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Morally Arbitrary Economic Advantage

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PREFACE

This working paper is one of a collection of papers, most of which were prepared for and presented at a festschrift conference to honor the life's work of Professor Thomas Weisskopf of the University of Michigan, Ann Arbor. The conference took place on September 30 - October 1, 2011 at the Political Economy Research Institute, University of Massachusetts, Amherst. The full collection of papers will be published by Elgar Edward Publishing in February 2013 as a festschrift volume titled, *Capitalism on Trial: Explorations in the Tradition of Thomas E. Weisskopf*. The volume's editors are Jeannette Wicks-Lim and Robert Pollin of PERI.

Since the early 1970s, Tom Weisskopf has been challenging the foundations of mainstream economics and, still more fundamentally, the nature and logic of capitalism. That is, Weisskopf began putting capitalism on trial over 40 years ago. He rapidly established himself as a major contributor within the newly emerging field of radical economics and has remained a giant in the field ever since. The hallmarks of his work are his powerful commitments to both egalitarianism as a moral imperative and rigorous research standards as a means.

We chose the themes and contributors for this working paper series, and the upcoming festschrift, to reflect the main areas of work on which Tom Weisskopf has focused, with the aim of extending research in these areas in productive new directions. The series is divided into eight sections, including closing reflections by our honoree himself, Professor Weisskopf. Each section except for the last includes comments by discussants as well as the papers themselves.

The eight sections are as follows:

1. Reflections on Thomas Weisskopf's Contributions to Political Economy
2. Issues in Developing Economies
3. Power Dynamics in Capitalism
4. Trends in U.S. Labor Markets
5. Discrimination and the Role of Affirmative Action Policies
6. Macroeconomic Issues in the United States
7. Applications of Marxist Economic Theory
8. Reflections by Thomas Weisskopf

This working paper is 3 of 4 included in Section 7.

- Jeannette Wicks-Lim and Robert Pollin

Morally Arbitrary Economic Advantage

Frank Thompson*

Doubtless humans have employed notions of morally arbitrary advantage (and disadvantage) for millenia. The locus classicus for these phrases is John Rawls's *A Theory of Justice*, e.g., "factors so arbitrary from a moral point of view" (1971, 72; 1999, 62) and "arbitrary from a moral perspective" (1971, 74; 1999, 64). (For this notion Rawls's quotes are surprisingly sparse considering the prodigious subsequent impacts.) The general idea is that there are some properties of each human individual that are not (or not at all easily) mutable by that individual but which can have profound effects, e.g., confer advantages and disadvantages, on that individual. Such properties are morally arbitrary in the simple sense that an individual cannot reasonably be held morally responsible for having (or for the consequences of having) such characteristics. Paraphrasing Rawls's related metaphor, we are all participants in social and natural lotteries we did not choose to play. Our individual starting points, opportunities, and outcomes depend in part on a social lottery (the political, social, and economic circumstances into which each person is born) and a natural lottery (the biological potentials each person is born with).[1]

Needless to say there is a voluminous philosophical literature addressing whether, and if so how, these notions can be made precise, and considering what implications employing these notions may have for moral (especially political) philosophy. It would be inappropriate to review that literature in this venue.[2] Here the project is much less general: to consider a matter of what is arguably morally arbitrary *economic* advantage or disadvantage, i.e., the amount of physical capital and the level of technology one works with.

Thus consider two individuals, i and j, supplying labor input L_i and L_j in perfectly competitive economies.

Where A_i and A_j are the levels of technology and K_i and K_j are the stocks of capital individuals i and j respectively work with, and h_i and h_j are their respective levels of human capital, their respective outputs will be $Y_i = A_i F(K_i, h_i L_i)$ and $Y_j = A_j F(K_j, h_j L_j)$.

Intended is a neoclassical aggregate production function with the standard formal properties (constant returns to scale with increasing but diminishing returns to factors, and the Inada conditions) augmented with a level of technology shift parameter and with a human capital index qualifying the labor input. Calling the shift parameter "technology" is of course sloppy (but common). It is the Solow residual, "total factor productivity," and thus "a measure of our ignorance."[3,4]

Under perfect competition each will be paid per unit of their labor supplied its marginal product, i.e.,

$$w_i = \partial Y_i / \partial L_i = A_i \left(\partial F(K_i, h_i L_i) / \partial (h_i L_i) \right) h_i$$

and

$$w_j = \P Y_j \Big/ \P L_j = A_j \left(\P F(K_j, h_j L_j) \Big/ \P (h_j L_j) \right) h_j.$$

* I am grateful for comments on earlier drafts by Tom Weisskopf, Fred Moseley, Jeannette Wicks-Lim, Amitava Dutt and others.

Now suppose that $A_i > A_j$ and $K_i > K_j$, e.g., individual i works with better technology and more capital than does individual j, but that $h_i = h_j$, i.e., i and j are clones in the quality of the labor they supply.

