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Does Globalization Mitigate Income Inequality?

Gordon G. Bechtel
University of Florida and Florida Research Institute

Abstract: Bechtel (2012) showed that economic anxiety accompanying loss of household income and purchasing power has harmful effects on consumer demand, voter turnout, institutional trust, societal satisfaction, and well being. This sequel shows that economic anxiety is driven by income inequality, which mimics the detrimental effects of economic anxiety. The strongest shock of income inequality is its incitement of societal dissatisfaction. It is demonstrated that globalization reduces income inequality, alleviating economic anxiety and its negative impacts. These effects were found in a large cross-national sample from the fifth round of the European Social Survey. They demonstrate the value of using survey responses as micro outcomes for assessing macro-economic phenomena.

Key words: Economic anxiety, European Social Survey, GINI index of income inequality, interpreted regression effects, KOF index of globalization, randomization-based regression, survey criteria for a successful state.

1. Introduction

1.1 Income Inequality

Bechtel (2013), p. 238, emphasizes that

> Income inequality, a perennial problem for capitalist economies, has now become a global issue. Aly (2011) views this inequality as the major causal factor in the 2011 Arab Spring and the 2011 Occupy Wall Street demonstrations in the United States. In 2012 the latter movement morphed into the 99 Percent Spring, protesting the fact that 1% of Americans earn 21% of all U.S. income (Collins, 2012).

Extreme income inequality in the United States and China (cf., Table 1), the world's largest economies, poses a threat to global stability that extends far beyond the Arab Spring. However, poverty was unmentioned in the national election of 2012 in the United States. In contrast, the new Chinese government has announced a plan to narrow the gap between the rich and poor in its rapidly growing Economy (Riley and Kam, 2013, February 5):

> The lengthy document, posted on the government's website, contains a broad set of promises to combat growing inequality ⋯ The blueprint also contains a pledge to narrow the huge difference in income between citizens living in rural areas and those in fast-growing urban areas, where wages are typically much higher. ⋯ Last month, China's statistical agency said the nation's Gini coefficient, a commonly used measure of income inequality, was 0.47 in 2012. That figure ranks China near the United States, but well behind many of the world's developed economies.

Table 1: Income inequality in western and BRICS economies

	European Countries	Japan & India	Russia	U.S.A. & China	Brazil	South Africa
Gini coefficient	0.23-0.34	0.35-0.39	0.40-0.44	0.45-0.49	0.50-0.54	> 0.60

Note: Each country is within the Gini-coefficient range indicated. This 2009 report is found in Wikipedia (2012).

Income inequality in America, Asia, and even egalitarian Europe is causing protest, financial uncertainty, and educational inequity (Aly, 2011; Duncan and Murnane, 2011; Collins, 2012; Krueger, 2012). The personal face of loss of income and purchasing power is "economic anxiety", a term now common in public discourse (Herbert, 2008; Healy, 2008; Saad, 2008; 2011; Taylor, 2011; Robison, 2012; Leonhardt, 2012; Newport, 2012). Bechtel (2012) showed that economic anxiety accompanying the loss of household income has negative effects on consumer demand, voter turnout, political trust, societal satisfaction, and life quality. These effects were found in a large cross-national sample from the fifth round of the European Social Survey (Fitzgerald, 2012).

The present sequel relates personal economic anxiety to a measure of national income inequality. It is confirmed that income inequality repeats the negative individual-level effects of economic anxiety and exacerbates economic anxiety itself. The untoward effects of income inequality on individual buying, voting, trust, satisfaction, and well being are threats to the success of a modern capitalist or socialist state in serving its people.

1.2 Globalization to the Rescue?

1.2.1 Literal versus Technical Globalization

Referring to "globalization" Chomsky (2010), p. 35, comments

> Like most terms of political discourse, this term has two meanings: a literal meaning and a technical meaning employed for doctrinal warfare. In the literal sense, "globalization" means ⋯ international integration−economic, cultural, political−that serve the interests of people: real people, of flesh

> and blood. But in the doctrinal system ··· the term "globalization" in its technical sense, *refers* to a particular form of international economic integration, with a mixture of liberal and protectionist measures and many related to investor rights, not trade, all designed to serve the interests of investors, financial institutions, and other centers of concentrated state-private power−those granted the rights of super-persons by the courts. (Italics mine.)

