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Population Size, Economic Development, and Attitudes Towards Inequality: Evidence from 30 Nations*

Authors: M.D.R. Evans and Jonathan Kelley
Affiliations: Departments of Resource Economics and Sociology, University of Nevada, Reno (Evans); Department of Sociology, University of Nevada, Reno (Kelley)
Corresponding author/address: M.D.R. Evans, Departments of Resource Economics and Sociology, University of Nevada, Reno, Reno, Nevada, USA. Email (*mevans@unr.edu*)

Abstract

How does population size affect social life? In accord with Durkheim's classic argument about the shift from the rigid "mechanical" solidarity of small societies to the more differentiated and interdependent "organic" solidarity of large societies, data from 30 nations and 19,568 respondents shows that the citizenry of large societies prefer more inequality in earnings than do citizens of small societies, net of the level of economic development. One reason for this is that citizens of large countries support larger rewards for education and occupational success. In most societies, the actual level of inequality is close to the ideal level, or a little higher. Data are from the World Inequality Study, which pools data from many excellent international survey projects; analysis is by OLS and multi-level regression.

Keywords

Population size, inequality, economic development, attitudes, international, earnings determination

Introduction

Does population size affect social life? Certainly classical sociological theorists held that it would, that the increasing volume of social interactions in large societies would change the way we think and behave. For example, Marx argued that the large workforces involved in factory production would show each worker so many others in the same boat as himself that it would be an easy step to see his hardship as an example of a general social problem – rather than as stemming from his individual character or from a particular relationship between him and the business owner as would be more likely in a small scale business or farm (Marx and Engels 1845[1972]). Durkheim's classic, *The Division of Labor in Society* (Durkheim 1902 [1933]), posited that the increasing scale of society could increase social cohesion by multiplying interdependencies, with people appreciating each other as fellow members of a collectivity

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because, in large scale societies and work organizations, each person's work can only achieve fruition with inputs from a host of others.

One particularly important claim in Durkheim's work is that a key consequence of increasing scale of social organization is the transition from "mechanical solidarity" based on likeness to "organic solidarity" based on differentiation and interdependency (Durkheim 1902 [1933]: 181, 192). There are implications of this claim for a whole spectrum of attitudes and values, but one key implication is that, net of other things, large societies should take a much more positive view of inequality than their smaller counterparts. In other words, the larger the society's population size, the more positive people's attitudes towards income inequality, ceteris paribus.

Testing this hypothesis has been impossible until recently because it requires data on attitudes towards inequality from countries with a broad array of population size, as well as data on population size and level of economic development.

Fortunately, precisely comparable, high quality data on attitudes towards earnings inequality has recently become available with the World Inequality Study pooling surveys including the appropriate items from many countries. That enables us to provide a systematic test of Durkheim's hypothesis that larger societies are more tolerant of income inequality.

Notice that the perspective taken here assumes that the citizenry's ideals about earnings inequality are unknown quantities that require measurement. This is in contrast to the usual tradition in welfare economics and political philosophy which posits (implausibly: Gijsberts 2002; Kelley and Evans 1993) that the ideal is no inequality and that departures from equality require special justification. Our approach asks (rather than assuming) what people's ideals are, and explores their roots in everyday life experiences. As we will see, the actual ideals are a long way from "no inequality", and they have strong links to other aspects of social life, notably population size. This has very different policy implications from those derived from the "no inequality is ideal" assumption.

1. Towards a theory of attitudes towards inequality

Let attitudes towards inequality be denoted I and population size be denoted P, then the organic solidarity hypothesis predicts that:

(Eq. 1) $I = b_0 + b_1 P + e$

where $b_0 \geq 0$ and $b_1 > 0$ and the unit of analysis is nations. For consistency with the familiar literature on actual levels of inequality, we take the Gini of ideal occupational earnings in a society as the measure of the ideal inequality for that society. (As discussed later, alternative measures of inequality would lead to the same conclusions.)

Societies differ in their size, and they also differ in many other ways, important among these being their level of economic development. We incorporate the level of economic development into the theory both (1) because including it in the model controls for the omitted-variables risk that population size could proxy development effects if development were not included and (2) because there are important theoretical implications of development in their own right that should not be ignored (Haller and Sharda 2005).

In particular, the strong educational and occupational upgrading that accompany economic development seem likely to decrease tolerance for inequality by (1) shrinking the ranks of the poor, so generosity towards them is a relatively light burden; (2) increasing the affluence as well as the size of the middle classes, so there are more to share the burden; and (3) swelling the ranks towards the top of the educational ladder, and so demystifying their achievements to the rest of society.

So the model becomes:

(Eq. 2) $I = c_0 + c_1 P + c_2 GDP + e$

where $c_0 \geq 0$, $c_1 > 0$, and $c_2 < 0$ and the unit of analysis is nations.

One can imagine many other things potentially influencing inequality ideals, but few of them seem likely to be correlated with population size, so it makes sense to proceed to estimate population size effects in this simple model without further ado, and to take the results as a kind of working hypothesis until more complete models, and data from a larger number of nations, become available in the future.

As will be seen, this model of country differences reveals strong population size effects, so it behooves us to proceed to investigate the mechanisms generating those differences. We propose that the key mechanisms are interactions between population size and well-established determinants of status attainment – that people who have large endowments of training and skill feel entitled to larger returns to them in larger societies. We reserve the formal presentation of this part of the theory to the appropriate substantive section, to facilitate cross-referencing.

2. Data

2.1 World Inequality Study

We analyze the World Inequality Study (WIS), which pools over 130 surveys from several major international survey projects; all are representative, nationwide samples (Kelley, Evans, and Sikora 2005). We recoded each survey to a common international standard in a project supported by a Research Infrastructure and Equipment Facility (RIEF) grant from the Australian Research Council to the Melbourne Institute of Applied Economic and Social Research, University of Melbourne (ARC/RIEF R00002808). This dataset and its protocols are described in detail elsewhere (Evans and Kelley 2004). We report results from 30 nations with the relevant inequality attitude measures including 19,568 individual respondents in the labor force full-time (working over 30 hours per week). These surveys were conducted in various years between 1994 and 2002, mostly in 1999 and 2000.

Most of the surveys analyzed here are from the 1999-2000 “Inequality-III” round of the International Social Science Project (ISSP) and the rest from the International Survey of Economic Attitudes and the International Social Science Survey/Australia. Most surveys began with interviews with a stratified random sample followed by a leave- behind self-completion questionnaire with the ISSP items. Several surveys were conducted entirely by mail and some entirely by interview. Australia's survey was a simple random sample but the other surveys involved various forms of clustering; we made no correction for the consequent loss in efficiency. Comparisons with the national census, where available, show the surveys to be representative of the populations sampled, with samples and census similar in age, education, occupation, and industry (Evans and Kelley 2002: Appendix; Sikora 1997; Zentralarchiv fuer Empirische Sozialforschung 2002).

