Beyond GDP?
Welfare across Countries and Time

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Comparing welfare across countries and over time

How successful is an economy at delivering the highest possible welfare for its citizens?

- Fundamental question at the heart of economic growth and development
- Per capita GDP is our standard (shortcut) answer
- Can we do better?

GDP per capita $\neq$ Welfare

Utility depends on:

- Consumption
- Life Expectancy
- Leisure
- Inequality
- ...

But GDP per capita "only" measures income...

Motivating Example 1: France vs. the U.S.

U.S. has higher private consumption

But compared to the U.S., France has:

- More leisure
- Less inequality
- More public consumption (percentage)
- Longer life expectancy

Which country delivers higher welfare, the U.S. or France?

Motivating Example 2: Growth in China

Income has been growing rapidly in China

Amidst the growth:

- Leisure has fallen
- Inequality has risen
- The saving rate has risen (bad, controlling for income!)
- Life expectancy has lengthened

Has welfare risen faster or slower than income in China?

What We Do

Assume:

- Perspective of one set of preferences (those of "Rawls")
- Popular functional form over consumption, leisure, lifespan
- Parameters to match U.S. consumption, leisure, value of life

Evaluate outcomes using a particular set of preferences:

- Expected utility "behind the Rawlsian veil" in each country-year
- Flow measure of welfare, not PDV
- Fraction of U.S. consumption which makes "Rawls" indifferent

Two approaches:

- Macro calculation: Macro data for 134 countries.
- Micro calculation: Household surveys for 5 countries.

Important Shortcomings of our Approach

Factors we do not capture

- Morbidity (other than through health spending)
- Quality of the natural environment
- Political freedoms
- Crime
- ....

But neither does income!

Summary of Results

- Income and welfare are highly correlated in both levels and growth rates.
- Nevertheless, differences between income and welfare are economically important:
  - Median deviation in levels is over 40 percent.
  - Median deviation in growth rates is about 1 percentage point.

Related Literature

Nordhaus and Tobin's "Measure of Economic Welfare"

- Consumption and Leisure in the U.S. over time
- No Inequality or Life Expectancy, no country comparisons

U.N. Human Development Index

- Adds [0,1] Income, Life Expectancy, Literacy
- Ravallion (2010) "mashup" critique

Becker, Philipson, and Soares (2005)

- Combines per capita GDP and life expectancy $\Rightarrow$"full income"
- Mainly focused on evolution of cross-section dispersion

Fleurbaey and Gaulier (2009)

- Full-income measure of life expectancy, leisure, and inequality
- OECD only, levels only, not consumption-based

Theory Underlying the Macro Calculations

Let Rawls “live” for a year as a random person in some country, facing their mortality rates and consumption/leisure distribution.

Overview of Welfare

Expected utility behind the Rawlsian veil of ignorance:

$$V(e, c, \ell, \sigma) = e\left(\bar{u} + \log c + v(\ell) - \frac{1}{2}\sigma^2\right)$$

Preferences

- Let C denote an individual's consumption.
  — Independent of age.
- Let ℓ denote leisure or time spent in home production.
- Flow utility in benchmark case

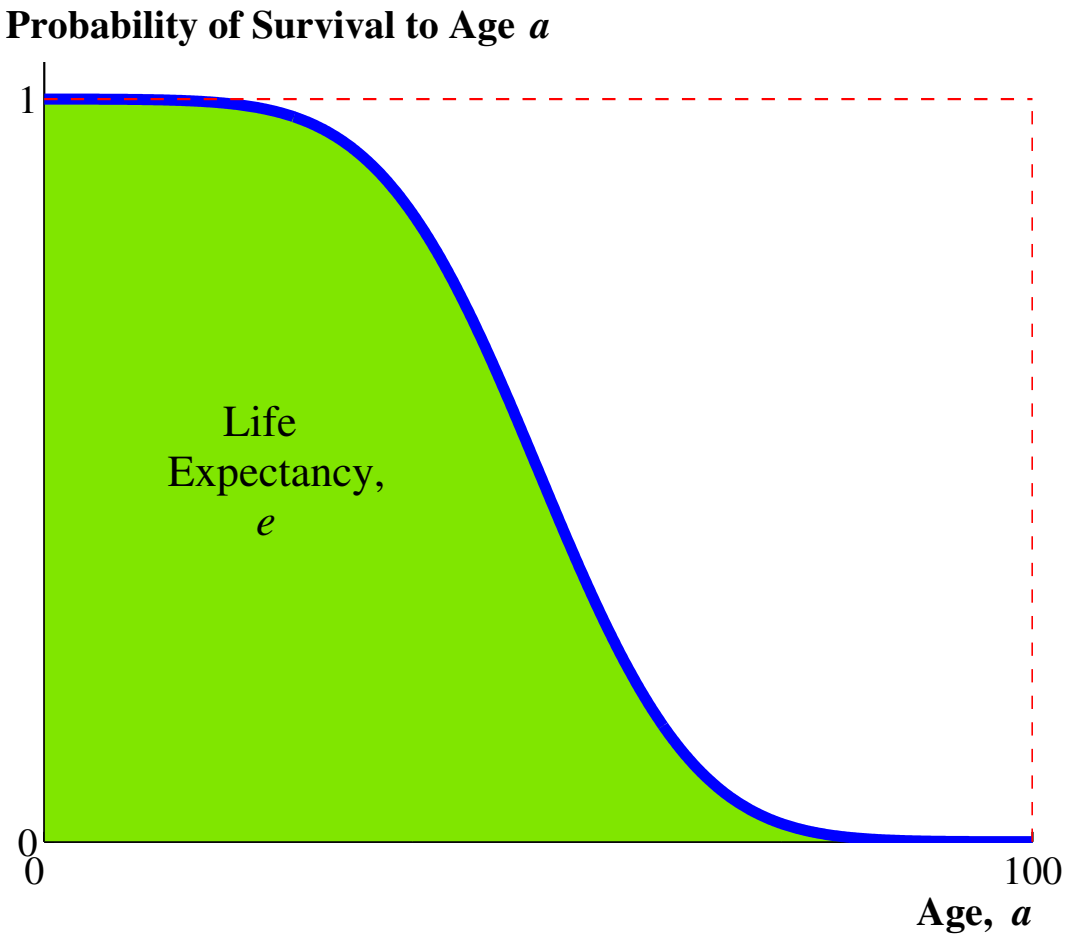
$$u(C, \ell) = \bar{u} + \log C + v(\ell)$$

- $\bar{u}$ influences the value of life given C, ℓ.

Life Expectancy

- Rawls draws age Uniform[0,100]
- Faces the *cross-sectional* mortality rates for 2000 in a country
- p = probability lives instead of dies

$$p = e/100$$



- Expected utility — normalizing death to be 0:

$$p \cdot u(C,\ell) + (1-p) \cdot 0 = e \cdot u(C,\ell)/100.$$

Inequality in Consumption

Suppose consumption C is log-normally distributed.

- Arithmetic mean c (consumption per capita).
- Standard deviation σ.

Conditional on being alive, expected utility from consumption is:

$$E[\log C] = \log c - \frac{1}{2} \cdot \sigma^2$$

Rawlsian Utility for a Country

Assumptions for Macro Calculation:

- Assume survival rates $S(a)$ are independent of consumption.
- Assume log-normal consumption independent of age.
- Assume no inequality in leisure.