The technical form of globalization was revealed earlier by Perkins (2004, Preface xi-xii), who described his job definition as an American economic field worker:

> My job was ··· to "encourage world leaders to become part of a vast network that promotes U. S. commercial interests. In the end, those leaders become ensnared in a web of debt that ensures their loyalty. We can draw on them whenever we desire − to satisfy our political, economic, or military needs. In turn, they bolster their political positions by bringing industrial parks, power plants, and airports to their people. The owners of U. S. engineering/construction companies become fabulously wealthy."

The technical meaning of globalization for doctrinal warfare has recently been updated by an American presidential policy directive (Greenwald and MacAskill, 2013):

> Barack Obama has ordered his senior national security and intelligence officials to draw up a list of potential overseas targets for US cyber-attacks ··· The 18-page, Presidential Policy Directive 20 issued in October last year but never published, states that what it calls Offensive Cyber Effects Operations (OCEO) "can offer unique and unconventional capabilities to advance US national objectives around the world with little or no warning to the adversary or target and with potential effects ranging from subtle to severely damaging". ··· It says the government will "identify potential targets of national importance where OCEO can offer a favorable balance of effectiveness and risk as compared with other instruments of national power". ··· In the presidential directive, the criteria for offensive cyber operations in the directive is not limited to retaliatory action but vaguely framed as advancing "US national objectives around the world". Obama further authorized the use of offensive cyber attacks in foreign nations without their government's consent whenever "US national interests and equities" require such nonconsensual attacks.

The inevitability of extreme income inequality resulting from technical globalization has long been anticipated by American planners. Chomsky (2010), p. 36, points out that

> ··· Clinton administration analysts concluded that "globalization of the world economy" will lead to a "widening economic divide" along with "deepening economic stagnation, political instability, and cultural alienation" ···

He concludes

> The answer to the question, globalization for whom? depends on which meaning of the term we choose: the literal meaning or the technical meaning that is standard in public discourse. If we mean "globalization" in the technical sense, then ⋯ it will be globalization in the interests of the principle architects of policy. The interests of the people may be helped or harmed, but that is incidental. ⋯
>
> Today, popular struggles in Latin America show real promise of serving as an inspiration to others worldwide, in a common quest for globalization in a form that should be the aspiration of decent people everywhere. (Chomsky, 2010, p. 38)

1.2.2 The KOF Index of Globalization

The present study uses the KOF index of globalization whose components (in Table 2) capture the literal meaning of globalization more closely than other measures of this construct. This index was introduced in 2002 (Dreher, published in 2006) and inspired by Visions of Governance for the 21st Century in Cambridge, Massachusetts (Nye and Donahue, 2000). It is produced by the KOF Swiss Economic Institute at ETH Zurich, and is updated and described in detail by Dreher, Gaston and Martens (2008).

The KOF index is the most widely used measure of globalization. Its choice here is supported by our results in Section 4.2, which show that globalization alleviates income inequality and economic anxiety. High KOF index values are also associated with increased consumer demand, voter turnout, political trust, societal satisfaction, and well being in Europe.

These findings, however, run counter to Dreher, Gaston, and Martens (2008, Chapter 4), who report KOF globalization's (very small) positive effect on inequality as measured from the University of Texas Inequality Project (UTIP). In reviewing their panel regressions, which used 100 nations over several time periods, Gassebner (2009), p. 780, emphasizes

> the role of globalization for the worldwide trend of unionization. Dreher, Gaston and Martens report that both the economic dimension and the social dimension of globalization are key determinants of this relationship. While the former reflects the increased bargaining power of multinational corporations, the latter can be associated with a spreading of the American system of weak unions. Taking these findings further, the authors also report that globalization has increased inequality.

Nevertheless, Dreher *et al.* (2008), p. 158, caution that their result

> only prevails in the overall sample of countries. We can therefore not make any predictions as to whether developed or developing countries are more likely to experience rising inequality as a consequence of globalisation.