2.2 Sample selectivity

The sample of countries included here is necessarily an opportunistic one depending on which countries happened to have research teams who took part in these large international projects or replicated questions from them, rather than a randomly drawn sample of countries. To assess whether this potential sample selectivity could introduce biases into our analyses, we conducted a selectivity analysis using a probit regression to predict inclusion of a country in our sample. The analysis focused on several major national characteristics: population size, level of economic development, Anglo-Celtic heritage, and *actual* income inequality as measured by World Bank data (see Appendix Table A1).

We find that more developed nations are significantly more likely to be included in our sample of nations. But, that said, the sample is not unrepresentative with respect to population size, Anglo-Celtic heritage, or actual inequality. Since level of development, measured by GPD per capita, is included in our model, it will not induce selectivity bias. Nonetheless, we would not wish to generalize from our results to countries outside the range of the data, namely those with appreciably less than 10% of US GDP per capita or with appreciably less than 1 million people.[1]

3. Measurement

3.1 Ideal earnings

The ideal earnings question builds on a long tradition measuring legitimate pay levels developed originally by (Verba and Orren 1985). These items have been used extensively, first in the International Social Science Survey/Australia (ISSS/A), then in the International Social Survey Programme's (ISSP) three "Inequality" surveys of 1987/88, 1992/93, and 1999/2000, and in other surveys as well. The earlier rounds of the ISSP have been widely analyzed (e.g. Austen 1999; Gijsberts 2002; Haller 1990; Kelley and Evans 1993; Svallfors 1997).

The questions open with:

> *Next, what do you think people in these jobs ought to be paid -- how much do you think they should earn each year before taxes, regardless of what they actually get...*
>
> *Please write in how much they ought to earn each year*
>
> *a. First, about how much do you think a skilled worker in a factory ought to earn?. . . . . $ _____ dollars*
>
> *b. A doctor in general practice?. . . . . $ _____ dollars*
>
> *etc...*

and then continues with seven or eight other occupations. These questions were answered in local currency units, for example dollars in the US and pounds in Britain. For the 1999 edition of the ISSP a

[1] The largest nation in our analysis is a bit under 300 million, noticeably smaller than India or China, so implications for them should be treated with some reserve as well. Our dataset includes only one nation with a population under 1 million, the Greek part of Cyprus. It has a tiny labor force, overwhelmingly dependent on the tourist trade, and subject to sharp year-to-year fluctuation in prosperity with the varying security climate of the region and the varying state of the Western European economy. We therefore have some reservations about it.