Under these circumstances it will be the case that $w_i > w_j$. Does individual i somehow deserve the extra $w_i - w_j$ per each unit of labor worked? (John Bates Clark would have thought so.)

More concretely, consider a Cobb-Douglas specification in which, $A_i = 2$, $A_j = 1$, $K_i = 2$, $K_j = 1$, $h_i = h_j = 1$, and $F(\cdot,\cdot) = (\cdot)^{1/3}(\cdot)^{2/3}$. Then $Y_i = 2 \cdot 2^{1/3} \cdot L_i^{2/3}$ and $Y_j = L_j^{2/3}$, and $w_i = \left((4/3)2^{1/3}\right)L_i^{-1/3}$ while $w_j = (2/3)L_j^{-1/3}$. If these clones, i and j, supply equal amounts of labor, $w_i / w_j = \left((4/3)2^{1/3}\right)/(2/3) = 2 \cdot 2^{1/3} = 2.52$, i.e., individual i receives a 152% higher return to labor supplied than does individual j.

Does individual i somehow deserve to enjoy a 152% higher return to labor supplied than individual j? Does individual j deserve to receive a 60% lower return to labor supplied than individual i? As Lant Prichett frames it, "The question is, how does the massive differential treatment of people who are alike in every respect except their affiliation with a particular nation-state, an essentially arbitrary condition of birth, square with any theory of justice?" (Prichett 2010, p. 281)[5]

Of course comprehensive data on the capital or technology used by individual workers is not available.[6] There is some sectoral data at least for the capital/labor ratio (the ratio is higher in petroleum refineries than in childcare facilities and the level of technology is doubtless higher as well), but there seems to be no comprehensive data set presenting the different capital/labor ratios (not to speak of levels of technology) by sectors in different countries. To move to international comparisons we must make do with country averages (even though software engineers in Bangalore doubtless work with technology and capital much more like that used in Silicon Valley than the Indian average) and thus move to the per-unit-of-labor version of the neoclassical production function with technology and human capital. Thus in the Cobb-Douglas specification output-per-unit-of-labor is:

$$Y = AK^a(hL)^{1-a}$$
$$Y/L = \left(AK^a(hL)^{1-a}\right)/L = A(K/L)^a h^{1-a}$$
$$Y/L = y;\ K/L = k$$
$$y = Ak^a h^{1-a}$$

And the marginal product of labor is: $mpl = Ak^a(1-a)h^{1-a}$.

More concretely, consider first only a couple of country comparisons, normalizing, $A_{US} = k_{US} = 1$ and assuming (a standard stylized fact) that uniformly $a = 1/3$.[7] A worker with country C's average level of technology and capital but supplying labor with the same level of human capital as a worker enjoying the US average level of technology and capital, will receive a wage rate only $A_C k_C^{1/3} \times 100\%$ of that of the US worker.

For India $A_{IN} = 0.39$ and $k_{IN} = 0.04$. (Data sources below.) Thus an Indian, supplying the same labor with the same level of human capital as a worker in the US, would receive a (marginal product) wage rate only 13.3% of that of the Indian's US clone. Or consider Zimbabwe with $A_{ZW} = 0.03$ and $k_{ZW} = 0.07$. A

Zimbabwen, supplying the same labor with the same level of human capital as a worker in the US, would receive a (marginal product) wage rate only 1.2% of that of the Zimbabwen's US clone.

It is not generally customary to place a relatively large spreadsheet in the body of the text of a paper instead of in an appendix, and it won't be done here. But in this case it is tempting to do so since understanding how the sheet is constructed (and pondering it) is crucial to understanding how the form of morally arbitrary economic advantage (and disadvantage) here at issue can be theorized and made empirically tractable (and to diminish page-flipping). In the appendix:

h' is average years of schooling of the population aged 15-64 (not studying) in 2010. Extracted from 2669521.xls at www.oecd.org. This seems to be the best comprehensive dataset available proxying for national average levels of human capital.[8]

h is the h' for each country divided by the h' for the US.

y' is GDP (PPP) per capita in 2010. Extracted from the IMF World Economic Outlook Database, April 2011.

y is the y' for each country divided by the y' for the US.

k' is physical capital per worker in 2000. Extracted from the Online Data Plotter (www.aw-bc.com/weil) accompanying Weil 2009.

k is the k' of each country divided by the k' of the US.

α is the capital share of GNI; (1-α) is the labor share. Numerals not in italics are extracted from Bernanke, 2002. The numeral in italics, i.e., *0.35*, is the world average according to Bernanke, 2002.

These y', k', α, and h' data provide most of the empirical basis for this paper.