Our contrary findings point to the need for conditioning on particular regions and types of nations in assessing the effects of globalization. In the present study

Table 2: KOF index of globalization

Components	***Weights***
Economic Globalization	**36%**
Actual flows	*50%*
Trade (percent of GDP)	21%
Foreign direct investment, stocks (percent of GDP)	28%
Portfolio investment (percent of GDP)	24%
Income payments to foreign nationals (percent of GDP)	27%
Restrictions	*50%*
Hidden import barriers	24%
Mean tariff rate	27%
Taxes on international trade (percent of current revenue)	26%
Capital account restrictions	23%
Social globalization	**37%**
Data on Personal Contact	*34%*
Telephone Traffic	25%
Transfers (percent of GDP)	3%
Foreign Population (percent of total population)	21%
International letters (per capita)	24%
Data on Information Flows	*35%*
Internet Users (per 1000 people)	33%
Television (per 1000 people)	36%
Trade in Newspapers (percent of GDP)	31%
Data on Cultural Proximity	*31%*
Number of McDonald's Restaurants (per capita)	45%
Number of Ikea (per capita)	45%
Trade in books (percent of GDP)	10%
C. Political Globalization	**26%**
Embassies in Country	25%
Membership in International Organizations	28%
Participation in U.N. Security Council Missions	22%
International Treaties	26%

Note: This table may be accessed by clicking on variables and weights at http://www.globalization-index.org/.

we deal with a highly developed zone of strong unionization and corporate regulation.

1.3 The Study Plan

Section 2 describes the Gini and KOF indexes, along with survey criteria for assessing their human impact. Section 3 mathematically interprets Gini and KOF regression slopes as effects on individual experience. Section 4 estimates these regression effects on data from the European Social Survey. Section 5 emphasizes the importance of survey criteria for assessing the personal impacts of national income inequality and globalization.

2. Variables

2.1 The Gini Index of Income Inequality (I_c)

Our measure of national income inequality is provided by the Gini coefficient (Wikipedia, 2012), which is the most widely used score of this construct. This coefficient is derived from a Lorenz curve in the unit square from (0,0) to (1,1). This curve is concave upward and runs below the diagonal from (0,0) to (1,1). Letting the area between the diagonal and the Lorenz curve equal A, the Gini coefficient is $I_c = A/0.5 = 2A$, which is a proportion of the triangular area (0.5) below the diagonal. This latter proportional area is interpreted as an index of income inequality when for any point on the Lorenz curve

- its value on the abscissa of the unit square is the proportion of people below a given income, and
- its value on the ordinate of the unit square is the proportion of income earned by those people

(cf., Samuelson and Nordhaus, 1985, Chapter 25). Thus, if x% of people earn x% of income for all x between 0% and 100%, then the Lorenz curve is the diagonal of the unit square from (0,0) to (1,1). In this case everyone in country c earns the same income, and the Gini coefficient $I_c = 0$. In contrast, suppose one person earns 100% of income with all others earning nothing. Here the Lorenz curve proceeds from (0,0) along the abscissa to (1,0) and vertically rises at a right angle to (1,1). In this extreme case the area between the diagonal and the Lorenz curve is 0.5 and the Gini coefficient $I_c = 1$.

In the present study Gini coefficients are calibrated to range between 0 and 10 so as to be commensurate with the survey variables exhibited in Table 3. Moreover, the Gini value I_c for country c is interpreted as the mean of a latent national distribution of individuals on the interval [0,10]. This latent variable, termed personal inequity, reflects the injustice or unfairness of national income inequality that is experienced at the individual level. Thus, for individual i in

country c

$$I_{ic} = \tau_{ic} + U_{ic}, \tag{2.1}$$

where $I_{ic} = I_c$, τ_{ic} is individual ic's personal inequity, and U_{ic} is its deviation from I_c. Our assumption that I_c is the mean $\tau_{\cdot c}$ implies that $\sum_{i=1}^{N_c} U_{ic} = 0$ for each country c.

To place the present European study in perspective, Table 1 exhibits the range of Gini coefficients for the western market economies and the developing BRICS nations. The message is clear: Europe sets an egalitarian standard for the rest of the world.

2.2 The KOF Index of Globalization (G_c)

> The KOF Index of Globalization was introduced in 2002 (Dreher, published in 2006) and is updated and described in detail in Dreher, Gaston and Martens (2008). The overall index covers the economic, social and political dimensions of globalization. $\cdots$ it defines globalization to be the process of creating networks of connections among actors at multi-continental distances, mediated through a variety of flows including people, information and ideas, capital and goods. Globalization is conceptualized as a process that erodes national boundaries, integrates national economies, cultures, technologies and governance and produces complex relations of mutual interdependence.
>
> More specifically, the three dimensions of the KOF index are defined as:
>
> - economic globalization, characterized as long distance flows of goods, capital and services as well as information and perceptions that accompany market exchanges;
> - political globalization, characterized by a diffusion of government policies; and
> - social globalization, expressed as the spread of ideas, information, images and people. (http://globalization.kof.ethz.ch)

The breakdown of these three dimensions is given in Table 2, which exhibits the weighting of each sub-indicator in the overall index. In the present study the KOF Index G_c for country c ranges between 0 and 10 so as to be commensurate with the survey variables in Table 3.