new question was included at the end of the list in accordance with recommendation 2b of the design committee (Kelley et al. 1997):

```
i. And someone who works in YOUR usual occupation
-- how much ought they earn? . . . . . . . . . . . $ _____________
                                                      dollars
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This last question is the one analyzed here.[2] It is what we mean when we refer to "legitimate inequality".

Unlike the other questions in the sequence, which ask people what they think *others* should earn, this last question asks what they think they, *themselves* (together with others in their occupation) should earn. This avoids issues of envy, jealousy, and invidious comparisons that can arise from asking what other occupations should earn. Moreover, respondents need not speculate about other people's psychology or motives – for example, about the role of incentives in getting others to work diligently or getting them to invest in education (e.g. Becker 1964; Davis and Moore 1945). Instead, they simply have to say what they believe is right for themselves.

For the country-level analysis assessing the effect of population size on inequality preference, our dependent variable is the Gini on these ideal earnings for each country separately. The Gini is independent of the currency units (dollars, pounds, etc) in which the question was answered.

For individual-level analyses, where the units do matter, we score each answer *relative* to the average full-time earnings of unskilled workers in respondent's country which, for simplicity, we call "minimum incomes" (Kelley and Evans 1993). For example, in Britain at the time of the survey unskilled workers earned a bit over 10,000 pounds. So we treat an Englishman who says he should earn 15,000 pounds as wanting 1.5 minimum incomes and an Englishwoman who says she should earn 30,000 pounds as claiming 3 minimum incomes. The assumption is that an Australian who claims 43,000 Australian dollars (1.5 times the minimum income in Australia) is making a claim, relative to the Australian economy, equivalent to the Englishman's 15,000 pound claim on the English economy. We ignore the fact that on the international market, the Australian can buy more than the Englishman, focusing instead on how each stands relative to his own countrymen. This focus on position *relative* to one's own country is usual in the inequality literature and, indeed, built into the very definition of the Gini and most other indices of inequality (Allison 1978; Gijsberts 2002; Hadler 2005; Slomczynski and Wesolowski 2001).

3.2 Other individual level variables

3.2.1 Years of education. measured by nation-specific questions and then recoded by the original investigators into equivalent years of formal education (Jagodinski and Uher 2001; Szelenyi and Treiman 1994). Additional, country-specific information on educational qualifications is available in some cases. We used all this information to construct scores as internationally comparable as possible. Country-by-country details are available on request.

3.2.2 Occupational status. is coded from the surveys' original 4-digit ISCO or similarly detailed country-specific scores into Treiman's 14-category Standard International Classification of Occupations (Treiman 1977), and thence into Worldwide Status Scores (Kelley 1990) ranging from 0 (farm laborers) through 1.0 (higher professionals). Analyses of occupational status attainment processes have been conducted throughout the world, including Brazil, one of the poor countries in our sample (Haller and Saraiva 1991; Neves, Fernandes, and Helal 2007). The particular scores we use are often employed in international

[2] It is v302 in the datafile publicly available from the Zentralarchiv via the ZA Online Study Catalogue [ZACAT on http://zacat.gesis.org/webview/index.jsp].

research (e.g. Kelley and Evans 1995; Sikora 2005) and are, in practice, essentially interchangeable with Ganzeboom-Treiman (Ganzeboom and Treiman 2003) ISEI scores (Evans et al. 2002).

3.2.3 Supervision/ authority. is scored 1 for respondents who direct the work of others and zero otherwise. Supervisors may own the business or themselves be employees. This dichotomy has been used successfully in prior research (Jackman and Jackman 1983; Vanneman and Cannon 1987), although even larger differences are obtained using a three-category measure (Robinson and Kelley 1979; Smith 1997).

3.2.4 Ownership of the means of production. Ownership is the core variable in the Marxist approach to class. We divide self-employment into the petit bourgeoisie and owners of larger enterprises who have 1 or more employees, and represent these as two dummy variables (Robinson and Kelley 1979).

3.2.5 Income. Earnings are measured in local currency, expressed as a ratio to the average earnings of full-time male unskilled workers in the same country (the "minimum income" as we call it. Thus income is measured *relative* to others in the same country rather than absolutely (for example, in parity purchasing power). This is consistent with the inequality literature and with our measurement of legitimate incomes.

3.2.6 Sample analyzed: Full-time workers. The analysis is confined to people employed full-time, defined as in the labor force and working for 30 hours a week or more. Analyses involving actual income are further restricted to those with earnings at least one quarter of the average income of full-time unskilled workers in their nation; this excludes some problematic cases such as those who only recently joined the labor force.[3]

3.3 National characteristics

3.3.1 Population size and *GDP.* These are from World Bank data for 1995 (World Bank 2002) with a few additions and amendments. In particular, we distinguish East and West Germany because of their very different political histories, especially relevant to the issues at hand.

3.3.2 Gini coefficient of inequality. The Gini coefficient is the most widely used measure of income inequality, and we therefore use it. In theory it can range from 0 to 1.0 but in practice it ranges from around .20 for very equalitarian societies like Sweden and Norway to around .60 for the most inequalitarian societies like Brazil. These numbers have become familiar and, in practice, give the Gini its meaning.

Most of the usual formal definitions of the Gini are opaque (Allison 1978). Perhaps the most lucid defines it thus (Damgaard and Weiner 2000): for all pairs of people in the population, compute the difference between their incomes, take the absolute value, and average. Express that as a proportion of the mean. So, for example, a Gini of .30 in a population with mean income of $50,000, means that the average difference between two randomly chosen people is $15,000 (i.e. .30 x $50,000).[4]

[3] The usual questions ask about income last year but about current job and other characteristics. So earnings of people who only recently joined the labor force can be grossly understated.