Expected utility behind the Rawlsian veil of ignorance:

$$V(e, c, \ell, \sigma) = e\left(\bar{u} + \log c + v(\ell) - \frac{1}{2}\sigma^2\right)$$

Comparing Welfare Across Countries

What makes Rawls indifferent between the U.S. and country i?

One answer:

Scaling U.S. consumption by some proportion λ_i.

$$V(e_{us}, \lambda_i c_{us}, \ell_{us}, \sigma_{us}) = V(e_i, c_i, \ell_i, \sigma_i)$$

Decomposing Welfare Differences Across Countries

$$\log \lambda_i = \frac{e_i - e_{us}}{e_{us}} \left(\bar{u} + \log c_i + v(\ell_i) - \tfrac{1}{2}\sigma_i^2 \right) \quad \text{Life Expectancy}$$

$$+ \log c_i - \log c_{us} \quad \text{Consumption}$$

$$+ v(\ell_i) - v(\ell_{us}) \quad \text{Leisure}$$

$$- \tfrac{1}{2}(\sigma_i^2 - \sigma_{us}^2) \quad \text{Inequality}$$

As a *ratio* to per capita GDP

$$\log \frac{\lambda_i}{\tilde{y}_i} = \frac{e_i - e_{us}}{e_{us}}\left(\bar{u} + \log c_i + v(\ell_i) - \tfrac{1}{2}\sigma_i^2\right) \quad \text{Life Expectancy}$$

$$+ \log c_i/y_i - \log c_{us}/y_{us} \quad \text{Consumption Share}$$

$$+ v(\ell_i) - v(\ell_{us}) \quad \text{Leisure}$$

$$-\tfrac{1}{2}(\sigma_i^2 - \sigma_{us}^2) \quad \text{Inequality}$$

Equivalent vs. Compensating Variation

What makes Rawls indifferent between the U.S. and country i?

Alternative answer:

Scaling *foreign* consumption by some proportion λ_i.

$$V(e_{us}, c_{us}, \ell_{us}, \sigma_{us}) = V(e_i, c_i/\lambda_i, \ell_i, \sigma_i)$$

Decomposing Welfare based on Compensating Variations

$$\log \lambda_i = \frac{e_i - e_{us}}{e_i}\left(\bar{u} + \log c_{us} + v(\ell_{us}) - \tfrac{1}{2}\sigma^2_{us}\right) \quad \text{Life Expectancy}$$

$$+ \log c_i - \log c_{us} \quad \text{Consumption}$$

$$+ v(\ell_i) - v(\ell_{us}) \quad \text{Leisure}$$

$$-\tfrac{1}{2}(\sigma^2_i - \sigma^2_{us}) \quad \text{Inequality}$$

Baseline: report the geometric average of the compensating and equivalent variations.

Decomposing Welfare Differences *Across Time*

$$\log \lambda_{t,t+1} = \frac{e_{t+1}-e_t}{e_{t+1}}(\bar{u} + \log c_t + v(\ell_t) - \tfrac{1}{2}\sigma_t^2) \quad \text{Life Expectancy}$$

$$+ \log c_{t+1} - \log c_t \quad \text{Consumption}$$

$$+ v(\ell_{t+1}) - v(\ell_t) \quad \text{Leisure}$$

$$-\tfrac{1}{2}(\sigma_{t+1}^2 - \sigma_t^2) \quad \text{Inequality}$$

Baseline: report the geometric average of the compensating and equivalent variations.

Data / Calibration for the Macro Calculations

Macro Data Sources

Penn World Table 6.3 (National Accounts + World Bank ICP):

- Income
- Private consumption, government consumption
- Employment / adult population

World Bank:

- Life Expectancy

The Conference Board / OECD:

- Annual hours worked per worker

United Nations World Income Inequality Database:

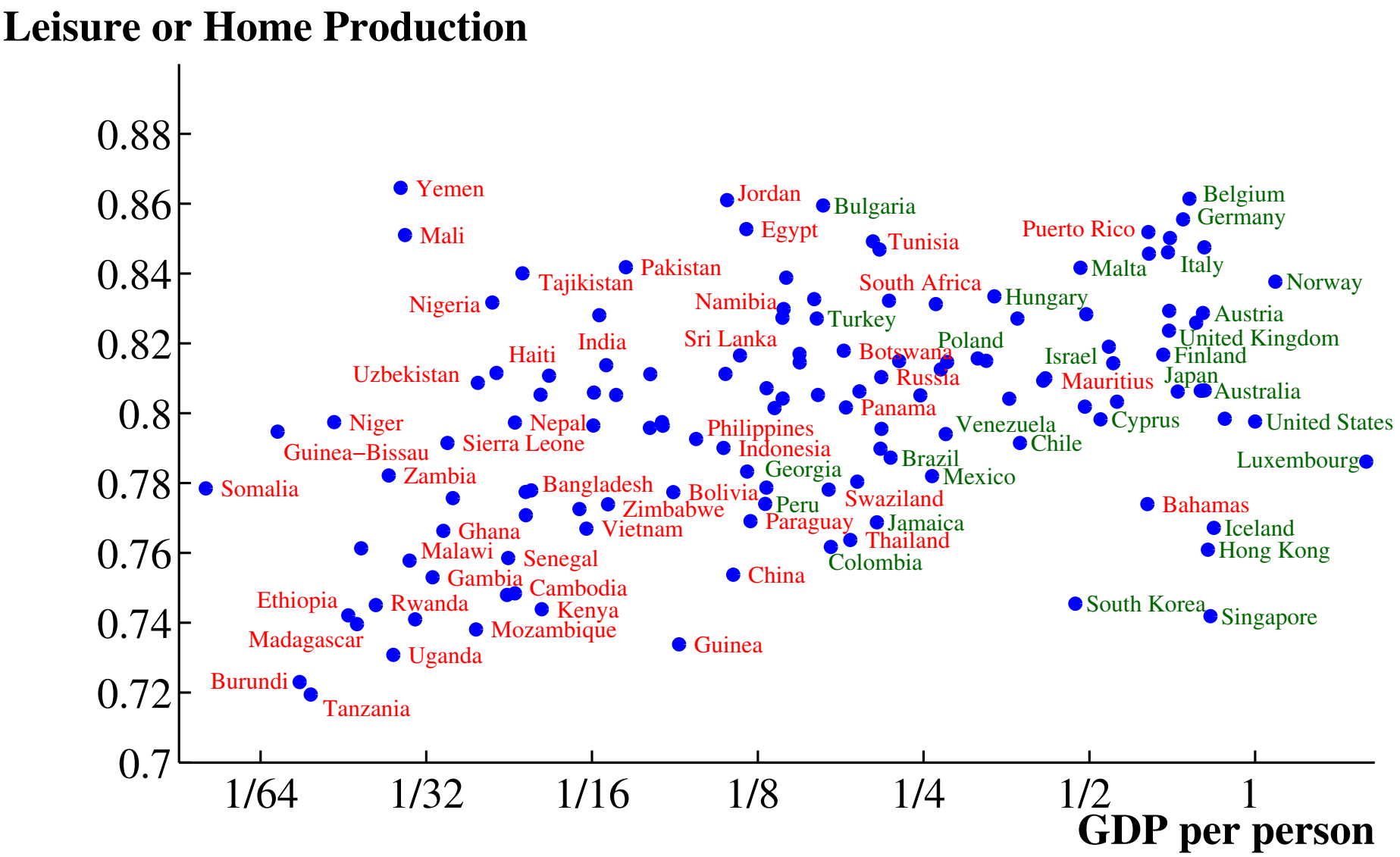
- Gini Coefficients

Leisure / Home Production

$$\ell = 1 - \frac{\text{annual hours worked per worker}}{16 \times 365} \cdot \frac{\text{employment}}{\text{adult population}}.$$

- Annual hours worked per worker
  - The Conference Board has data for 50 countries
  - Missing observations filled in with 2000 value or U.S. value.
- Employment per adult population
  - From Penn World Tables and World Bank
  - Implicitly assumes kids and adults have same leisure/hp.
- Micro calculation uses hours per year from household surveys, varying across people.