2.3 Survey Criteria for Successful Sovereignty

Table 3 exhibits the six individual-level variables that we use as criteria for successful sovereign performance in serving the people of a nation. In order to compare regression effects across the different criteria, responses to the fourteen items (making up the six scales) in Table 3 are calibrated to range between 0 and 10. Each criterion score is the average of its component item scores and also ranges between 0 and 10. This survey score is deconstructed as

Table 3: Items in the individual-level criterion scales

Construct	*Score*
Economic anxiety	$\boldsymbol{Y_{ic1}}$
In the last 3 years I have had to ⋯	
manage on a lower household income.	
draw on my savings or get into debt to cover ordinary living expenses.	
Not at all 0 1.67 3.33 5 6.67 8.33 10 *A great deal*	
Consumer demand	$\boldsymbol{Y_{ic2}}$
In the last 3 years I have had to cut back on holidays or new household equipment?	
A great deal 0 1.67 3.33 5 6.67 8.33 10 *Not at all*	
Voting propensity	$\boldsymbol{Y_{ic3}}$
Some people don't vote nowadays for one reason or another. Did you vote in the last	
[country] national election in [month/year]? *No* 0 10 *Yes*	
Institutional trust	$\boldsymbol{Y_{ic4}}$
How much do you personally trust your country's ⋯	
parliament? politicians? political parties? legal system?	
No trust at all 0 1 2 3 4 5 6 7 8 9 10 *Complete trust*	
Societal satisfaction	$\boldsymbol{Y_{ic5}}$
The present state of your country's economy	
The way your country's government is doing its job	
The way democracy works in your country	
Extremely dissatisfied 0 1 2 3 4 5 6 7 8 9 10 *Extremely satisfied*	
Well being	$\boldsymbol{Y_{ic6}}$
Over the last 2 weeks I have felt ⋯	
cheerful and in good spirits.	
calm and relaxed.	
active and vigorous.	
At no time 0 — *Some of the time* 2 — *Less than half of the time* 4 — *More than half of the time* 6 — *Most of the time* 8 — *All of the time* 10	

Note: The items in this table are adapted from the website ess.nsd.uib.no. The question on voting refers to the last election of a country's primary legislative assembly.

$$Y_{icj} = \eta_{icj} + E_{icj}, \quad \text{for} \;\; j = 1, \cdots, 6, \tag{2.2}$$

where η_{icj} is the true value of construct j for individual i in country c. The measurement error E_{icj} is the average of the item errors in measuring construct j. These survey item errors, which are response coding or imputation errors, are explicated by Bechtel (2012, 2013). We assume that $\sum_i E_{icj} = 0$ $(i = 1, \cdots, N_c)$ for each country c (like the deviations U_{ic} in (2.1)).

The terms in (2.2) lie on a continuous interval scale that is common to each construct $j = 1, \cdots, 6$. The origin and unit of this scale are set by coding the extreme response labels of each item in Table 3 as zero and ten. This imparts the same interval scaling to true and observed survey scores, η_{icj} and Y_{icj}, allowing the comparison of regression effects in Table 4.

Table 4: Personal effects of income inequality and globalization

	Economic anxiety	Consumer demand	Voting propensity	Institutional trust	Societal satisfaction	Well being
Income inequality	1.229	-1.150	-0.425	-1.089	-1.578	0.002
	(16.0)	(-13.0)	(-4.6)	(-23.3)	(-36.9)	(0.04)
Globalization	-0.300	0.273	0.215	0.802	0.144	0.288
	(-5.3)	(4.2)	(3.1)	(23.2)	(4.4)	(7.5)

Note: Each coefficient is the slope of its individual-level variable on national income inequality or globalization. These slopes were estimated from six randomization-based regressions. Their t statistics measuring significance level are in parentheses. The imputed net sample size for each of these regressions is 34085.