A is the Solow residual, total factor productivity, calculated from $A = y/\left(k^{a} h^{1-a}\right)$.

mpl' is the marginal product of labor, calculated from $mpl = Ak^{a}(1-a)h^{1-a}$.

mpl is the mpl' of each country divided by the mpl', of the US.

mplc is the marginal product of labor relative to a US worker with the same human capital, i.e. a US clone, calculated from $mplc = Ak^{a}$.[9]

For the present topic the most interesting numbers are those for mplc, the marginal product of labor relative to a US worker with the same human capital, i.e. a US clone. (This is the source of the numbers for India and Zimbabwe in the example above.) Only Norway has a higher mplc than the US and Zimbabwe has the lowest in the sample. (Keep in mind that these numbers are derived in a model counterfactually assuming perfect competition.)

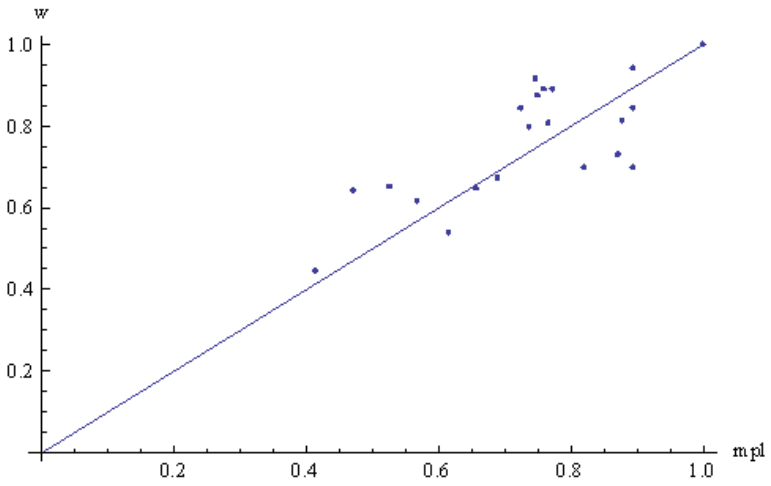
In order to have some idea how the output of this perfectly competitive market model compares to actuality one would like to compare the mpl of the model with country average wage data. Unfortunately there seems to be no such data set covering even most of the countries here under consideration. There is however a usable data set for the OECD countries.

w' is average annual wages (PPP) (full-time and full-time equivalent in total economy) in 2009. Extracted from OECDStatExtracts.

w is the w' of each country divided by the w' of the US.

There is a reasonably good fit between mplc and w for the OECD data set (see Figure 1, data in appendix).

Figure 25.1 Scatterplot of mpl and w for the OECD data set



But there is no strong reason to suspect it holds up so well for the larger sample including non-OECD countries.

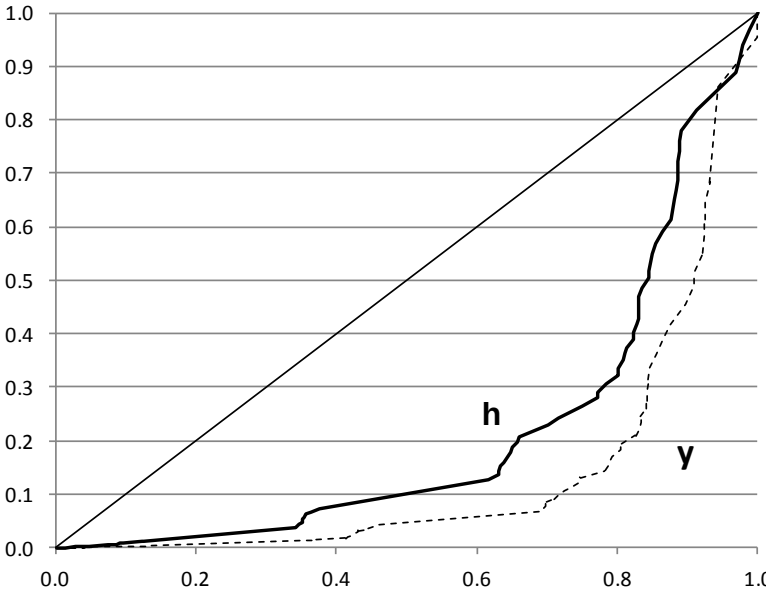
Our consideration thus far has been static. A dynamic puzzle is that although inequalities in educational achievement have been broadly and dramatically diminishing both between countries and within individual countries for decades (see World Bank 2006, Figure 3.4, Table 3.2, and Figure 3.5; and Barro 2010, Figure 1), international income inequality (an index constructed from country average incomes weighted by country populations) has been declining, but only because of the growth of average incomes in China and India, i.e., international inequality aside from China and India had grown precipitously in recent decades (see Milanovic 2005, Figure 8.3). And global income inequality (which in contrast to international income inequality takes into account within-country inequality) has been nearly level because of increasing within-country inequality (see World Bank 2005, Figure 3.9 and 3.10). The model here employed dictates that diminishing international inequality in human capital and increasing international inequality in income (setting China and India aside) are possible only if international inequality in technology levels and/or capital/labor ratios have increased. There seem to be no comprehensive empirical investigations of whether this has actually occurred. Such a study would be extraordinarily challenging to carry out.