Leisure or Home Production



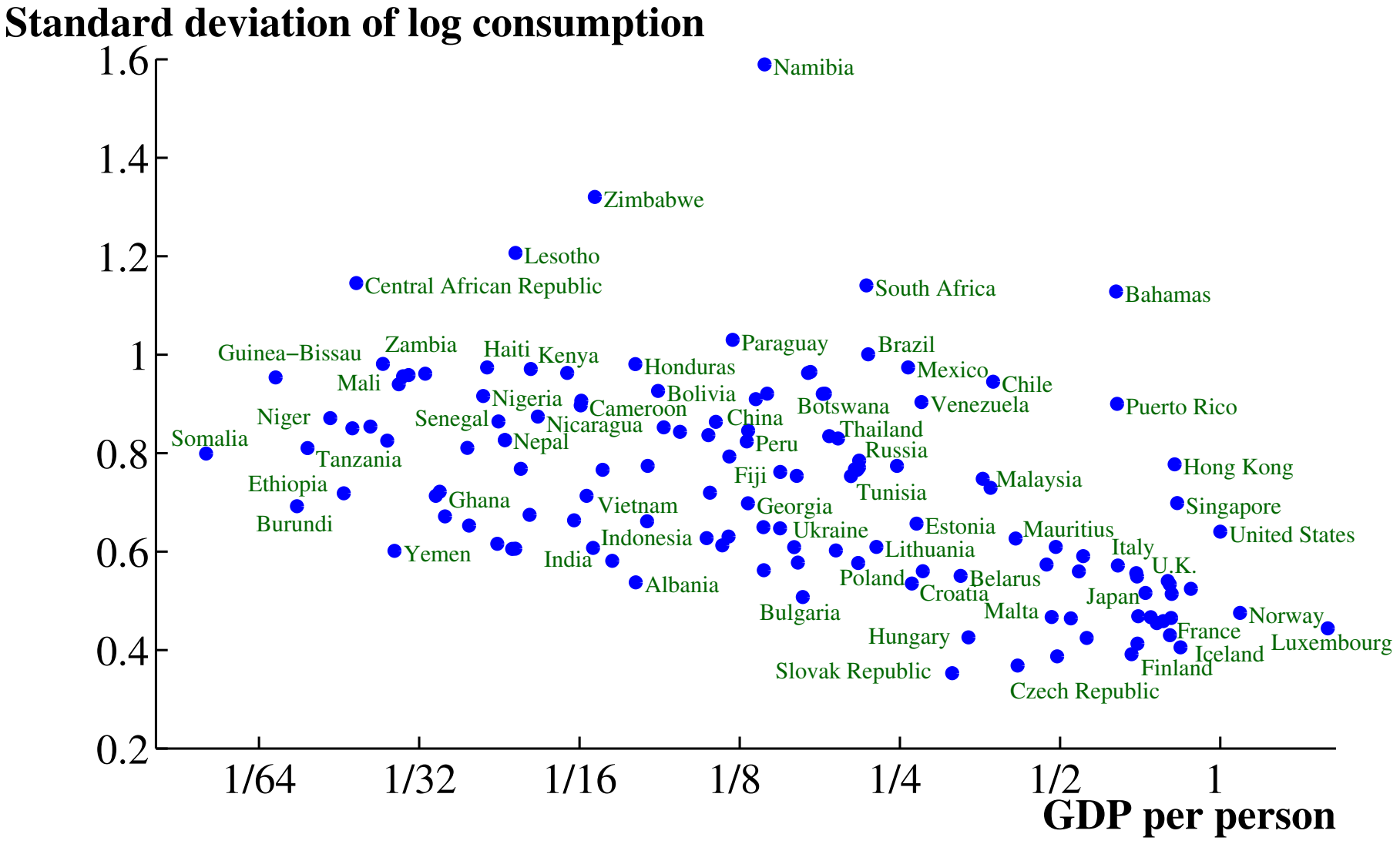
Gini Coefficients and σ^2

- When consumption is log normal, there's a one-to-one mapping between the gini coefficient and the standard deviation:

$$G = 2\Phi\left(\frac{\sigma}{\sqrt{2}}\right) - 1$$

- G is the value of the Gini coefficient.
- $\Phi(\cdot)$ is the cdf of the standard normal distribution.
- Invert to get σ

Within-Country Inequality



Calibrating the Utility from Leisure

- Assume $v(\ell) = -\frac{\theta\epsilon}{1+\epsilon}(1-\ell)^{\frac{1+\epsilon}{\epsilon}}$
- Frisch elasticity of labor supply is ϵ
  - Hall (2009a,b) surveys/reports a Frisch elasticity of 0.7 for intensive margin and 1.9 for both margins together.
  - We choose $\epsilon = 1$ for our baseline — results not sensitive
- Using the standard F.O.C.:

$$u_\ell / u_c = w \implies \theta = w(1-\tau)(1-\ell)^{-1/\epsilon}/c$$

- For the U.S.:

$$c \approx w(1-\ell),\ \tau \approx .387,\ \ell \approx .798 \implies \theta \approx 14.97$$

Calibrating the Intercept in Utility

Estimates of the value of remaining life for a U.S. 40-year old:

- Range from less than $2 million to more than $6 million.
- See Murphy and Topel (2006), Ashenfelter and Greenstone (2004), Viscusi and Aldy (2003), etc.

We calibrate to $4 million in our baseline case

- This requires $\bar{u} \approx 5.54$ if we normalize $C_{us,2000} = 1$
- Note: $\bar{u}$ raises the value of longevity relative to c, ℓ.

Example: Indifference Between Life and Death

- If willing to slash c to fraction f to stay alive, then:

$$\bar{u} + \log(f \cdot c) + v(\ell) = 0$$

- The solution for $\bar{u}$ is then:

$$\bar{u} = -\log(f \cdot c) - v(\ell)$$

$$\bar{u} \approx 5.54 \implies f \approx 0.0053$$

When consumption is 0.53% of the U.S. value, flow utility turns negative (at ℓ_{us}).