3. Interpreted Regression Effects

3.1 The Effect of Globalization on Personal Inequity

3.1.1 Population Regressions

Referring to (2.1), we posit a pan-European population

$$\{\tau_{ic}\, U_{ic}\, I_{ic}\, G_{ic} \mid i = 1, \cdots, N_c; c = 1, \cdots, 18\},$$

in which each individual ic carries her (his) country's national characteristics of inequality and globalization. Thus, $I_{ic} = I_c$ and $G_{ic} = G_c$, where country c has population size N_c. Over this cross-national population we write regressions

$$I_{ic} = \lambda + \gamma G_{ic} + \omega_{ic}, \quad \text{and} \tag{3.1a}$$

$$\tau_{ic} = \lambda + \gamma G_{ic} + \upsilon_{ic}. \tag{3.1b}$$

Subtracting (3.1b) from (3.1a) and using (2.1) gives $U_{ic} = \omega_{ic} - \upsilon_{ic}$, showing that the deviation in (2.1) is the difference between specification errors in regressions (3.1a) and (3.1b).

(3.1b) gives an interpretation of the slope γ in (3.1a) as an effect of national globalization on personal inequity τ_{ic}. The common intercept and slope in (3.1a) and (3.1b) are OLS identified by

$$(\lambda\,\gamma)^T = \left[\sum Z_{ic}Z_{ic}^T\right]^{-1} \sum Z_{ic}I_{ic} = \left[\sum Z_{ic}Z_{ic}^T\right]^{-1} \sum Z_{ic}\tau_{ic}, \qquad (3.2)$$

where $Z_{ic} = (1\, G_{ic})^T$. The summations in (3.2) run over $i = 1, \cdots, N_c$, for $c = 1, \cdots, 18$. Writing out each summation $\sum$ as $\sum_c \sum_i$, (3.2) follows from the equalities

$$\begin{aligned}\sum_c \sum_i Z_{ic}I_{ic} &= \sum_c \sum_i Z_{ic}\,(\tau_{ic} + U_{ic}) = \sum_c \sum_i Z_{ic}\tau_{ic} + \sum_c Z_c \sum_i U_{ic} \\ &= \sum_c \sum_i Z_{ic}\tau_{ic},\end{aligned}$$

which are due to (2.1), $Z_{ic} = Z_c$, and $\sum_i U_{ic} = 0$ $(i = 1, \cdots, N_c)$ for each country c.

3.1.2 Sampling and Estimation

Round five of the ESS has drawn (without replacement) a stratified cross-national sample in which each country is a stratum. We regard these Europeans as sampled from the population posited in Section 3.1.1. This item sample of n_c for each country c generates a net sample of Gini and Globalization scores

$$\{I_{ic}\,G_{ic} \mid i = 1, \cdots, r_c;\ c = 1, \cdots, 18\},$$

where $r_c < n_c$ due to unit non-response in round five of the ESS.

The estimate of our target parameter in (3.2) is

$$(\hat{\lambda}\,\hat{\gamma})^T = \left[\sum w_{ic}Z_{ic}Z_{ic}^T\right]^{-1} \sum w_{ic}Z_{ic}I_{ic}, \qquad (3.3)$$

which is a function of Gini and Globalization values. In (3.3) the two weighted net-sample totals run over $i = 1, \cdots, r_c$ for $c = 1, \cdots, 18$. These totals are Horvitz Thompson estimates of the population totals in (3.2) that run over $i = 1, \cdots, N_c$ for $c = 1, \cdots, 18$. The euroweights w_{ic} in (3.3), given by Bechtel (2012, Formula 5.1), adjust our pan-European data for each country's population size. They also adjust the ESS sampling weights for each country's unit non-response, which reduces the sample size in each country from n_c to r_c.

Section 4.2.1 below gives the estimated effect of globalization on personal inequity computed from (3.3). This classic randomization-based formula for weighted regression is found in recent literature on survey sampling (Chaudhuri and Stenger, 2005; Opsomer, 2009; Godambe and Thompson, 2009; Lohr, 2010). Randomization-based (versus model based) regression over large populations is preferred by government agencies, polling organizations, and the survey industry.