[4] Thus in the jargon the Gini is the "average absolute deviation" expressed as a proportion of the mean.

4. Description

To introduce the issues, let us set it in a familiar context by examining the distributions for the US of (1) ideal full-time earnings and, for comparison, (2) actual full-time earnings. Table 1 shows that both distributions cover a broad span.

4.1 Legitimate earnings in the US.

Some 10% of Americans think their occupation *ought* to be paid about $20,000 a year. Even more, 19%, think around $30,000 would be right. and another 22% think $40,000 would be right. About 17% think $50,000 would be right and still quite a few, 13%, feel $60,000 would be right. A further 9% think something around $75,000 would be right and 6% hold out for a full $100,000. At the top, 2% claim around $150,000. Overall, the average income Americans find legitimate for themselves comes to a handsome $51,000.

Thus if each American were paid exactly what he or she thinks right and proper, there would be substantial inequality, with a Gini coefficient of .29. An alternative inequality measure, the standard deviation of the distribution of log income, conveys the same image (Table 1, bottom row). Equality may be attractive to philosophers, but it is not at all close to what ordinary Americans think right.

Actual earnings follow a similar pattern but with everything lower (Table 1, second column). The mean is $37,000. That is 72% of what Americans think they ought to be paid, almost $15,000 less.

Table 1. What Americans think their occupation ought to earn, and what they do earn. [1]

Dollars per year	Ought to earn (percent)	Actually earn (percent)
$150,000	2	0
$125,000	0	1
$100,000	6	2
$75,000	9	7
$60,000	13	10
$50,000	17	10
$40,000	22	12
$30,000	19	21
$20,000	10	24
$10,000	1	13
Total	100%	100%
Cases	586	1870
Mean	$51,226	$36,876
Gini	.29	.32
s.d. log	.52	.59

[1] Men and women in the labor force, working full-time, adjusted upward to year 2006 income levels (approximate). "Ought to earn" questions asked in only one survey and "actually earn" in three.

4.2 Legitimate earnings in other nations.

Throughout the world people in different occupations think they should earn different amounts. Ideal earnings span a wide spectrum, with large differences among nations. For example, Figure 1 gives the distributions for 4 very diverse countries – the USA, Sweden, Brazil, and Russia. The distributions for all the countries in our sample are given below in Table 2. To facilitate comparisons across countries, we present them in the metric of minimum incomes (i.e. as the ratio of the respondent's nominated legitimate income to the actual income of full-time unskilled male workers in that country). Thus someone scored 2 thinks they should earn twice as much as blue collar workers actually earn in their nation).

The well known egalitarian preferences of tiny Sweden are clearly evident in the strong concentration of legitimate incomes between 1 and 1.5 and the paucity of incomes over 4 or under 1. The Swedish Gini, .15, is the lowest of the nations in this study. Legitimate incomes are more diverse in the US, with more at the low end and many more at the higher end; the result is a Gini twice Sweden's.

Legitimate incomes are even more unequally distributed in Brazil and Russia, with many more at both the low and especially the high end. Indeed, Brazil and Russia, both large nations, have the largest Ginis, .44 and .45, of any countries in the sample, three times the Swedish figure.

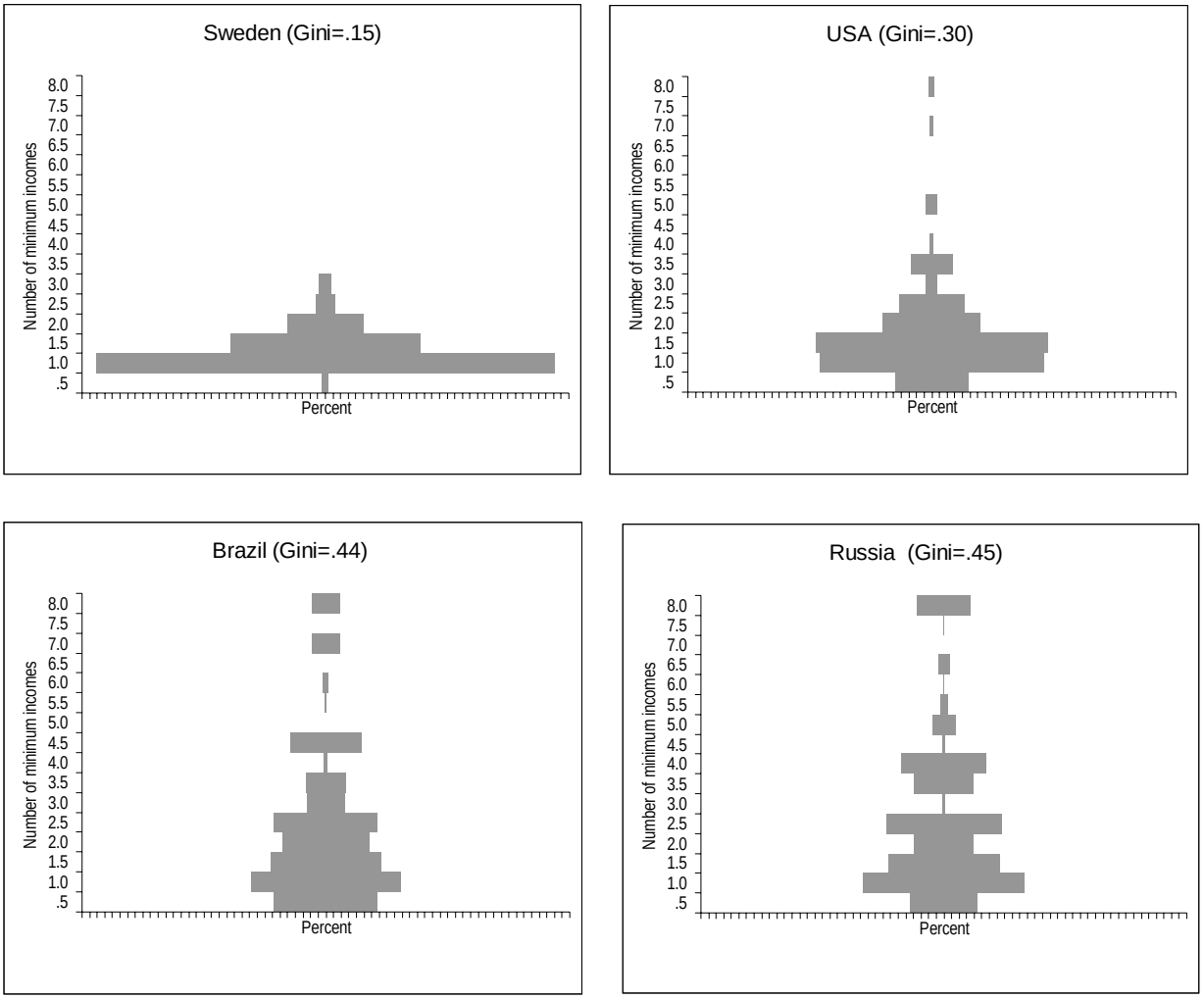


Figure 1. Earnings people think legitimate for themselves. Selected nations.
Source: World Inequality Survey. From Table 2.

Most of the countries in our sample have Ginis between .20 and .30, with only a few lower and a few higher (see Table 2).

4.3 American exceptionalism?

Americans prefer a little more inequality than most other nations but they are hardly exceptional. France, Japan, Israel and several Eastern European nations have similar preferences. Half a dozen nations (from the 30 in the study) prefer more inequality, but not a lot more – around half again the American level. A dozen and a half nations prefer less inequality than the US, but not a lot less – around two-thirds the American level. Britain and Australia are among them.

5. Population size and inequality: Cross-national evidence

For a first look at the plausibility of Durkheim's hypothesis about population size and inequality, Figure 2 shows the bivariate relationship without any controls. The x-axis shows population size and the y-axis legitimate inequality as measured by the Gini coefficient. There is a strong positive relationship, which is statistically significant (at p<.001). It suggests that small societies with populations less than 5 or 6 million (like Latvia, Norway, Slovenia or Northern Ireland) would typically have little inequality, with Gini coefficients a little over .20. In contrast, large societies with populations over 60 to 80 million (like West Germany, France or the Philippines) would typically have more inequality in legitimate income, with Ginis around .30. That is about half again as much inequality as citizens of smaller societies typically find proper.

Table 2. Population size and legitimate inequality. Persons working full-time. 19,568 respondents in 30 nations, circa 1999-2000.[1]

	Pop-ulation	Legitimate inequality[3]			GDP	Number of minimum incomes people believe their occupation ought to earn (percent)													
	(million)	Gini[2]	se Gini	s.d. log income	(USA 1995=1)	.5	1	1.5	2	2.5	3	4	5	6	7	8+	Total	Cases	Mean
Russia	148	**.45**	0.0141	.80	.27	9	21	15	8	15	8	12	3	1	2	7	100%	583	2.94
Brazil	159	**.44**	0.0136	.77	.28	14	20	14	11	14	5	6	8	1	3	4	100%	633	2.56
Philippines	68	**.40**	0.0147	.75	.13	10	19	16	19	12	6	9	3	1	1	4	100%	471	2.48
Poland	39	**.35**	0.0156	.58	.32	2	34	13	20	15	5	5	3	1	1	2	100%	1118	2.20
Chili	14	**.35**	0.0139	.58	.36	3	14	23	26	8	9	8	1	3	2	3	100%	555	2.44
Bulgaria	8	**.31**	0.0130	.53	.20	7	32	29	16	8	4	2	1	0	0	1	100%	869	1.71
Hungary	10	**.30**	0.0107	.52	.38	0	5	15	22	20	8	16	9	2	0	5	100%	465	3.01
USA	265	**.30**	0.0120	.52	1.21	9	29	30	13	9	7	0	1	0	0	1	100%	601	1.72
France	58	**.29**	0.0135	.49	.82	1	23	19	25	14	6	6	2	1	0	1	100%	908	2.13
Japan	125	**.28**	0.0117	.58	.91	7	15	23	20	23	4	4	3	0	0	1	100%	461	2.03
Portugal	10	**.28**	0.0112	.48	.58	0	10	26	23	5	23	6	2	2	2	1	100%	587	2.43
Israel	6	**.28**	0.0105	.50	.62	1	5	28	16	21	14	3	6	1	3	1	100%	514	2.59
Latvia	3	**.27**	0.0076	.48	.27	0	2	14	15	4	22	28	4	5	5	2	100%	585	3.42
Slovakia	5	**.26**	0.0090	.46	.43	4	28	24	20	0	16	5	0	3	0	0	100%	583	1.96
Germany-West	66	**.25**	0.0116	.46	.84	1	4	16	22	21	19	8	5	1	3	1	100%	354	2.67
Canada	29	**.25**	0.0083	.44	.98	9	32	33	16	2	5	1	0	1	0	0	100%	581	1.50
New Zealand	4	**.25**	0.0102	.43	.70	8	42	34	9	1	5	1	0	0	0	0	100%	550	1.38
Czech Republic	10	**.24**	0.0127	.42	.50	1	21	40	23	7	4	2	1	0	0	1	100%	875	1.85
Slovenia	2	**.23**	0.0091	.40	.57	0	20	36	21	14	4	3	1	0	0	0	100%	497	1.76
Cyprus	1	**.23**	0.0098	.39	.62	0	6	40	26	17	2	4	4	0	1	1	100%	707	2.13
Britain	59	**.23**	0.0100	.41	.82	6	36	36	10	7	4	1	0	0	0	0	100%	278	1.48