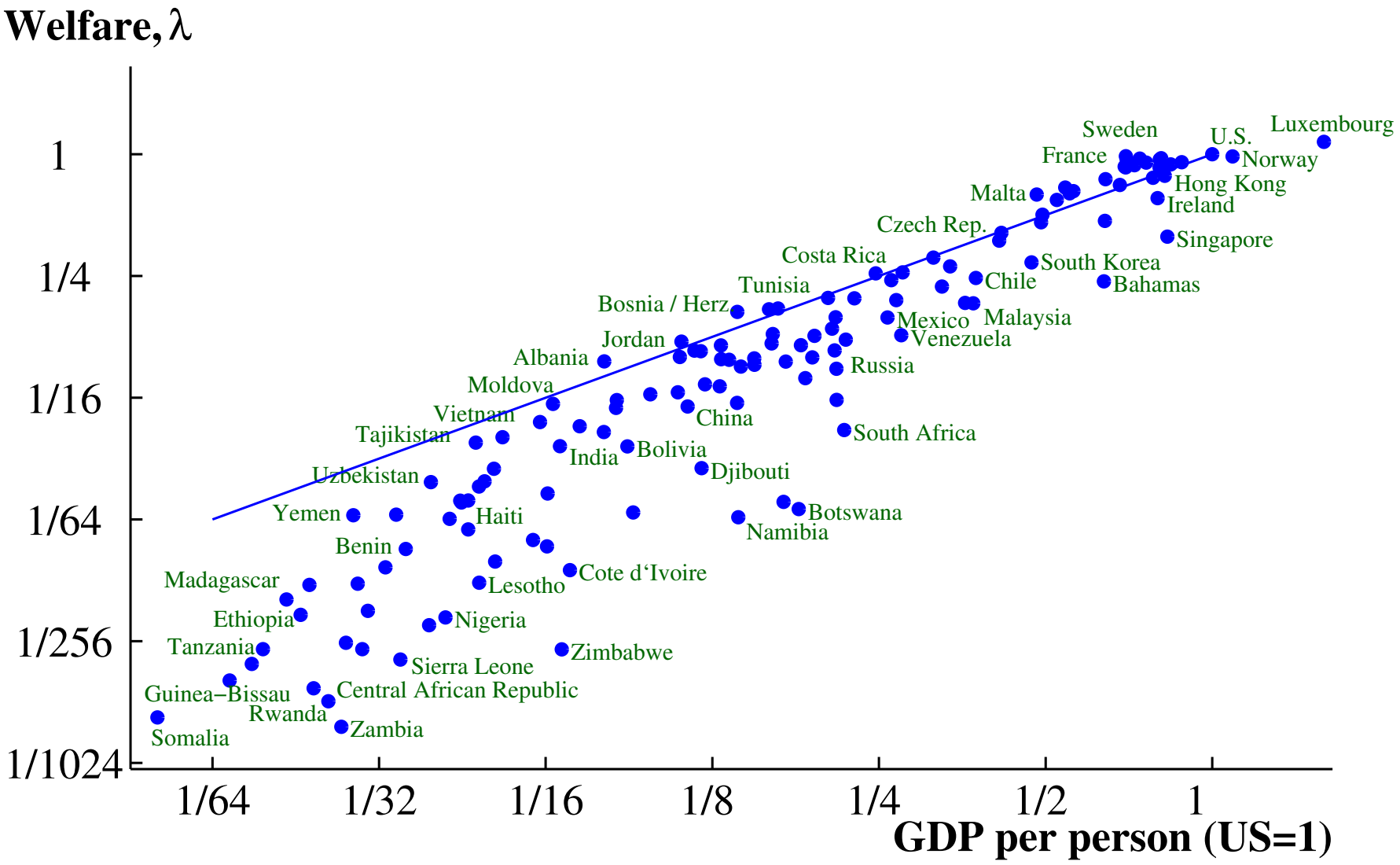
Main Results

Key Point 1:

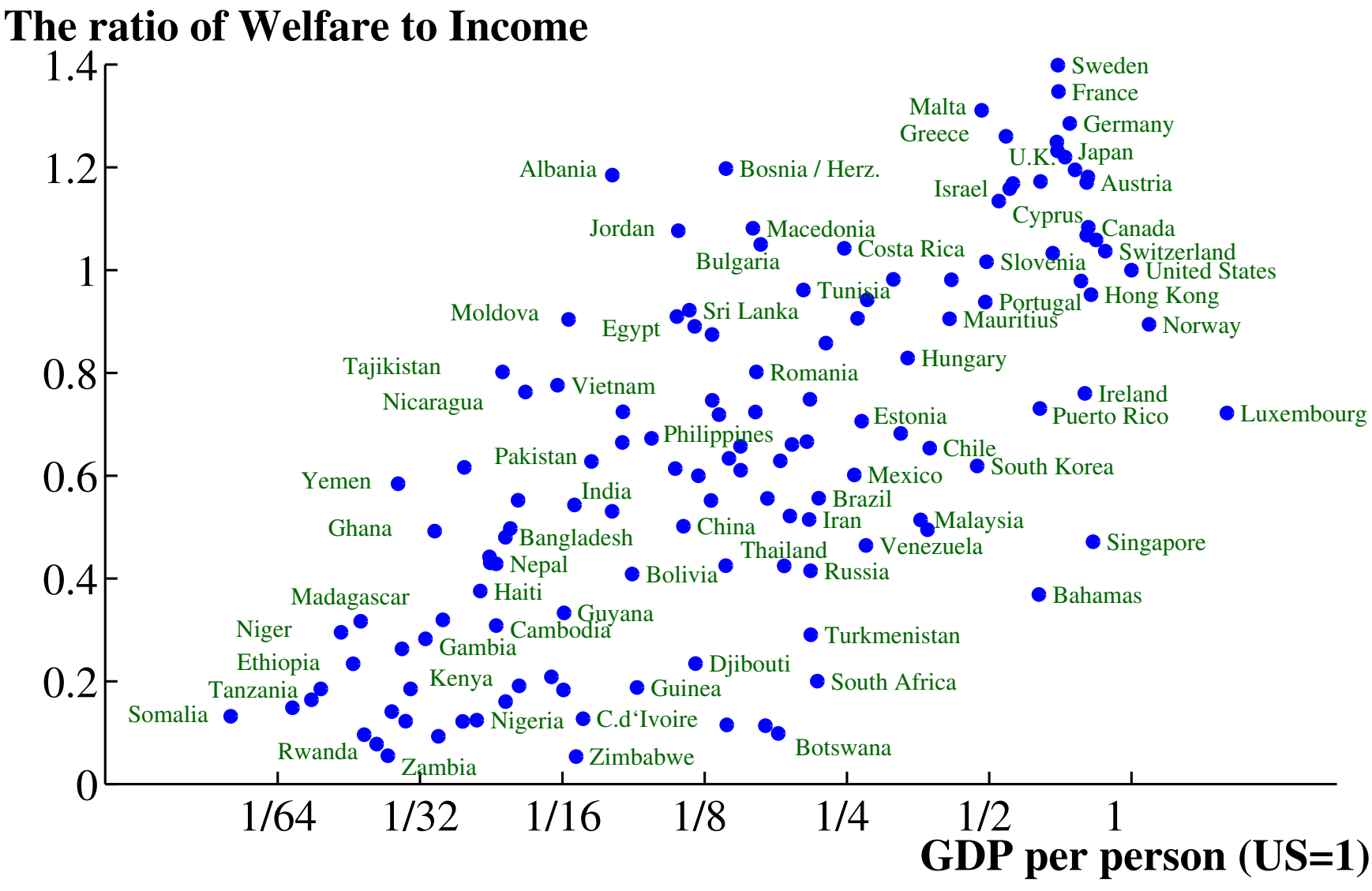
(a) GDP per person highly correlated with welfare across the broad range of countries: 0.95.

(b) Nevertheless, differences are often important: typical deviation is 46%.

Welfare and Income Are Correlated 0.95 in 2000



But Welfare typically differs from Income by about 46%



Key Point 2: Western Europe is much closer to the U.S. when we take into account Europe's longer life expectancy, additional leisure, and lower inequality.

U.S. vs. Western Europe in 2000

	Welfare λ	Income	Log Ratio	Life Exp.	*Decomposition* C/Y	Leis.	Ineq.
U.S.	100	100	.000	.000	.000	.000	.000
France	94.4	70.1	.298	.119	-.055	.139	.095

- Western Europe's high taxes and generous social safety net may reduce work effort and GDP.
- But these programs have *benefits* that are not measured by GDP...