3.2 The Effects of Income Inequality and Globalization on True Survey Scores

3.2.1 Census and Population Regressions

To further access individual outcomes of our macro-economic phenomena, we formulate a pan-European population of true survey scores, a census of observable scores, and a set of error scores (cf., Section 2.3):

$$\begin{aligned}
&\{\eta_{ic1}\ \eta_{ic2}\ \eta_{ic3}\ \eta_{ic4}\ \eta_{ic5}\ \eta_{ic6}\}\,,\\
&\{Y_{ic1}\ Y_{ic2}\ Y_{ic3}\ Y_{ic4}\ Y_{ic5}\ Y_{ic6}\}\,, \quad \text{and}\\
&\{E_{ic1}\ E_{ic2}\ E_{ic3}\ E_{ic4}\ E_{ic5}\ E_{ic6}\}\,,
\end{aligned}$$

where $i = 1, \cdots, N_c$ for $c = 1, \cdots, 18$. The second (hypothetical but possible) dataset is derived from a cross-national census of the fourteen ESS items in Table 3. Missing census ratings are assumed to be filled in by regression imputation (cf., Bechtel, 2012, 2013). Row ic in this dataset consists of individual ic's six scores, which are averages over subsets of her (his) ratings and imputations of the items in Table 3. These six scores also appear in the last column of Table 3. Row ic in the third set above contains ic's six error scores, which are differences between elements of the first two sets (cf., (2.2)).

For each survey variable $j = 1, \cdots, 6$, we write the census and population regressions

$$Y_{icj} = \kappa_j + \delta_j I_{ic} + \theta_j G_{ic} + \nu_{icj}, \quad \text{and} \tag{3.4a}$$

$$\eta_{icj} = \kappa_j + \delta_j I_{ic} + \theta_j G_{ic} + \varepsilon_{icj}, \tag{3.4b}$$

where $i = 1, \cdots, N_c$ for $c = 1, \cdots, 18$. Subtracting (3.4b) from (3.4a), and using (2.2), gives measurement error $E_{icj} = \nu_{icj} - \varepsilon_{icj}$ as the difference between specification errors in these two regressions.

(3.4b) gives interpretations of the slopes δ_j and θ_j in (3.4a) as effects of national income inequality and globalization on true survey criterion scores η_{icj}.

The common intercept and slopes in (3.4a) and (3.4b) are OLS identified by

$$\begin{aligned}(\kappa_j \delta_j \theta_j)^T &= \left[\sum X_{ic} X_{ic}^T\right]^{-1} \sum X_{ic} \eta_{icj} \\ &= \left[\sum X_{ic} X_{ic}^T\right]^{-1} \sum X_{ic} Y_{icj}, \quad \text{for } j = 1, \cdots, 6, \end{aligned} \tag{3.5}$$

where $X_{ic} = (1 \ I_{ic} \ G_{ic})^T$. The totals in (3.5) run over $i = 1, \cdots, N_c$ for $c = 1, \cdots, 18$. Again writing $\sum$ as $\sum_c \sum_i$, and using (2.2), $X_{ic} = X_c$, and $\sum_i E_{icj} = 0$, (3.5) is shown by

$$\begin{aligned}\sum_c \sum_i X_{ic} Y_{icj} &= \sum_c \sum_i X_{ic} (\eta_{icj} + E_{icj}) = \sum_c \sum_i X_{ic} \eta_{icj} + \sum_c X_c \sum_i E_{icj} \\ &= \sum_c \sum_i X_{ic} \eta_{icj}. \end{aligned}$$

3.2.2 Sampling and Estimation with Non-Response

Unit non-response in the sample. Due to unit non-response in the ESS's sample, each country's sample size is reduced from n_c, the number of individuals drawn from the census, to r_c. This generates a net ESS round 5 sample of derived scores

$$\{Y_{ic1} \ Y_{ic2} \ Y_{ic3} \ Y_{ic4} \ Y_{ic5} \ Y_{ic6} \mid i = 1, \cdots, r_c; \ c = 1, \cdots, 18\},$$

where $r_c < n_c$. This net sample provides the estimate of our target parameter in (3.5) as

$$\left(\hat{\kappa}_j \ \hat{\delta}_j \ \hat{\theta}_j\right)^T = \left[\sum w_{ic} X_{ic} X_{ic}^T\right]^{-1} \sum w_{ic} X_{ic} Y_{icj}, \quad \text{for } \ j = 1, \cdots, 6. \tag{3.6}$$

In (3.6) the two weighted totals over $i = 1, \cdots, r_c$ for $c = 1, \cdots, 18$ are Horvitz-Thompson estimates of the census totals in (3.5). The euroweights w_{ic} (Bechtel, 2012, Formula 5.1) adjust for each country's population size. They also adjust the ESS sampling weights, which are based on selected sample sizes n_c for $c = 1, \cdots, 18$, for each country's unit non-response.