Data are available to explore the current (static) relationships between inequalities in the international distribution (country averages) of y, h, k^{10}, and A. (It would be facinating to do a similar study for a single country, e.g., the U.S. at the state, county or congressional district, or even postal code level, if only the requisite data were available.)

One can construct and compare Lorenz curves for the distribution of each of y, h, k, and A. That is, where N is the population of each country[11], for each variable x one plots N/cumN on the abscissa and (x/cumx)(N/cumN) on the ordinate.[12, 13]

Thus,

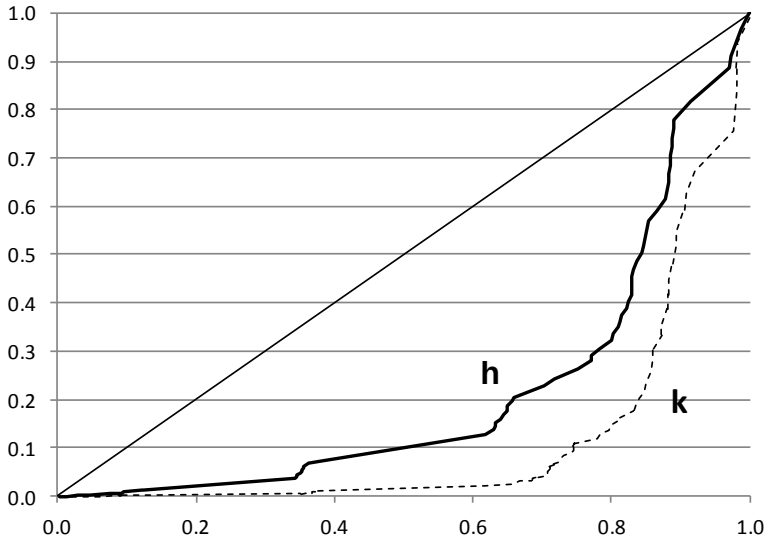
Figure 2. Lorenz curves for h and y



I.e, income is much more unequally distributed than human capital.

And:

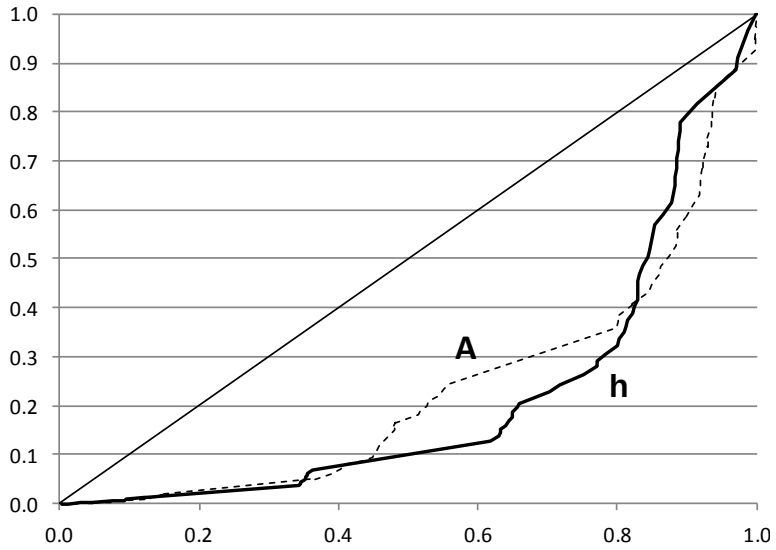
Figure 3. Lorenz curves for h and k



I.e., physical capital is much more unequally distributed than human capital.

And:

Figure 4. Lorenz curves for h and A



I.e., human capital is somewhat more unequally distributed than productivity in the middle of the distribution, but less unequally distributed higher in the distribution.

That human capital and total factor productivity track each other fairly closely is no surprise. One needs the human capital in order to operate the technology. Profoundly, what explains that income is much more unequally distributed than human capital is the inequality in the distribution of physical capital. Of course levels of human capital should be increased, which historically has been accompanied by decreasing inequality in the distribution of human capital. But one should focus on the fact that inequality in the distribution of physical capital available to workers is what fundamentally determines inequality in the distribution of income.

Reflecting now on this rudimentary model of the relation between levels of human capital and the return to labor and its application statically to a substantial set of recent data (as well as the suggestion for applying the model longitudinally—difficult as such a project would doubtless be empirically--), one can reasonably ask what the significance might be of such exercises.

Thus considering further Rawls: The most extensive exposition of his position on global justice (a term he would not accept for it) is Rawls 1999, his last work. Famously and controversially Rawls rejects general claims that morally arbitrary facts of nationality and access to technology and capital associated with nationality are morally problematic.[14] At the left pole on the spectrum from Rawls's nationalism are cosmopolitan positions. (To characterize Rawls's position as the right pole elides the fact that it is surely far to the left of median public opinion on global justice.) Positions between these poles are influentially occupied.[15]

The post-Rawlsian cosmopolitan locus classicus is Pogge 1989 (based on his 1983 doctoral dissertation for Rawls[16]). Pogge's views have continued to evolve (see Pogge 2008). Another especially influential proponent of cosmopolitanism is Darrel Moellendorf (see Moellendorf 2002). Of course there are a variety of positions which can be characterized as cosmopolitan. What they have in common is according at most instrumental

importance to nationality in formulating a defensible theory of justice. Recent literature on global justice is enormous.