U.S. vs. W. Europe in 2000

Green text indicates "raw" data.

	Welfare λ	Income	Log Ratio	*Decomposition* Life Exp.	C/Y	Leis.	Ineq.
U.S.	100.0	100.0	.000	.000	.000	.000	.000
				77.0	.762	.798	.640
Germany	95.1	74.0	.251	.057	-.053	.150	.096
				77.9	.722	.855	.466
France	94.4	70.1	.298	.119	-.055	.139	.095
				78.9	.721	.850	.468
Italy	86.8	69.5	.222	.155	-.113	.129	.051
				79.5	.681	.846	.556
U.K.	85.9	69.8	.209	.045	.036	.074	.054
				77.7	.789	.824	.549

Key Point 3: Many developing countries are much poorer than incomes suggest because of a combination of shorter lives and extreme inequality.

Welfare and Income, U.S. vs. Developed Asia in 2000

	Welfare λ	Income	Log Ratio	*Decomposition* Life Exp.	C/Y	Leis.	Ineq.
U.S.	100.0	100.0	.000	.000	.000	.000	.000
				77.0	.762	.798	.640
Japan	88.3	72.4	.199	.248	-.146	.025	.072
				81.1	.658	.806	.516
Hong Kong	78.1	82.1	-.049	.233	-.064	-.121	-.097
				80.9	.714	.761	.777
Singapore	39.1	82.9	-.752	.059	-.581	-.192	-.039
				78.1	.426	.742	.698
South Korea	29.2	47.1	-.480	-.069	-.273	-.178	.040
				75.9	.580	.745	.574

C/Y: 71% in Hong Kong vs. 43% in Singapore

Welfare and Income, U.S. vs. Emerging Asia in 2000

	Welfare λ	Income	Log Ratio	*Decomposition* Life Exp.	C/Y	Leis.	Ineq.
U.S.	100.0	100.0	.000	.000	.000	.000	.000
				77.0	.762	.798	.640
Thailand	7.8	18.4	-.857	-.492	-.111	-.111	-.143
				68.3	.682	.764	.834
Indonesia	6.7	10.8	-.488	-.530	.057	-.023	.008
				67.5	.806	.790	.627
China	5.7	11.3	-.690	-.287	-.088	-.147	-.168
				71.4	.698	.754	.863
India	3.6	6.6	-.610	-.826	.148	.047	.021
				62.5	.883	.814	.607

Welfare and Income, Other Emerging Markets in 2000

	Welfare λ	Income	Log Ratio	*Decomposition* Life Exp.	C/Y	Leis.	Ineq.
U.S.	100.0	100.0	.000	.000	.000	.000	.000
				77.0	.762	.798	.640
Mexico	15.6	25.9	-.508	-.171	-.018	-.049	-.269
				74.0	.748	.782	.974
Brazil	12.1	21.8	-.587	-.382	.123	-.032	-.296
				70.4	.861	.787	1.001
Russia	8.7	20.9	-.880	-.700	-.126	.037	-.092
				65.3	.672	.810	.771

Welfare and Income, Sub-Saharan Africa in 2000

	Welfare λ	Income	Log Ratio	Decomposition: Life Exp.	Decomposition: C/Y	Decomposition: Leis.	Decomposition: Ineq.
U.S.	100.0	100.0	.000	.000	.000	.000	.000
				77.0	.762	.798	.640
South Africa	4.3	21.6	-1.609	-1.382	.122	.096	-.445
				56.1	.861	.832	1.140
Botswana	1.8	17.9	-2.320	-1.989	-.171	.058	-.218
				48.9	.642	.818	.920
Malawi	.4	2.9	-2.100	-1.970	.254	-.132	-.252
				46.0	.982	.758	.956

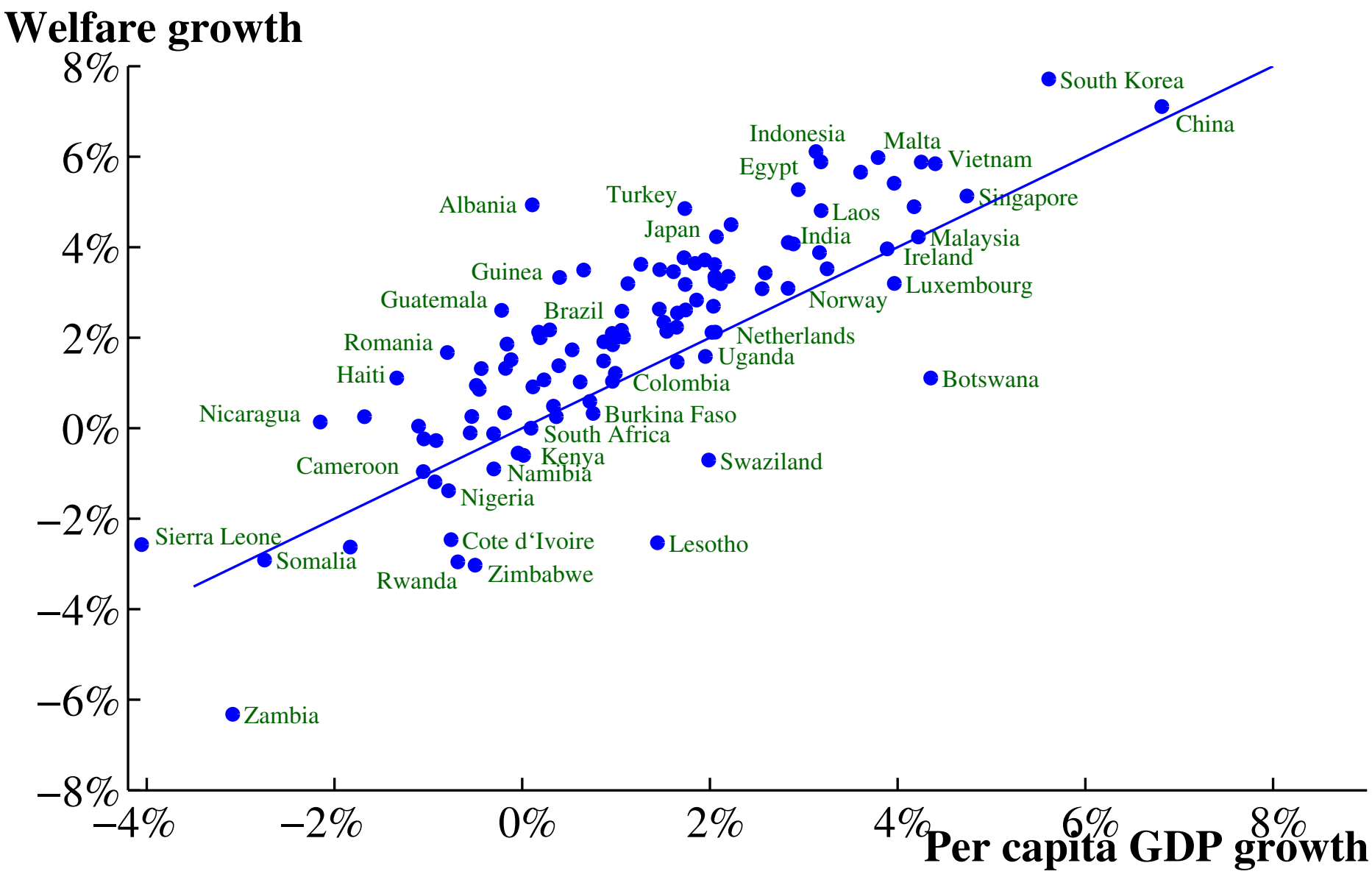
South Africa: Life expectancy = 56 years $\Rightarrow$ factor of 4!