Item non-response in the census and sample. We assume that hypothetical regression imputations of missing census ratings (posited in Section 3.2.1) mimic actual regression imputations of missing sample ratings. Thus, any missing sample value has two imputations; namely, its fixed census imputation and its realized sample imputation. The latter is a realization of a random variable distributed over all samples containing this missing value. A large sample imputation closely estimates its census imputation (cf., Bechtel, 2012, Section 5.4;

Bechtel, 2013, Section 6.3). Therefore, the weighted totals in (3.6), which contain these large-sample imputations, are almost identical to the sample totals that would be obtained had census imputations actually been drawn in ESS's sample.

4. Pan-European Regressions

4.1 Globalization and Personal Inequity

Our estimated effect of globalization on personal inequity, computed from (3.3), is -0.219. This slope has a standard error of 0.0032 and an extremely significant t value of -68. Thus, in Europe globalization reduces income inequality and personally felt inequity.

As noted in Section 1.2.2, this result runs counter to Dreher *et al.* (2008, Chapter 4), who report that KOF globalization has a (near-zero, marginally significant) positive effect on inequality over 100 nations. They used the University of Texas Inequality Project (UTIP) measure of income inequality rather than the Gini coefficient. Our contrary result, in a highly developed zone of strong unionization and corporate regulation, points to the need for a more controlled assessment of globalization within particular regions.

4.2 The Survey Dataset

We address individual impacts of income inequality and globalization with recent data from the European Social Survey (Fitzgerald, 2012).

> The European Social Survey (the ESS) is an academically-driven social survey designed to chart and explain the interaction between Europe's changing institutions and the attitudes, beliefs and behaviour patterns of its diverse populations. ⋯ the survey covers more than thirty nations and employs the most rigorous methodologies. A repeat cross-sectional survey, it has been funded through the European Commission's Framework Programmes, the European Science Foundation and national funding bodies in each country. ⋯ The ESS is also among the first social science projects to receive funding to support its infrastructure. In 2005 the ESS was awarded Europe's top annual science award, the Descartes prize. The ESS has also been nominated by ESFRI as a possible future European Research Infrastructure Consortium. In 2007, funding was awarded to the ESS Preparatory Phase Project to prepare for possible selection as a European Research consortium infrastructure by 2013.
>
> Data collection takes place every two years, by means of face to face interviews of around an hour in duration ⋯. The questionnaire consists of a 'core' module lasting about half an hour which remains relatively constant

> from round to round $\cdots$ the core module aims $\cdots$ to monitor change and continuity in a wide range of socio-economic, socio-political, socio-psychological and socio-demographic variables. (http://www.europeansocia- lsurvey.org)

Bechtel (2013) observes that

> The quality and prospects of the ESS position it as a spatial and temporal baseline for investigating public opinion about income inequality − spatial because Europe is a demonstrable egalitarian criterion for other regions of the world $\cdots$, and temporal because upcoming ESS rounds will monitor change in this public attitude.

The present study uses the fourteen ESS items in Table 3. These items were administered in round 5 of the ESS during the aftermath of the global financial crisis of 2008 and the lead-up to the present Euro Zone crisis. Our pan-European sample includes the following 18 countries: Great Britain, The Netherlands, Belgium, France, Spain, Portugal, Germany, Switzerland, Denmark, Norway, Sweden, Finland, Estonia, The Czech Republic, Poland, Hungary, Slovenia and Bulgaria. In each country a representative probability sample was drawn from the residential population aged 15 and older. Thus, our sample is a stratified probability sample in which each country is a stratum. Sample regression imputations (cf., Section 3.2.2) preserved all of the 34085 cases in ESS's net cross-national sample.

4.3 Survey Impacts of Income Inequality and Globalization

For each individual ic, the six scores Y_{icj} in (2.2) were derived from fourteen item ratings and imputations, see Table 3. The net sample of survey scores

$$\{Y_{icj}\ I_{ic}\ G_{ic} \mid i = 1, \cdots, r_c; c = 1, \cdots, 18\}, \quad \text{for} \ \ j = 1, \cdots, 6,$$

generated the regression slopes in Table 4. These coefficients, computed from (3.6), are comparable because Y_{icj}, I_{ic}, and G_{ic} are calibrated on the common $[0, 10]$ scale described in Section 2. This allows each slope to be interpreted as a change in survey criterion j due to a one-unit change in the Gini or KOF indexes on the scale $[0, 10]$.