I'll slip now at the end to the first person (which is not my wont; surely science should be third person (though a colleague now at Yale from Michigan, Steven Darwall (2009), argues that some moral science is essentially second-person)).

Most of this paper is (at least putatively) positive economics: math (thanks to Bob Solow) and stats (thanks to a horde of colleagues doing work I could not imagine doing). The positive part is (at least to me) quite fascinating, e.g., showing that differences in capital/labor ratios and levels of technology account for far more of differences in workers' outcomes than their differences in human capital. Another positive topic of great interest is the effect of the relation between the evolution of levels of international and global income inequality and the evolution of levels of human capital on migration pressures.[17]

But what are we to make of this normatively? (I am a moral realist; ethics is also (at least potentially) science.) I've thought about the normative part far more over a long time than I have the positive part. But I've made much less progress in coming to broad conclusions in the former.[18] My gut normative intuition is that, ceteris paribus, human capital clones should have the same opportunities to flourish. But many disagree. And whether such equal opportunity is somehow feasible is questionable. It might be only an optimistic hope that such can be.[19]

DATA APPENDIX

Table A.1. Country Data

COUNTRY	h'	h	h/ sumh	y'	y	y/ sumy	k'	k	k/ sumk	α	A	A/ sumA	mpl'	mpl	mplc	w'	w
Algeria	7.23	0.55	0.012	6,950	0.15	0.006	26530	0.18	0.007	0.39	0.417	0.009	0.07	0.10	0.228		
Argentina	8.80	0.66	0.014	15,854	0.34	0.014	54440	0.36	0.015	*0.35*	0.623	0.014	0.19	0.26	0.437		
Australia	13.25	1.00	0.021	39,699	0.84	0.035	1E+05	0.87	0.036	0.32	0.879	0.020	0.57	0.77	0.836	45,385	0.894
Austria	11.70	0.88	0.019	39,634	0.84	0.035	2E+05	1.01	0.042	0.30	0.911	0.021	0.57	0.76	0.915	41,109	0.809
Bangla-desh	5.03	0.38	0.008	1,572	0.03	0.001	3408	0.02	0.001	*0.35*	0.234	0.005	0.02	0.02	0.062		
Belgium	11.42	0.86	0.018	36,100	0.76	0.032	2E+05	1.06	0.044	0.26	0.840	0.019	0.54	0.73	0.856	40,616	0.800
Benin	2.73	0.21	0.004	1,451	0.03	0.001	2149	0.01	0.001	*0.35*	0.378	0.009	0.01	0.02	0.086		
Bolivia	8.74	0.66	0.014	4,592	0.10	0.004	8006	0.05	0.002	0.33	0.337	0.008	0.06	0.08	0.121		
Brazil	8.19	0.62	0.013	11,239	0.24	0.010	31560	0.21	0.009	*0.35*	0.560	0.013	0.13	0.18	0.325		
Burkina Faso	1.50	0.11	0.002	1,360	0.03	0.001	2373	0.02	0.001	*0.35*	0.506	0.011	0.01	0.01	0.119		
Burundi	2.41	0.18	0.004	411	0.01	0.000	945.7	0.01	0.000	0.25	0.111	0.003	0.00	0.01	0.019		
Cameroon	4.92	0.37	0.008	2,170	0.05	0.002	4458	0.03	0.001	*0.35*	0.299	0.007	0.02	0.03	0.087		
Canada	13.30	1.00	0.021	39,057	0.83	0.035	1E+05	0.89	0.037	0.32	0.856	0.019	0.56	0.76	0.821	41,312	0.813
Chile	10.77	0.81	0.017	15,002	0.32	0.013	44280	0.30	0.012	0.41	0.590	0.013	0.17	0.23	0.386		
China	6.79	0.51	0.011	7,519	0.16	0.007	10130	0.07	0.003	*0.35*	0.630	0.014	0.08	0.11	0.246		
Colombia	7.81	0.59	0.012	9,566	0.20	0.009	16640	0.11	0.005	0.35	0.615	0.014	0.11	0.15	0.285		
Costa Rica	7.65	0.58	0.012	11,216	0.24	0.010	28840	0.19	0.008	0.27	0.552	0.013	0.15	0.20	0.310		
Côte d'Iv-oire	3.74	0.28	0.006	1,681	0.04	0.002	3749	0.03	0.001	0.32	0.273	0.006	0.02	0.02	0.075		
Denmark	12.32	0.93	0.020	36,450	0.77	0.033	1E+05	0.89	0.037	0.29	0.839	0.019	0.54	0.72	0.806	42,829	0.843
Dominican Republic	6.43	0.49	0.010	8,836	0.19	0.008	14240	0.10	0.004	*0.35*	0.680	0.015	0.09	0.13	0.299		
Ecuador	8.82	0.67	0.014	7,776	0.16	0.007	22190	0.15	0.006	0.55	0.564	0.013	0.06	0.08	0.289		
Egypt	8.04	0.61	0.013	6,354	0.13	0.006	6875	0.05	0.002	0.23	0.401	0.009	0.09	0.12	0.136		
El Salvador	5.53	0.42	0.009	7,430	0.16	0.007	9663	0.06	0.003	0.42	0.824	0.019	0.06	0.09	0.316		
Ethiopia	2.60	0.20	0.004	1,016	0.02	0.001	757.2	0.01	0.000	*0.35*	0.393	0.009	0.01	0.01	0.062		
Finland	12.28	0.93	0.020	34,585	0.73	0.031	1E+05	0.86	0.035	0.29	0.807	0.018	0.51	0.69	0.765	34,241	0.674