Australia	18	**.23**	0.0035	.39	.90	2	36	35	13	8	5	1	0	0	0	0	100%	3226	1.54
Netherlands	15	**.22**	0.0054	.40	.88	1	22	33	25	10	7	3	0	0	0	0	100%	1147	1.78
Austria	8	**.22**	0.0114	.39	.87	1	25	40	12	12	6	1	2	1	0	0	100%	335	1.74
Northern Ireland	2	**.22**	0.0097	.40	.82	0	9	21	32	17	10	7	3	0	0	0	100%	249	2.26
Germany-East	15	**.22**	0.0154	.39	.76	1	7	25	29	17	12	3	5	0	0	0	100%	214	2.20
Switzerland	7	**.21**	0.0164	.35	.97	0	5	34	28	19	9	2	1	1	0	0	100%	505	2.12
Spain	39	**.19**	0.0074	.34	.66	1	32	40	13	10	1	2	0	0	0	0	100%	468	1.58
Norway	4	**.16**	0.0063	.29	1.01	1	60	26	8	2	3	0	0	0	0	0	100%	680	1.35
Sweden	9	**.15**	0.0058	.26	.87	1	60	25	10	2	1	0	0	0	0	0	100%	610	1.35

[1] Population is in 1995. GDP is at parity purchasing power in year of survey, expressed as an index with USA in 1995= 1.0. Surveys were in 1994 to 2002, with most in 1999 or 2000. Data are for persons in the labor force, working 30 hours or more.
[2] Gini coefficients in bold face are significantly different from the USA at p<.05, one-tailed.
[3] Income respondents think their occupation ought to earn, expressed as a ratio to the average wage of full-time unskilled male workers in their nation.
Source: World Inequality Study.

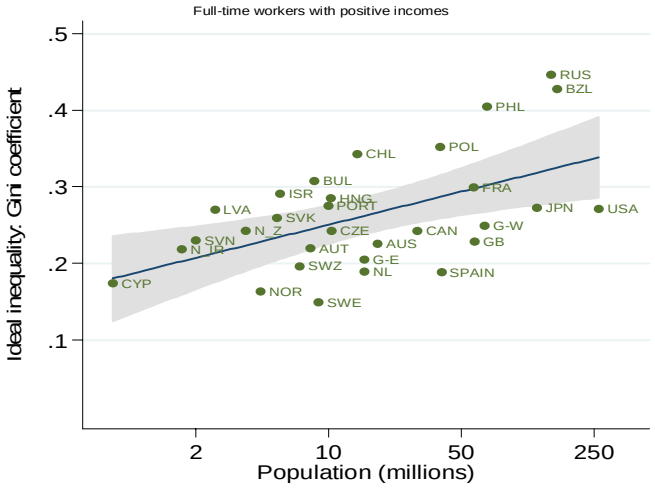
5.1 Controlling for economic development

Next, we assess whether this relationship is robust to a control for economic development. The regression analysis in Table 3 shows that population size still has a strong positive effect on legitimate inequality (t=6.05, p<.001).

The standardized regression coefficient, which facilitates comparison across predictor variables, is a very substantial 0.56, emphasizing the key result that the larger the population size, the greater the ideal inequality, ceteris paribus.

In metric terms, the typical difference between a small society with 5 million people and a large one with 105 million, both at the same level of economic development, would be around .07 on the Gini scale. So if , for example, both are at a middling level of development it would be .26 for the small society versus .33 for the large one.

Figure 2. Population size and ideal earnings inequality



Source: World Inequality Study

Furthermore, net of population size the legitimate range of inequality shrinks with economic development, as predicted (Table 3). In standardized terms, the effect is a very substantial -.74. In metric terms, the difference between a very poor society at just 10% or 15% of US GDP, like the Philippines, and a very rich one like the US or Switzerland would typically be about .19 on the Gini scale. So, for example, .37 for the poor society versus .19 for the rich one assuming both had a population of 50 million – thus the rich society has about half as much inequality as the poor.

In sum, the countries that prefer the greatest inequality are large, poor countries such as Brazil, the Philippines, and Russia. Those that prefer the least inequality are small, developed nations such as Norway and Sweden. Alternative analyses using a different measure of inequality lead to the same conclusions (see Appendix Table A2).

Table 3. Population size and legitimate inequality as measured by the Gini coeffiicient for the income people think proper for their own occupation. Aggregate results for N=30 nations, circa 1999-2000.[1]

	Metric	s.e.	t	Standard-ized
Population of nation (millions)	.00068	.00011	6.05	.56
GPD per capita (index; USA 1995=1.0)	-.216	.027	-8.05	-.74
Constant	.368	.018	20.46	.
R-squared	76%			

[1] Nations are the unit of analysis. The dependent variable is the Gini coefficient for legitimate earnings. All coefficients are statistically significant at p<.001, two-tailed.
Source: World Inequality Survey.

6. Population size and inequality: Mechanisms

Thus far, we have seen that population size has a strong bivariate relationship with legitimate inequality and that the effect remains strong when economic development is taken into account. That naturally raises the question of how and why this comes about. Let us begin by considering the effects of individual characteristics in determining what income people think legitimate and then proceed to examine how these effects vary according to population size.

6.1 What is important in shaping views about legitimate earnings?

6.1.1 Model. In thinking about income inequality, it is useful to consider how income is generated (Welch 1999). A simple description would be something like:

(Eq. 3) $$Income = a_0 + a_1 Ed + a_2 Occ + a_3 Super + a_4 Solo + a_5 Bz + e$$

This is a conventional model where actual earnings are a function of education, occupation, supervision, self-employment, and business ownership (Blau and Duncan 1967; Robinson and Kelley 1979; Yun 2006).[5] The unit of analysis is individuals.

By analogy to this conventional model for actual income we propose a similar model for the income people consider legitimate:

(Eq.4) $$\ln LegitIncome = b_0 + b_1 Ed + b_2 Occ + b_3 Super + b_4 Solo + b_5 Bz + b_6 Earn + e$$

Again the unit of analysis is the individual. This model differs from its progenitor in that we take actual earnings to be a cause of legitimate income. As is usual in the inequality literature we analyze the natural logarithm of legitimate income (Jasso 1978; Kelley and Evans 1993), thus focusing on percentage changes. In practice, the model is robust across various specifications of the dependent variable: for example, the alternative of analyzing income relative to the unskilled wage in each country leads to the same substantive conclusions (results available on request.)

A promising first hypothesis is that the socio-economic characteristics that matter in the income determination process also influence ideal occupational earnings. Figure 3 gives the evidence from a series of OLS regressions giving the total effect of each variable and culminating in Eq. 4.[6]

6.1.2 Actual pay. By and large, almost everyone thinks they ought to earn more than they do – their actual earnings are about 72% of their legitimate earnings in the US, for example (see Table 1 above). But in addition, those who earn a lot believe that they *ought* to earn even more. The standardized effect, .41, is very large (Figure 3). Indeed, by far the largest influence on how much people think their job *ought* to be paid is how much they themselves *actually* earn.

However this is an upper bound estimate of the true effect, because it may well be that people's views about what is right for them to earn influence what they actually do earn rather than (as we have assumed) the other way around. For example, a self-employed businessman may pay himself only what he thinks is right; similarly, a consultant may charge only what she thinks is proper, not whatever the market will bear; and, in market societies, people can decline jobs that offer far less than they think is right for the job. If so, their pay is in part a consequence of their views about legitimate earnings.