Key Point 4: Growth rates, 1980–2000

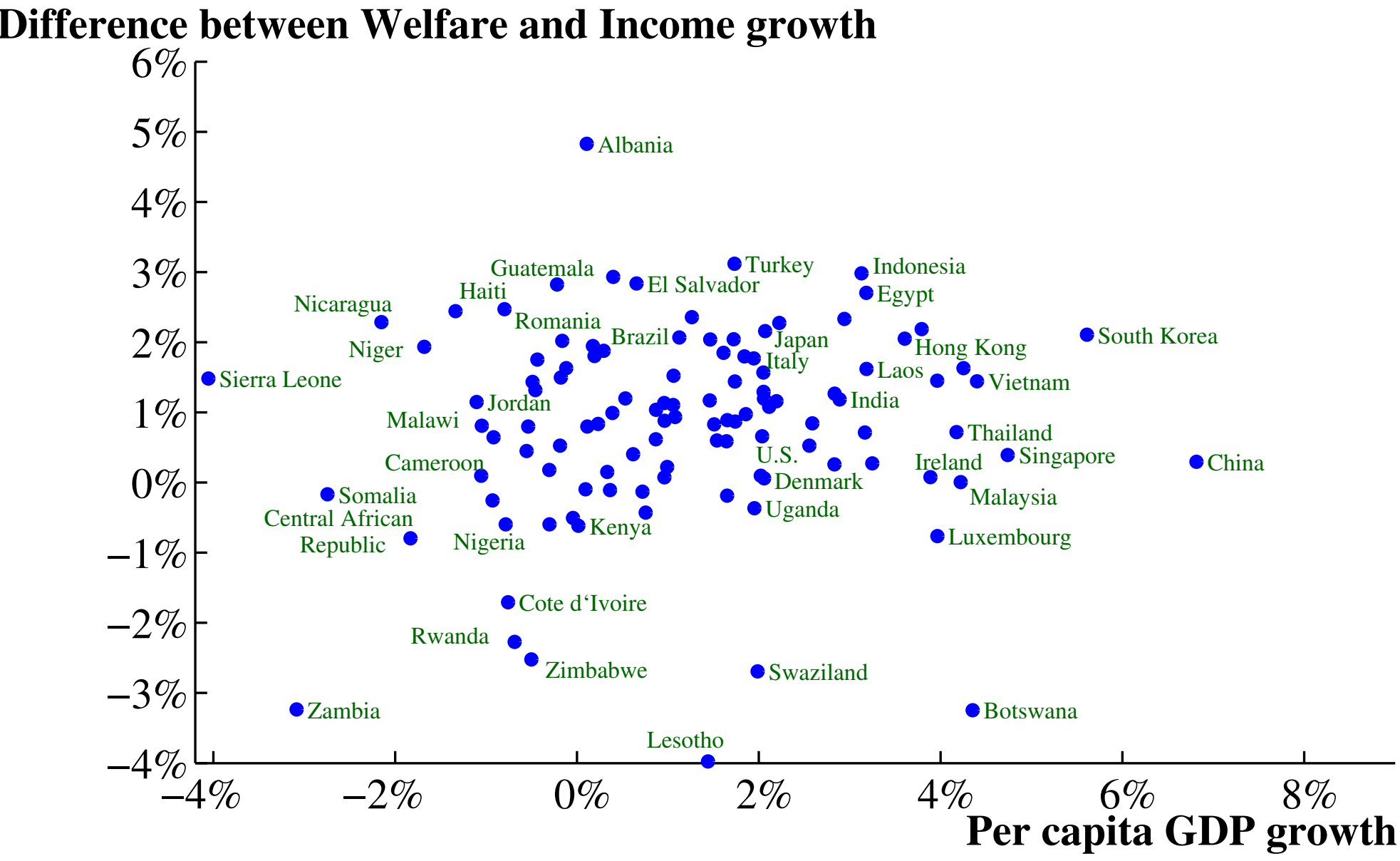
- Welfare: 4.0%
- Income: 3.0%

Life expectancy adds more than 1.0%, except in Africa

Welfare, Income Growth 1980–2000 Correlated 0.82



Welfare vs. Income Growth, 1980–2000



Key Point 5: The mean absolute deviation between welfare growth and income growth is 1.15 percentage points.

Welfare vs. Income Growth, Regional Averages

				Decomposition			
Country	Welfare λ	Income	Diff	Life Exp.	C/Y	Leis.	Ineq.
CoastAsia	5.59	4.61	0.98	1.24	0.03	0.09	-0.38
W. Europe	3.39	1.99	1.40	1.38	-0.14	0.17	-0.01
U.S.	2.70	2.04	0.66	1.09	-0.11	-0.16	-0.16
L.A.	1.70	0.30	1.39	1.80	0.07	-0.27	-0.20
SSAfrica	-0.44	-0.26	-0.18	0.15	-0.28	-0.00	-0.04

Welfare vs. Income Growth, Growth Stars

				Decomposition			
Country	Welfare λ	Income	Diff	Life Exp.	C/Y	Leis.	Ineq.
S Korea	7.72	5.61	2.11	2.45	-0.74	0.26	0.14
				65.8,75.9	.671,.580	.732,.745	.536,.481
China	7.11	6.81	0.29	0.87	-0.07	0.07	-0.57
				65.5,71.4	.708,.698	.750,.754	.429,.642
H.K.	5.66	3.61	2.05	1.67	0.42	0.43	-0.47
				74.7,80.9	.656,.714	.738,.761	.628,.763
Sing.	5.13	4.74	0.39	1.64	-0.91	-0.03	-0.30
				71.5,78.1	.511,.426	.744,.742	.574,.670
India	4.07	2.89	1.18	1.28	0.12	0.10	-0.32
				55.7,62.5	.862,.883	.806,.814	.565,.669

Welfare vs. Income Growth, U.S. and OECD

				Decomposition			
Country	Welfare λ	Income	Diff	Life Exp.	C/Y	Leis.	Ineq.
Japan	4.23	2.07	2.16	1.40	0.31	0.55	-0.10
				76.1,81.1	.618,.658	.771,.806	.458,.498
Italy	3.72	1.95	1.77	1.65	-0.09	0.15	0.06
				73.9,79.5	.693,.681	.834,.846	.561,.539
France	3.46	1.61	1.85	1.44	-0.09	0.36	0.13
				74.2,78.9	.734,.721	.821,.850	.502,.449
U.K.	3.35	2.19	1.16	1.25	-0.03	0.19	-0.25
				73.7,77.7	.794,.789	.810,.824	.417,.524
U.S.	2.70	2.04	0.66	1.09	-0.11	-0.16	-0.16
				73.7,77.0	.778,.762	.809,.798	.573,.628

Welfare vs. Income Growth, U.S. and OECD

				Decomposition			
Country	Welfare λ	Income	Diff	Life Exp.	C/Y	Leis.	Ineq.
Japan	4.23	2.07	2.16	1.40	0.31	0.55	-0.10
				76.1,81.1	.618,.658	.771,.806	.458,.498
Italy	3.72	1.95	1.77	1.65	-0.09	0.15	0.06
				73.9,79.5	.693,.681	.834,.846	.561,.539
France	3.46	1.61	1.85	1.44	-0.09	0.36	0.13
				74.2,78.9	.734,.721	.821,.850	.502,.449
U.K.	3.35	2.19	1.16	1.25	-0.03	0.19	-0.25
				73.7,77.7	.794,.789	.810,.824	.417,.524
U.S.	2.70	2.04	0.66	1.09	-0.11	-0.16	-0.16
				73.7,77.0	.778,.762	.809,.798	.573,.628