(continued on next page)

Table 25.A.1. Country Data (continued)

COUNTRY	h'	h	h/ sumh	y'	y	y/ sumy	k'	k	k/ sumk	*a*	A	A/ sumA	mpl'	mpl	mplc	w'	w
France	11.35	0.86	0.018	34,077	0.72	0.030	1E+05	0.96	0.040	0.26	0.816	0.018	0.51	0.69	0.805	37,050	0.730
Gabon	6.18	0.47	0.010	15,021	0.32	0.013	22330	0.15	0.006	*0.35*	1.014	0.023	0.16	0.21	0.521		
Ghana	5.64	0.43	0.009	2,615	0.06	0.002	2134	0.01	0.001	*0.35*	0.426	0.010	0.03	0.04	0.096		
Greece	10.73	0.81	0.017	28,434	0.60	0.025	91640	0.61	0.025	0.21	0.787	0.018	0.45	0.61	0.663	27,460	0.541
Guatemala	5.32	0.40	0.008	4,885	0.10	0.004	9537	0.06	0.003	*0.35*	0.489	0.011	0.05	0.07	0.187		
Honduras	5.71	0.43	0.009	4,417	0.09	0.004	9551	0.06	0.003	*0.35*	0.423	0.010	0.05	0.06	0.161		
India	5.32	0.40	0.008	3,339	0.07	0.003	6270	0.04	0.002	*0.35*	0.388	0.009	0.03	0.05	0.128		
Indonesia	7.99	0.60	0.013	4,394	0.09	0.004	12650	0.08	0.003	*0.35*	0.306	0.007	0.05	0.07	0.129		
Iran	6.66	0.50	0.011	10,865	0.23	0.010	34650	0.23	0.010	*0.35*	0.599	0.014	0.12	0.16	0.359		
Ireland	10.59	0.80	0.017	38,550	0.82	0.034	1E+05	0.68	0.028	0.27	1.063	0.024	0.56	0.76	0.931	45,166	0.889
Italy	11.02	0.83	0.018	29,392	0.62	0.026	1E+05	0.90	0.037	0.29	0.729	0.017	0.42	0.57	0.704	31,290	0.616
Jamaica	9.05	0.68	0.014	8,727	0.18	0.008	17570	0.12	0.005	0.40	0.546	0.012	0.10	0.13	0.258		
Japan	13.11	0.99	0.021	33,805	0.71	0.030	2E+05	1.16	0.048	0.32	0.686	0.016	0.48	0.65	0.723	32,816	0.646
Jordan	10.18	0.77	0.016	5,644	0.12	0.005	19580	0.13	0.005	0.36	0.294	0.007	0.07	0.09	0.144		
Kenya	6.52	0.49	0.010	1,662	0.04	0.001	2407	0.02	0.001	*0.35*	0.236	0.005	0.02	0.02	0.056		
Korea	13.34	1.01	0.021	29,836	0.63	0.027	91410	0.61	0.025	0.45	0.784	0.018	0.35	0.47	0.660	32,638	0.643
Madagascar	4.07	0.31	0.006	911	0.02	0.001	771.8	0.01	0.000	*0.35*	0.262	0.006	0.01	0.01	0.041		
Malawi	5.31	0.40	0.008	827	0.02	0.001	1507	0.01	0.000	*0.35*	0.158	0.004	0.01	0.01	0.032		
Malaysia	10.22	0.77	0.016	14,670	0.31	0.013	51180	0.34	0.014	0.34	0.530	0.012	0.19	0.25	0.364		
Mali	1.60	0.12	0.003	1,252	0.03	0.001	1659	0.01	0.000	*0.35*	0.504	0.011	0.01	0.01	0.104		
Mauritius	8.19	0.62	0.013	2,093	0.04	0.002	36390	0.24	0.010	0.43	0.107	0.002	0.02	0.03	0.065		
Mexico	8.43	0.64	0.013	14,430	0.31	0.013	42990	0.29	0.012	0.45	0.685	0.016	0.14	0.19	0.443		
Morocco	4.50	0.34	0.007	4,754	0.10	0.004	13400	0.09	0.004	0.42	0.518	0.012	0.04	0.05	0.223		
Mozambique	2.45	0.18	0.004	1,010	0.02	0.001	988.8	0.01	0.000	*0.35*	0.371	0.008	0.01	0.01	0.064		
Nepal	4.57	0.35	0.007	1,271	0.03	0.001	4746	0.03	0.001	*0.35*	0.179	0.004	0.01	0.02	0.054		
Netherlands	11.50	0.87	0.018	40,765	0.86	0.036	1E+05	0.91	0.037	0.33	0.978	0.022	0.55	0.74	0.946	46,615	0.918
New Zealand	12.48	0.94	0.020	26,966	0.57	0.024	98160	0.66	0.027	0.33	0.682	0.015	0.37	0.51	0.588		
Nicaragua	7.08	0.53	0.011	3,045	0.06	0.003	8301	0.06	0.002	*0.35*	0.266	0.006	0.03	0.05	0.097		
Niger	1.25	0.09	0.002	755	0.02	0.001	1399	0.01	0.000	*0.35*	0.380	0.009	0.00	0.01	0.074		
Nigeria	4.37	0.33	0.007	2,422	0.05	0.002	2741	0.02	0.001	*0.35*	0.427	0.010	0.02	0.03	0.105		