6.1.3 Education and training. Education also matters, with highly-educated people believing that their jobs warrant more pay and poorly-educated people allowing that theirs warrant less. Prior research has

[5] For simplicity we neglect labor force experience. Its effect differs between nations and between men and women; catering for these differences adds complexity without materially affecting the issues at hand.

[6] We decompose effects into direct and indirect following the conventional logic (Alwin and Hauser 1975). We assume education is causally prior to occupational status; occupation, supervisor, solo self-employed, and business owner are next, all at the same causal level; and that all in turn influence earnings. These are the conventional assumptions in the Blau-Duncan paradigm (Robinson and Kelley 1979). The equations estimated are Eqs. 5 to 7 below except that the aggregate variable and the interactions are omitted.

documented strong effects of education on *actual* earnings throughout the world, from poor countries like Brazil (Haller and Saraiva 1992) to the very richest nations (Ganzeboom, Treiman, and Ultee 1991). The results in Figure 3 suggest that this familiar fact is fully in accord with people's normative views.

All in all, education is about half as important as actual earnings. This is mostly comes about *indirectly*: well educated people get better paying jobs and earn larger incomes for that and other reasons; these higher incomes then in turn legitimate their pay. That indirect effect comes to .14 in standardized terms. The rest, .08 in standardized terms, comes about *directly*, with better educated people feeling they are entitled to more pay than others with the same occupational status, supervisory responsibilities, business ownership, and actual incomes.

6.1.4 Occupation. Occupational status is a smaller, but still important influence, with a total effect of 0.16. Nearly half of this, 0.07, comes about indirectly, because people higher on the occupational ladder tend to earn higher incomes[7] and that leads them to feel that their jobs should be highly paid, and the fatter "half", 0.09, is a direct influence – even aside from how much they actually earn, people working in high status occupations feel that their jobs merit high pay.

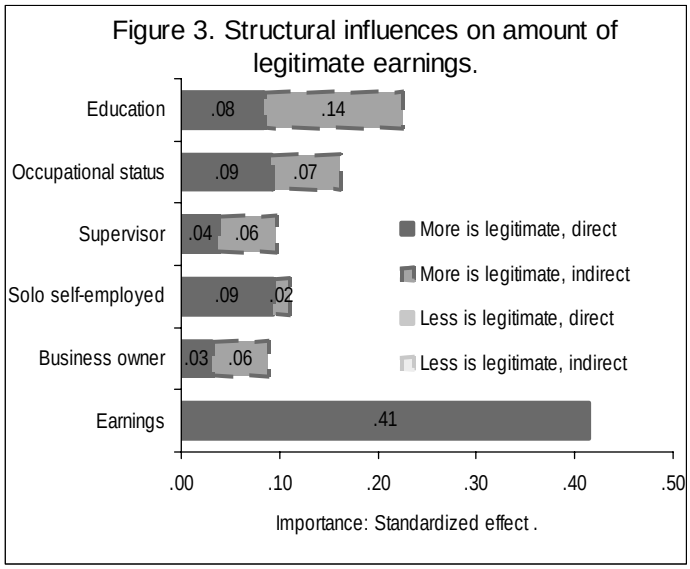


Figure 3. Structural influences on amount of legitimate earnings.

6.1.5 Other aspects. The other features of a person's work situation – Supervision, Solo self-employment, and Business ownership are less influential (Figure 3), contrary to expectations from Marx and Dahrendorf. We turn now to the key question: how is population size involved in all this?

6.2 How population size influences legitimate inequality

We do not argue that people in larger nations believe they are entitled to higher pay than comparable people in small nations. Neither Durkheim's nor Marx's arguments imply that. Moreover, in a eras of relatively free international trade – such as the end of the 19th century and the beginning of the 21st – competitive forces militate against it.

What we do suggest is that the legitimate returns to education, occupation, and other work characteristics are steeper in larger countries. Specifically that, in large societies where elites rarely know each other personally, the appreciation of differentiated functions, differentiated investments in training, and different levels of skill, all within an interdependent system where the performance of all the varied functions of society are essential to its success will lead people to recognize and accept differences in rewards – in short, Durkheim's "organic solidarity". By contrast, in small societies where elite families are likely to have some acquaintance, to have shared schools and friends, to socialize and to inter-marry,

[7] High status jobs tend to pay well, but not all do. For example, clerics have high occupation status but are poorly paid.

where specialization is less entrenched[8], and where elites more often perform multiple roles, there equalitarian feelings will be stronger and pay differences correspondingly smaller – Durkheim's "mechanical solidarity".

In investigating this we focus on the three most important individual-level influences on legitimate earnings: education, occupational status, and actual earnings.

6.2.1 Education. We estimate education's total effects, both direct and indirect, from:

(Eq.5) $$\ln LegitIncome = b_0 + b_1 Ed + b_2 PopSize + b_3 PopSize * Ed + e$$

where PopSize*Ed is the multiplicative interaction of education and population size. The equation is applied to individuals but, because population is a characteristic of countries rather than individuals, use of a multi-level model is required to get correct standard errors and significance tests (DiPrete and Forristal 1994; Hox 1995). Appropriate estimates, from Stata 9's xtreg routine, are shown in Appendix Table A3. The interaction effect is clearly significant ($p<.001$, two-tailed).

In small nations with a population around 5 million, each year of education increases legitimate income by about 5.1% (Table 4, first row). This is education's total effect, including those that come about indirectly through its influence on occupation, supervision, ownership, and actual earnings. In larger nations around 50 million in population, the effect is a little larger, 5.4%. And in large nations with populations around 250 million, the effect is larger yet, around 7.0% – or roughly half again its effect in small nations. This is one of the reasons there is more legitimate inequality in large nations than in small.

Table 4. Population size and legitimate earnings: Effects of education, occupation, and income are greater in populous nations. Total effects.[1]

		Population of nation		
Variable	Comparison	5 million	50 million	250 million
Education	1 additional year of education	5.1% more	5.4% more	7.0% more
Occupation	Higher professional (top) versus farm laborer (bottom)	38% more	42% more	64% more
Earnings	2 minimum incomes versus one minimum income[2]	17% more	22% more	48% more

[1] Estimated from the multi-level regressions in Appendix Table A3, based on Eqs. 5, 6, and 7.
[2] This is the average earnings of full-time unskilled male workers in respondent's nation, for example $29,000 in the USA.
Source: World Inequality Study, calculated from Appendix Table 3.

This pattern suggests that there may be more normative pressure toward inequality in small nations than in large. If education can be viewed as a productive investment undertaken for economic reasons, as economists' familiar human capital argument would have it (Becker 1975; Mincer 1958), then the optimal return to investments in education should be close to its effects on productivity. Objectively, in industrial societies a year of education increases productivity by something around 10% (Murphy and Welch 1994) and perhaps rather more in less developed nations. There is a great deal of evidence (beginning with Aristotle in the *Nicomachean Ethics*) that that ordinary people believe that rewards ought to reflect productivity, which suggests a return somewhere in the neighborhood of 10% should be viewed as legitimate. If all this is so, then the 7% we find legitimate in large nations is, if anything, a bit on the low side, and the 5% we find for small nations decidedly low. We therefore suspect that there are some normative pressures toward equality especially evident in smaller nations. Durkheim's "mechanical solidarity" based on likeness in smaller scale social organizations is a plausible candidate.