Welfare vs. Income Growth, Developing Countries

				Decomposition			
Country	Welfare λ	Income	Diff	Life Exp.	C/Y	Leis.	Ineq.
Brazil	2.12	0.18	1.95	1.94	0.23	-0.16	-0.06
				62.8,70.4	.822,.861	.798,.787	.878,.892
Mexico	1.73	0.53	1.20	1.77	-0.01	-0.39	-0.17
				66.8,74.0	.749,.748	.808,.782	.833,.872
Botswa.	1.11	4.35	-3.25	-2.76	-0.88	0.24	0.16
				60.5,48.9	.766,.642	.801,.818	.913,.878
SAfrica	-0.00	0.10	-0.10	-0.30	0.14	0.06	0.00
				57.2,56.1	.837,.861	.827,.832	1.140,1.140

Robustness Checks

Robustness

Key Points are all *qualitatively* robust.

Sensitivity of *magnitudes* in order of importance:

- CV versus EV
- $\bar{u}$ — U.S. value of life
- K/Y: current level versus steady state
- Coefficient of relative risk aversion
- Parameterization of utility from leisure

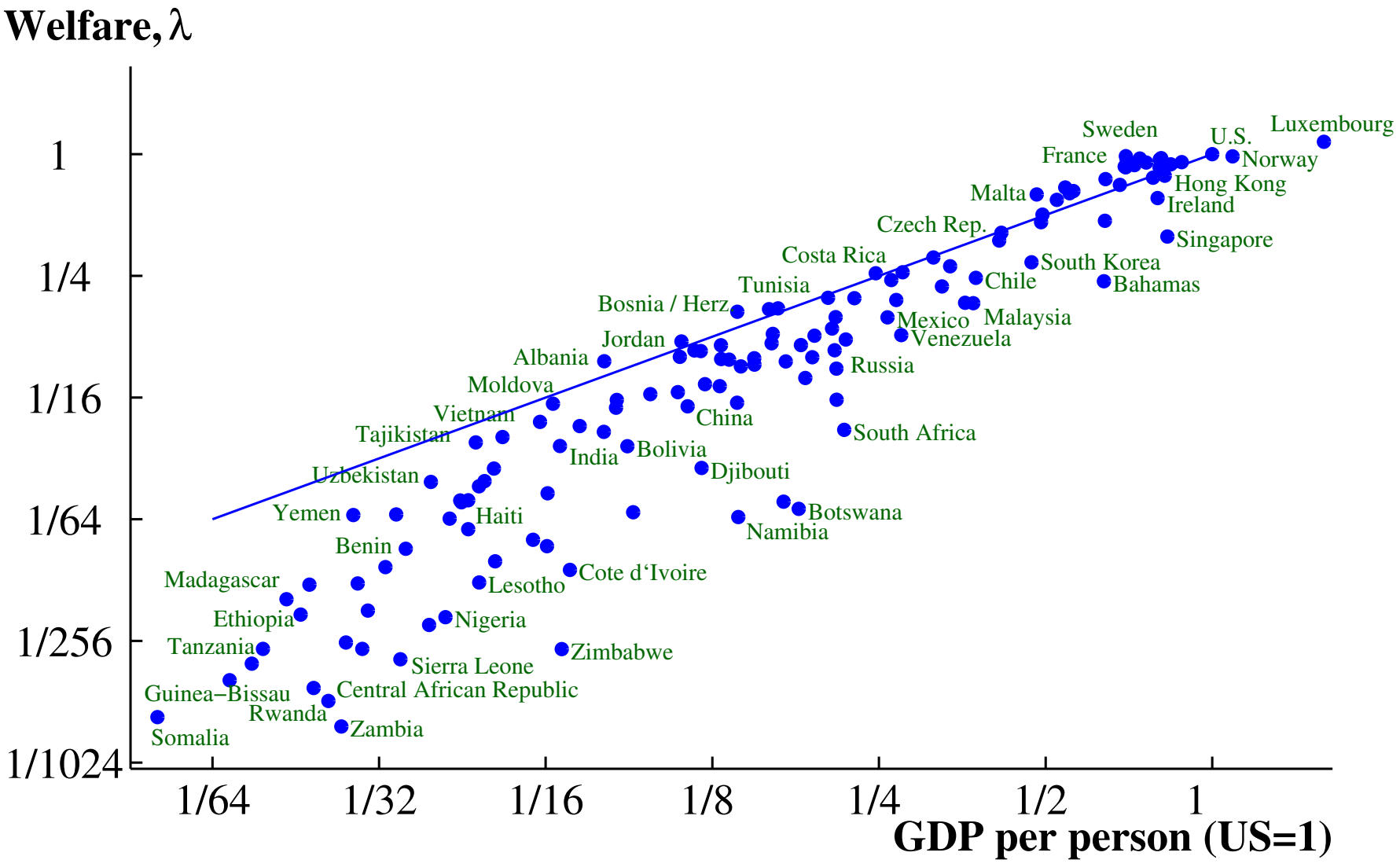
Robustness — Summary Results

Robustness check	— *Median absolute deviation* — Levels	Growth rate	# of countries with negative flow utility
Benchmark case	37.7	1.15	0
Equivalent variation	26.7	0.99	0
Compensating variation	44.4	1.24	0
$\gamma = 1.5, \bar{c} = 0$	33.7	0.66	53
$\gamma = 1.5, \bar{c} = .080$	36.3	0.81	6
$\gamma = 2.0, \bar{c} = .249$	38.7	0.99	4
θ from FOC for France	37.9	1.09	0
Frisch elasticity = 0.5	38.2	1.15	0
Frisch elasticity = 1.9	37.3	1.16	0
Value of Life = \$3m	27.4	0.62	11
Value of Life = \$5m	46.2	1.71	0