(continued on next page)

Table 25.A.1. Country Data (continued)

COUNTRY	h'	h	h/ sumh	y'	y	y/ sumy	k'	k	k/ sumk	a	A	A/ sumA	mpl'	mpl	mplc	w'	w
Norway	12.71	0.96	0.020	52,013	1.10	0.046	2E+05	1.14	0.047	0.39	1.070	0.024	0.66	0.89	1.122	42,921	0.845
Panama	9.12	0.69	0.015	12,578	0.27	0.011	34460	0.23	0.010	0.27	0.519	0.012	0.18	0.24	0.311		
Paraguay	7.03	0.53	0.011	5,202	0.11	0.005	16680	0.11	0.005	0.51	0.459	0.010	0.04	0.05	0.213		
Peru	9.01	0.68	0.014	9,330	0.20	0.008	27350	0.18	0.008	0.44	0.517	0.012	0.09	0.13	0.285		
Philippines	8.62	0.65	0.014	3,737	0.08	0.003	13490	0.09	0.004	0.41	0.273	0.006	0.04	0.05	0.118		
Portugal	7.89	0.60	0.013	23,223	0.49	0.021	79050	0.53	0.022	0.28	0.852	0.019	0.31	0.41	0.682	22,666	0.446
Romania	10.99	0.83	0.017	11,860	0.25	0.011	26890	0.18	0.007	*0.35*	0.516	0.012	0.15	0.21	0.283		
Senegal	2.96	0.22	0.005	1,819	0.04	0.002	2930	0.02	0.001	*0.35*	0.403	0.009	0.01	0.02	0.102		
South Africa	8.83	0.67	0.014	10,498	0.22	0.009	22700	0.15	0.006	0.38	0.584	0.013	0.12	0.16	0.302		
Spain	10.27	0.78	0.016	29,742	0.63	0.027	1E+05	0.75	0.031	0.33	0.819	0.019	0.39	0.52	0.742	33,193	0.654
Sweden	12.11	0.91	0.019	38,031	0.80	0.034	1E+05	0.75	0.031	0.23	0.920	0.021	0.61	0.82	0.833	35,672	0.702
Switzerland	12.57	0.95	0.020	41,663	0.88	0.037	2E+05	1.16	0.048	0.24	0.885	0.020	0.66	0.89	0.932	47,800	0.941
Syria	7.59	0.57	0.012	5,208	0.11	0.005	12900	0.09	0.004	*0.35*	0.373	0.008	0.06	0.08	0.158		
Tanzania	3.74	0.28	0.006	1,413	0.03	0.001	2051	0.01	0.001	*0.35*	0.305	0.007	0.01	0.02	0.068		
Thailand	8.50	0.64	0.014	9,187	0.19	0.008	34090	0.23	0.009	*0.35*	0.435	0.010	0.11	0.15	0.259		
Trinidad & Tobago	9.85	0.74	0.016	20,329	0.43	0.018	29980	0.20	0.008	0.31	0.868	0.020	0.27	0.37	0.495		
Turkey	6.89	0.52	0.011	13,464	0.28	0.012	28670	0.19	0.008	*0.35*	0.776	0.018	0.15	0.20	0.435		
Uganda	4.71	0.36	0.007	1,241	0.03	0.001	579	0.00	0.000	*0.35*	0.359	0.008	0.01	0.02	0.051		
United Kingdom	13.34	1.01	0.021	34,920	0.74	0.031	99520	0.67	0.027	0.25	0.813	0.018	0.55	0.75	0.705	44,580	0.878
United States	13.24	1.00	0.021	47,284	1.00	0.042	1E+05	1.00	0.041	0.26	1.000	0.023	0.74	1.00	1.000	50,787	1.000
Uruguay	8.98	0.68	0.014	14,296	0.30	0.013	30790	0.21	0.008	0.42	0.735	0.017	0.15	0.20	0.423		
Venezuela	7.25	0.55	0.012	11,829	0.25	0.011	32460	0.22	0.009	0.47	0.706	0.016	0.10	0.13	0.414		
Zambia	6.45	0.49	0.010	1,512	0.03	0.001	3647	0.02	0.001	0.28	0.152	0.003	0.02	0.03	0.041		
Zimbabwe	8.82	0.67	0.014	434	0.01	0.000	9816	0.07	0.003	*0.35*	0.031	0.001	0.01	0.01	0.012		
SUM		47.43	1.000		23.67	1.000		24.26	1.000		44.12	1.000					