[8] For example, the specialist skills of the best mathematician, administrator, or politician out of a population of 5 million are not so unique, and hence so deserving of reward, as the specialist skills of the best mathematician, administrator, or politician out of a population of 250 million.

6.2.2. Occupation. We estimate occupation's effects, both direct and indirect, from:

(Eq.6) $$\ln LegitIncome = (Eq.5) + b4Occ + b_5 Super + b_6 Solo + b_7 Bz + b_8 PopSize * Occ + e$$

where PopSize*Occ is the multiplicative interaction of occupational status and population size and PopSize*Ed, as before, is the interaction of education and population size. Both are statistically significant in the multi-level analysis (p<.001, two-tailed; see Appendix Table A3).

On average, people in small nations believe that high ranking professional occupations at the top of the hierarchy should be paid 38% more than farm laborers at the bottom, other things being equal (Table 4, second row). But people in large nations believe 64% would be appropriate, more than half again as much. This is another reason there is more legitimate inequality in large nations than in small.

6.2.3 Actual earnings. We estimate the effect of actual earnings from:

(Eq.7) $$\ln LegitIncome = (Eq.6) + b_9 Earn + b_{10} PopSize * Earn + e$$

where PopSize*Earn is the multiplicative interaction of earnings and population size and the other interactions are as before. The earnings interaction is large and statistically significant (p<.001, two-tailed; see Appendix Table A3). But in this model, neither the educational nor the occupational interaction remain statistically significant; this implies that all their effects are indirect through earnings.

On average, people in small nations with a population around 5 million believe that earning an extra minimum income (i.e. the average wage of a full-time male unskilled worker in respondent's nation) increases one's legitimate earnings by only by 17% (Table 4, third row). In contrast, people in large nations believe that actually earning that much more increases one's legitimate earnings by 48%, almost three times what those in small nations thought proper. This is a major reason that there is more legitimate inequality in large nations than in small.

7. Implications

7.1 Difficulties for small nations

The finding that large population size implies increasing legitimate inequality has some important implications. First, if the European Union comes to be perceived by the populace of European nations as their "county", then their tolerance for inequality is likely to rise considerably.[9] By contrast, tolerance for inequality in disintegrating nations is likely to decline, which could pose barriers to economic growth. For example, as Scotland increasingly sees itself as an independent nation or should Iraq be divided into a loose federation of several small nations, tolerance for income inequality should decline.

For the developing world, the results suggest that small nations will face special challenges, insofar as their governments are responsive to public opinion: the problem is that actual inequality increases during the early stages of economic development as the first few people are able to claw their way out of poverty – the Kuznets curve (Nielsen 1994). Our model suggests that their citizens might well turn against inequality, and against the policies that both fuel economic growth and simultaneously growing inequality. If this happens before growth brings inequality down again, the result could be stagnation –

[9] Nonetheless there may also be a negative feed back – to the extent that the melding of Europe fuels economic growth, that will, in turn compress inequality ideals.

short term harmony at the cost of long term gains. Arguably, Singapore faced this problem a decade or two ago and Malaysia may face in now.

7.2 Credentialist and conflict theories of stratification

According to sociological functionalists, most economists, and almost all educators, schooling confers skills that enable people to do their jobs better – that is, education enhances productivity – and is rewarded for that reason. But a long "credentialist" or "signaling" tradition with adherents in both sociology and economics argues that education has no intrinsic effect on productivity; hence that (factually) it is not rewarded for that reason; and hence that (normatively) it provides no legitimate justification for inequality (Bourdieu and Passeron 1977; Brown 2001). Similar arguments harking back to Marx and Dahrendorf suggest that conflict and coercion, rather than skills and productivity, underlie the higher pay given to high status jobs, supervisors, and business owners (Robinson and Kelley 1979). The implication is that there is no moral justification for their rewards either.

Our results argue against these revisionist arguments for, if they were right, few people would find the rewards to education, occupation, supervision, and ownership morally legitimate. Less educated workers, those in low status occupations, and those who do not supervise would regard themselves as entitled to just as high pay as anyone else. But, as we have seen, they do not do that, instead accepting that their pay ought to be lower. In short, the stratification hierarchy is consensual, not imposed by coercion.

7.3 Legitimate inequality

Many policy makers now argue that the reduction of inequality should be as much a target of government policy as simple economic growth (e.g. Portes and Roberts 2005; Sen 1973; World Bank 2006). At times, this has been a major theme not only of the left – inequality and growth are major political issues in most Third World nations – but even of normally more conservative groups, such as the World Bank. Brazil, with one of the most unequal distributions in the world, has been especially singled out for condemnation (e.g. Velez, Barros, and Ferreira 2004). Our results provide strong new evidence, reinforcing earlier arguments both theoretical and empirical (Kelley and Evans 1993; Welch 1999), that a great deal of inequality is morally legitimate in the eyes of ordinary people. Ordinary people do *not* believe in the equal distribution of income, at least not in any country for which we yet have good evidence. Far from it: they believe in a great deal of inequality, inequality arising in good part from what they see as the legitimate rewards of education, occupational achievement, job performance, and financial success.