With the exception of well being, the personal impacts of income inequality are much stronger than those of globalization. However, globalization mitigates the societal shocks delivered by income inequality for five of our survey criteria. Five slopes in the first row of Table 4 show that loss of household income and purchasing power have strong and harmful societal effects, i.e., income inequality increases economic anxiety and suppresses buying, voting, institutional trust, and societal satisfaction. The impact of income inequality on societal satisfaction is the largest effect exhibited in Table 4.

The second row in Table 4 shows that globalization alleviates each of the untoward consequences in the first row and also increases personal well being. Thus, globalization alleviates anxiety about money and stimulates buying and voting behavior. It also enhances feelings of trust, satisfaction, and well being in society.

These micro outcomes confirm the mitigating effect of globalization on inequity reported in Section 4.1. The results in Table 4 serve as a 2010 baseline for monitoring the personal impacts of income inequality and globalization during the European financial crisis that also affects China and the United States. ESS data for 2011-12 will provide our first confirmation of the coefficients in Table 4. This next dataset will also indicate future directions that these effects may take.

5. Summary: Macro Effects on Micro Criteria

In closing their widely-used text, Samuelson and Nordhaus (1985), p. 895, revealed their dream:

> It is a dream that the remarkable efficiency of markets can in East and West be harnessed to the purposes of the humane society.

This prospect has been updated as "literal globalization" by Chomsky (2010, Chapter 1). The present paper pursues the human aspect of macro economics by tapping self reported experiences as outcomes of globalization and income inequality. These end points are calibrated by survey scores that are regressed on Gini and KOF indexes. Macro effects on micro criteria of a successful modern state were found in a cross-national sample from the fifth round of the European Social Survey (ESS).

The survey research leading to the present work (Bechtel, 2012) showed that economic anxiety accompanying the loss of household income and purchasing power has detrimental effects on consumer demand, voter turnout, institutional trust, societal satisfaction, and well being. This sequel shows that economic anxiety is driven by income inequality, which mimics five of six harmful effects of economic anxiety. Societal satisfaction receives the strongest shock from income inequality. However, income inequality and economic anxiety are both reduced by globalization, which also enhances buying and voting behavior, as well as individual-level trust, satisfaction, and well being.

The specter haunting income inequality and economic anxiety is of course unemployment. The human toll exacted by total loss of income has been described by Samuelson and Nordhaus (1985), pp. 207-209:

> However large the economic costs of unemployment, a recounting of dollars does not adequately convey the human, social, and psychological toll that persistent periods of involuntary unemployment bring. ⋯ recent studies indicate that unemployment leads to a deterioration of both physical and

> psychological health − higher levels of heart disease, alcoholism, and suicide. ⋯ other studies indicate that involuntary joblessness is a highly traumatic event for many people.

These words, now in a global context, give added urgency to the alleviation of income inequality in the United States and China, the world's largest economies, both with extreme income inequality, see Table 1. Table 4 shows that even in egalitarian Europe income inequality most strongly incites societal dissatisfaction. Beyond western and BRICS economies, the Arab Spring also signals income inequality, unemployment, and poverty as societal dangers in the 21st century.

In navigating these hazards a tentative, perhaps controversial, roadmap for political economies is given by Mark Leonard (2005) in his book Why Europe Will Run the 21st Century. His argument is summarized by Brookes (2005):

> What Europe has, argues Mark Leonard in his provocatively titled book, is a model, one centered around a new understanding of power and embodied in the institutions and norms of the European Union. The EU exerts an irresistible attraction on the countries around it, Leonard says, drawing them into its orbit, embedding them in its legal and economic framework and changing them from the inside out. Next to this "transformative power", the United States' military might, which can change regimes but not societies, and whose application is necessarily fleeting, seems a weak instrument indeed. Increasingly, Leonard tells us, we'll see more regional groupings emerge bound, as the EU is, by mutual self-interest and common values. It's in this sense, he argues, that Europe − or, more precisely, the "European way"−will dominate the 21st century.

The Gini coefficients in Table 1 demonstrate that European institutions and norms do set a 21st century standard for reduced income inequality. This evidence is reinforced by Bechtel (2013), who reports a favorable European attitude toward governmental action to redistribute income.

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Gordon G. Bechtel
University of Florida and Florida Research Institute
P.O. Box 117155, Gainesville, Florida 32611-7155, USA
bechtel@ufl.edu