[1] Many have come up empty-handed in a search for a definitive passage in Rawls's work specifying morally arbitrary characteristics. But the notion is there, and many have tried to paraphrase it. A good attempt: "[I]n the distribution of income and wealth people should not benefit from or be held morally responsible for, natural or social advantages or disadvantages they are born with." (Freeman 2007, p. 443.)

[2] Perhaps the most influential work since Rawls in this stream is that of Ronald Dworkin, especially his distinction between "option luck" (with hypothetical insurance against bad outcomes) and "brute luck" (no insurance) (Dworkin 2000). A more radical critique of Rawls's position (from the left) is that of G. A. Cohen, e.g., in Cohen 2001 and 2008. Also essential for understanding this terrain is work by Amartya Sen, e.g. Sen 2011.

[3] Of course some very interesting work is ongoing in the attempt to decompose the Solow residual into components less opaque and perhaps independently measurable. An approach is to set $A = T' E$ where T is the level of technology and E is (residual) efficiency, but measuring T is problematic. (See Weil 2009, p. 276.)

[4] Some vehemently reject use of the Solow aggregate production function framework. But no other comparably general and elaborated approach to matters here considered exits. And it does rather well in explaining the facts.

[5] The current paper and Pritchett 2010 are complements, not substitutes.

[6] But one strongly suspects what it would show. If one's clone has a better computer (higher A and K), one's clone can create more output per unit of labor expended.

[7] For an interesting look at α for the U.S. see Norris 2011.

[8] Thanks to Marcelo Soto at the Instituto de Análisis Económico at UAB (Barcelona) for the lead.

[9] This formula assumes that countries have the same α as the US, which is never quite the case. Dropping this assumption makes the formula more complex, i.e., $\left(Ak^{a}\left(1-a\right)h^{a_{US}-a}\right)/\left(1-a_{US}\right)$ which is a function of h (increasing if $a_{US} > a$, decreasing if $a_{US} < a$) and could be consequential when α varies substantially.

[10] In poor countries most ditches are dug with shovels, in rich countries rather with (air-conditioned-cab) backhoes.

[11] Most recent estimate. Extracted from wiki/List_of_countries_by_population.

[12] Cumx is the cumulative amount ordered (lowest to highest) of the variable up to x for this 79 country (80% of world population) sample.

[13] The underlying Excel and Mathematica files are available from the author.

[14] Rawls does argue that wealthy peoples (societies, not individuals) do owe a duty of assistance to "burdened societies" too poor to rise by their own efforts. Perhaps the most persuasive defense of Rawls's position is Freeman 2007, Chapter 10.

[15] The *Stanford Encyclopedia of Philosophy* entry "Cosmopolitanism" is helpful here (http://plato.stanford.edu/entries/cosmopolitanism/).

[16] Revised and published as Pogge 1989, providing an especially accessible exposition of Rawls's conception of "justice as fairness," while criticizing especially Rawls's restriction of the domain of justice as national.

[17] See for example World Bank, 2005, Figure 10.1, for evidence that wage rate differentials between countries net exporting workers and those net importing workers were enormously greater in the 1990s than in the 1870s.

[18] If one holds that the technology and capital available to individuals is morally arbitrary, the case for loosening immigration barriers is prima facie very powerful. See Pritchett, 2010, and Clemens, 2011. Of course there are other arguments for restricting immigration, e.g., that it can endanger the viability of unique national cultures, which must be considered. Perhaps the most influential proponent of the national cultural argument is David Miller (Miller, 2007).

[19] Cf.: "Although a form of altruism circumscribed parochialism is in our legacy, it need not be our destiny. The fact that altruism and parochialism may have a common evolutionary origin, whether cultural or genetic, does not mean that the two are inseparable."

(Bowles and Gintis, 2011, p. 147.) I.e., can we become nonparochial in our judgments of whether arbitrary differences in our access to capital and technology should affect the expected returns for using our human capital?