Brazil is a striking example. It has a very high level of inequality but Brazilians think it *ought* to have a very high level of inequality. In our data for full-time employees, the actual distribution of income has a Gini coefficient of .40 but the legitimate distribution is, if anything, even more unequal: .43. Outsiders might not like that, and many developmental economists at the World Bank certainly do not (Velez, Barros, and Ferreira 2004), but it would take a very authoritarian philosopher-king to wish to impose their personal views on an unwilling citizenry. Moreover, the attempt is likely to be futile in a democracy.

In place of the naive assumption that all inequality is bad, we suggest that one should compare how much income inequality there *actually* is with how much the nation's citizens think there *ought* to be. We offer such comparisons for 30 nations (based directly on our World Inequality Study survey data) and estimates (admittedly uncertain, using aggregate data to impute individual level preferences) for another 120

nations (Table 5). We suggest that these should be the beginning point for future assessments of income inequality.[10]

Table 5. Legitimate inequality in earnings for many nations: Gini coefficients. Entries based on survey data are in bold face type; others are estimates as described in the text. Also actual inequality in earnings where available, for comparison. Full-time employed persons.[1]

	Legitimate earnings	Actual earnings		Legitimate earnings	Actual earnings		Legitimate earnings	Actual earnings
Afghanistan	.38		Ghana	.37		Pakistan	.42	
Albania	.31		Greece	.27		Panama	.29	
Algeria	.36		Guatemala	.34		Papua New Guinea	.32	
Angola	.35		Guinea	.34		Paraguay	.31	
Azerbaijan	.34		Haiti	.34		Peru	.36	
Argentina	.32		Honduras	.33		**Philippines**	.41	.47
Australia	.23	.29	Hong Kong, China	.19		**Poland**	.35	.36
Austria	.22	.19	**Hungary**	.29	.29	**Portugal**	.28	.35
Bangladesh	.43		India	.48		Guinea-Bissau	.29	
Armenia	.32		Indonesia	.43		Puerto Rico	.21	
Belgium	.20		Iran	.38		Romania	.34	
Bolivia	.34		Iraq	.35		**Russia**	.45	.41
Bosnia & Herz	.29		Ireland	.21		Rwanda	.35	
Botswana	.27		**Israel**	.29		Saudi Arabia	.30	
Brazil	.43	.40	Italy	.27		Senegal	.35	
Bulgaria	.31	.39	Cote D'ivoire	.36		Sierra Leone	.34	
Myanmar	.40		Jamaica	.30		Singapore	.20	
Burundi	.35		**Japan**	.27	.33	**Slovakia**	.26	.30
Belarus	.33		Kazakhstan	.35		Viet Nam	.41	
Cambodia	.36		Jordan	.31		**Slovenia**	.23	.28
Cameroon	.36		Kenya	.39		Somalia	.34	
Canada	.24	.24	Korea, Rep (South)	.31		South Africa	.34	
Central Afr Rep	.32		Kuwait	.18		Zimbabwe	.35	
Sri Lanka	.36		Kyrgyzstan	.33		**Spain**	.19	.24
Chad	.35		Lao PDR	.33		Sudan	.38	
Chile	.34	.44	Lebanon	.31		**Sweden**	.15	.19
China	.48		Lesotho	.31		**Switzerland**	.20	.25
Colombia	.36		**Latvia**	.27	.36	Syrian Arab Rep	.35	
Congo, Dem Rep	.40		Liberia	.32		Taiwan	.25	
Congo, Rep	.32		Libya	.29		Tajikistan	.34	
Korea Dem (North)	.38		Lithuania	.30		Tanzania	.39	
Costa Rico	.28		Madagascar	.37		Thailand	.37	
Croatia	.30		Malawi	.36		Togo	.33	
Cuba	.33		Malaysia	.33		Trinidad	.25	
Cyprus (Greek)	.17	.24	Mali	.36		United Arab Emr	.18	
Czech Republic	.24	.27	Mauritania	.31		Tunisia	.33	
Benin	.34		Mauritius	.25		Turkey	.37	
Denmark	.18		Mexico	.38		Turkmenistan	.32	
Dominican Republic	.33		Mongolia	.31		Uganda	.38	
Ecuador	.35		Moldova	.32		Ukraine	.38	
El Salvador	.32		Morocco	.37		Macedonia	.29	
Ethiopia	.41		Mozambique	.37		West Bank & Gaza	.30	
Eritrea	.33		Oman	.23		Egypt	.39	
Estonia	.26		Namibia	.27		**United Kingdom**	.23	.27
Finland	.21		Nepal	.38		**Northern Ireland**	.22	.27
France	.30	.29	**Netherlands**	.19	.26	**United States**	.27	.32
Gabon	.26		**New Zealand**	.24	.26	Burkina Faso	.36	
Georgia	.33		Nicaragua	.32		Uruguay	.27	
Gambia	.29		Niger	.36		Uzbekistan	.37	
Germany-East	.21	.24	Nigeria	.43		Venezuela	.34	
Germany-West	.25	.28	**Norway**	.16	.22	Yemen	.37	

[1] In other studies, inequality is more commonly measured for family income rather than for individual earnings, and for all respondents rather than only for full-time workers. Such figures are normally higher than the figures shown here. Full-time is defined as working 30 hours or more.

Source: Bold face entries are from the World Inequality Study; other entries are projected from those using coefficients from an OLS regression predicting legitimate inequality in earnings on the basis of ln population size and GNP per capita.

[10] They should note be the end point however. In addition to having the *amount* of inequality they think is right, the inequality should arise from the sources they think right. That is, ideal and actual inequality should be closely correlated. Assessing that is a more complex task; Jasso has made a beginning (Jasso 1999).

8. Appendix:

Appendix Table A1. Sample selectivity: Probit analysis of selection into the sample of nations.[1]

	Metric	s.e.	t	Standard-ized[2]
Population of nation (millions)	.00069	.00106	ns	.03
GPD per capita (index; USA 1995=1.0)	.001	.001	4.87	.56
English speaking, English based law	.057	.550	ns	.03
Income inequality: Gini	-1.567	1.807	ns	-.07
Constant	-1.342	.804	ns	--
Pseudo R-squared	35%			

[1] Nations are the unit of analysis. N=155 nations with populations over 1 million, plus Cyprus.
[2] From the corresponding OLS analysis
ns -- Not statistically significant at p<.05, two-tailed.

Appendix Table A2. Sensitivity test using an alternative measure of inequality: Population size and the standard deviation of the log of the income people think proper for their own occupation. Aggregate results for N=30 nations, circa 1999-2000.[1]

	Metric	s.e.	t	Standard-ized
Population of nation (millions)	.00128	.00020	6.49	.59
GPD per capita (index; USA 1995=1.0)	-.368	.047	-7.78	-.71
Constant	.636	.032	20.09	.
R-squared	76%			

[1] Nations are the unit of analysis. The dependent variable is the Gini coefficient for legitimate earnings. All coefficients are statistically significant at p<.001, two-tailed.
Source: World Inequality Survey.

Appendix Table A3. Influences on (the natural log of) earnings thought legitimate for your own occupation. Multi-level regressions. N=20,933 respondents, employed full-time, in 30 nations.

	Eq. 1		Eq. 2		Eq. 3	
	Coef.	z	Coef.	z	Coef.	z
Interactions:						
Education X population	0.000078	4.26	0.000073	3.51	0.000000	ns
Occupation X population	--	--	0.000715	2.91	0.000296	ns
Earnings X population	--	--	--	--	0.000966	15.54
Country-level variable:						
Population of nation (millions)	-0.0010	ns	-0.0014	ns	-0.0012	ns
Individual characteristics:						
Education (years)	0.048	39.17	0.030	21.43	0.023	17.36
Occupational status (0 to 1)	--	--	0.316	18.93	0.224	14.43
Supervises (0/1)	--	--	0.165	22.20	0.100	14.50
Solo self-employed (0/1)	--	--	0.177	14.61	0.156	13.96
Business owner (0/1)	--	--	0.173	12.21	0.085	6.48
Earnings (# min. incomes)	--	--	--	--	0.151	39.69
(constant)	-0.012	ns	-0.02454	ns	-0.075	ns
Std. dev. of u	0.22		0.22		0.18	
Std dev of e	0.46		0.44		0.40	
rho (% of variance due to u)	0.19		0.21		0.16	

ns -- not significantly different from zero at p<.001
Source: World Inequality Study

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