12	0.101	18.41

No. Observations	8
R Square	75.32%
R Square (adj.)	50.64%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	7.978	0.298	26.8	0	
Gini	-0.00926	0.00599	-1.55	0.173	2.38
GNI/ Cap	-0.000007	0.000006	-1.21	0.273	2.38

No. Observations	9
R Square	28.53%
R Square (adj.)	4.71%

Table 3H) Portugal:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	7.3	12.3	0.6	0.565	
Gini	-0.0301	0.066	-0.46	0.659	19.53
GNI/ Cap	-0.000003	0.000049	-0.07	0.947	15.88
Unemployment	-0.0396	0.0837	-0.47	0.648	8.8
Mean Years Educ.	-0.046	0.413	-0.11	0.913	10.99
Marriage Rate	0.059	0.257	0.23	0.823	33.15
Life Expectancy	-0.007	0.177	-0.04	0.968	39.45
Inflation	-0.0022	0.0386	-0.06	0.955	10.23

No. Observations	16
R Square	71.93%
R Square (adj.)	50.11%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	6.427	0.966	6.65	0	
Gini	-0.0303	0.0208	-1.46	0.171	2.57
GNI/ Cap	-0.000007	0.000031	-0.24	0.812	8.34
Unemployment	-0.0359	0.0369	-0.97	0.351	2.27
Marriage Rate	0.068	0.094	0.72	0.483	5.86

No. Observations	16
R Square	71.75%
R Square (adj.)	62.33%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	7.088	0.563	12.59	0	
Gini	-0.0336	0.0193	-1.74	0.105	2.3
GNI/ Cap	-0.000034	0.000016	-2.12	0.053	2.3

No. Observations	9
R Square	68.09%
R Square (adj.)	63.54%

Table 3I) United Kingdom:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	9.1	12.2	0.74	0.534	
Gini	-0.0148	0.0183	-0.81	0.503	28.18
GNI/ Cap	0.000023	0.000025	0.95	0.442	53.01
Unemployment	-0.086	0.255	-0.34	0.768	148.3
Mean Years Educ.	0.04	0.124	0.32	0.777	52.7
Marriage Rate	0.342	0.274	1.58	0.255	51.17
Life Expectancy	-0.056	0.199	-0.28	0.806	94.31
Inflation	-0.037	0.114	-0.33	0.774	125.21

No. Observations	9
R Square	85.03%
R Square (adj.)	32.61%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	6.053	0.461	13.14	0	
Gini	-0.01911	0.0073	-2.62	0.047	10.58
GNI/ Cap	0.000017	0.000005	3.42	0.019	5.29
Unemployment	-0.1623	0.0671	-2.42	0.06	24.27
Marriage Rate	0.386	0.115	3.36	0.02	21.43

No. Observations	9
R Square	84.20%
R Square (adj.)	71.55%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	6.796	0.16	42.57	0	
Gini	-0.00094	0.00287	-0.33	0.751	1.23
GNI/ Cap	0.00007	0.00003	1.98	0.083	1.23

No. Observations	9
R Square	41.40%
R Square (adj.)	26.76%

Table 3J) United States of America:

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	-378.5	53.9	-7.03	0.09	
Gini	0.1059	0.0111	9.55	0.066	105.85
GNI/ Cap	0.000756	0.000102	7.4	0.086	6618.75
Unemployment	1.521	0.2	7.61	0.083	619.8
Mean Years Educ.	-4.188	0.666	-6.29	0.1	263.1
Marriage Rate	10.52	1.45	7.27	0.087	13634.12
Life Expectancy	4.049	0.583	6.94	0.091	2436.4
Inflation	-0.1679	0.0303	-5.53	0.114	24.72

No. Observations	8
R Square	99.73%
R Square (adj.)	97.83%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	-0.78	6.4	-0.12	0.909	
Gini	0.0355	0.0102	3.48	0.025	6.85
GNI/ Cap	0.000059	0.000051	1.15	0.314	127.78
Unemployment	0.1633	0.0782	2.09	0.105	7.27
Marriage Rate	0.477	0.515	0.93	0.407	132.05

No. Observations	8
R Square	85.82%
R Square (adj.)	71.65%

	Coefficients	Standard Error	t-Statistic	P Value	VIF
Constant	7.005	0.513	13.66	0	
Gini	0.00745	0.00722	1.03	0.337	1.4
GNI/ Cap	0.000008	0.00001	0.81	0.444	1.4

No. Observations	8
R Square	14.19%
R Square (adj.)	0.00%

End Notes

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