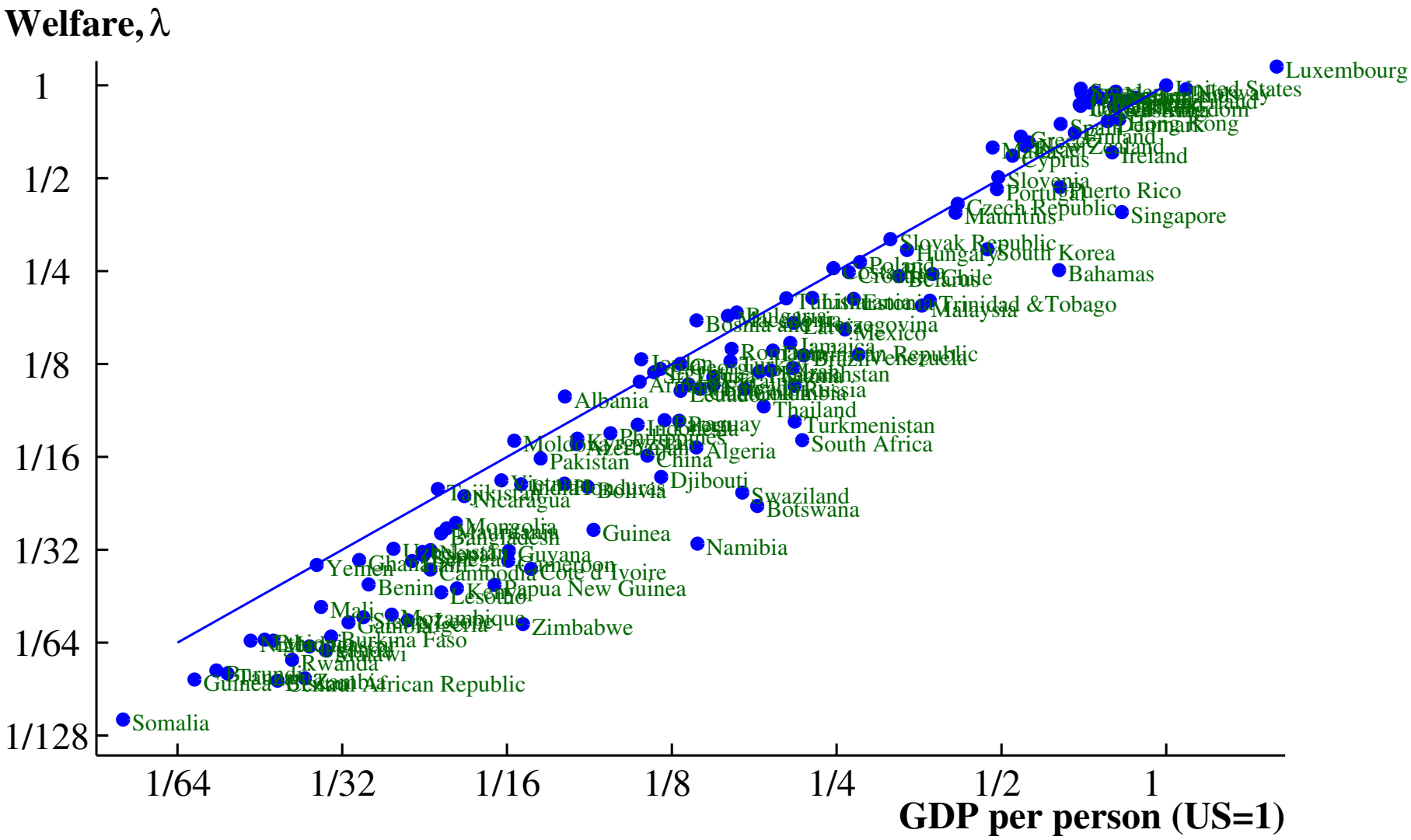
Robustness — France ($y = 70.1$)

Country	Welfare λ	Log Ratio	*Decomposition* L.E.	C/Y	Leis.	Ineq.
Benchmark case	94.4	0.298	0.119	-0.055	0.139	0.095
Equivalent variation	94.3	0.297	0.118	-0.055	0.139	0.095
Compensating variation	94.5	0.299	0.120	-0.055	0.139	0.095
$\gamma = 1.5, \bar{c} = 0$	98.2	0.338	0.098	-0.055	0.151	0.143
$\gamma = 1.5, \bar{c} = .080$	98.3	0.339	0.108	...	0.160	0.124
$\gamma = 2.0, \bar{c} = .249$	101.2	0.367	0.106	...	0.182	0.132
θ from FOC for France	105.3	0.408	0.114	-0.055	0.253	0.095
Frisch elasticity = 0.5	92.8	0.281	0.119	-0.055	0.121	0.095
Frisch elasticity = 1.9	95.3	0.308	0.119	-0.055	0.148	0.095
Value of Life = \$3m	91.3	0.264	0.085	-0.055	0.139	0.095
Value of Life = \$5m	97.6	0.332	0.153	-0.055	0.139	0.095

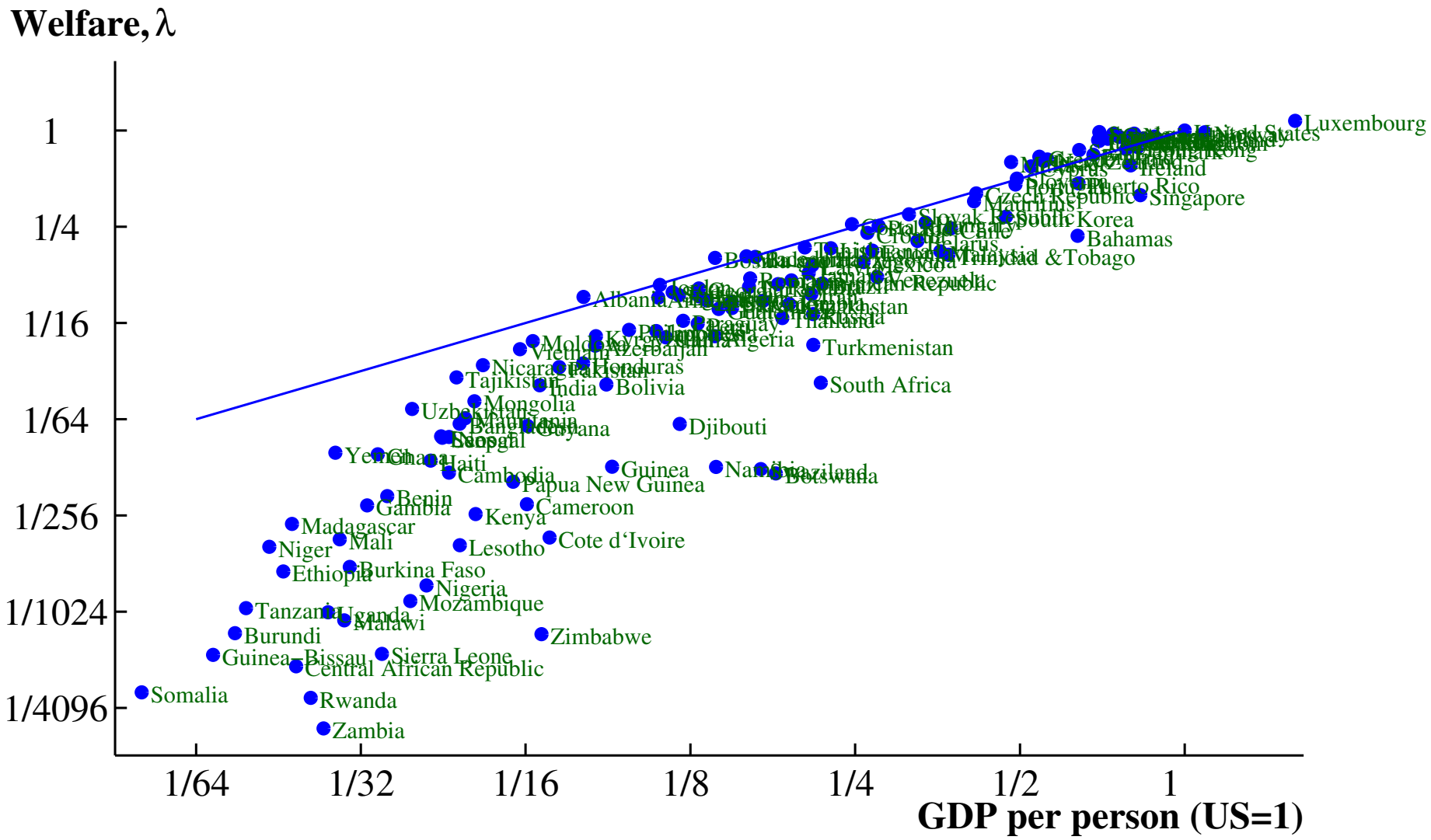
Baseline Welfare Measure, 2000



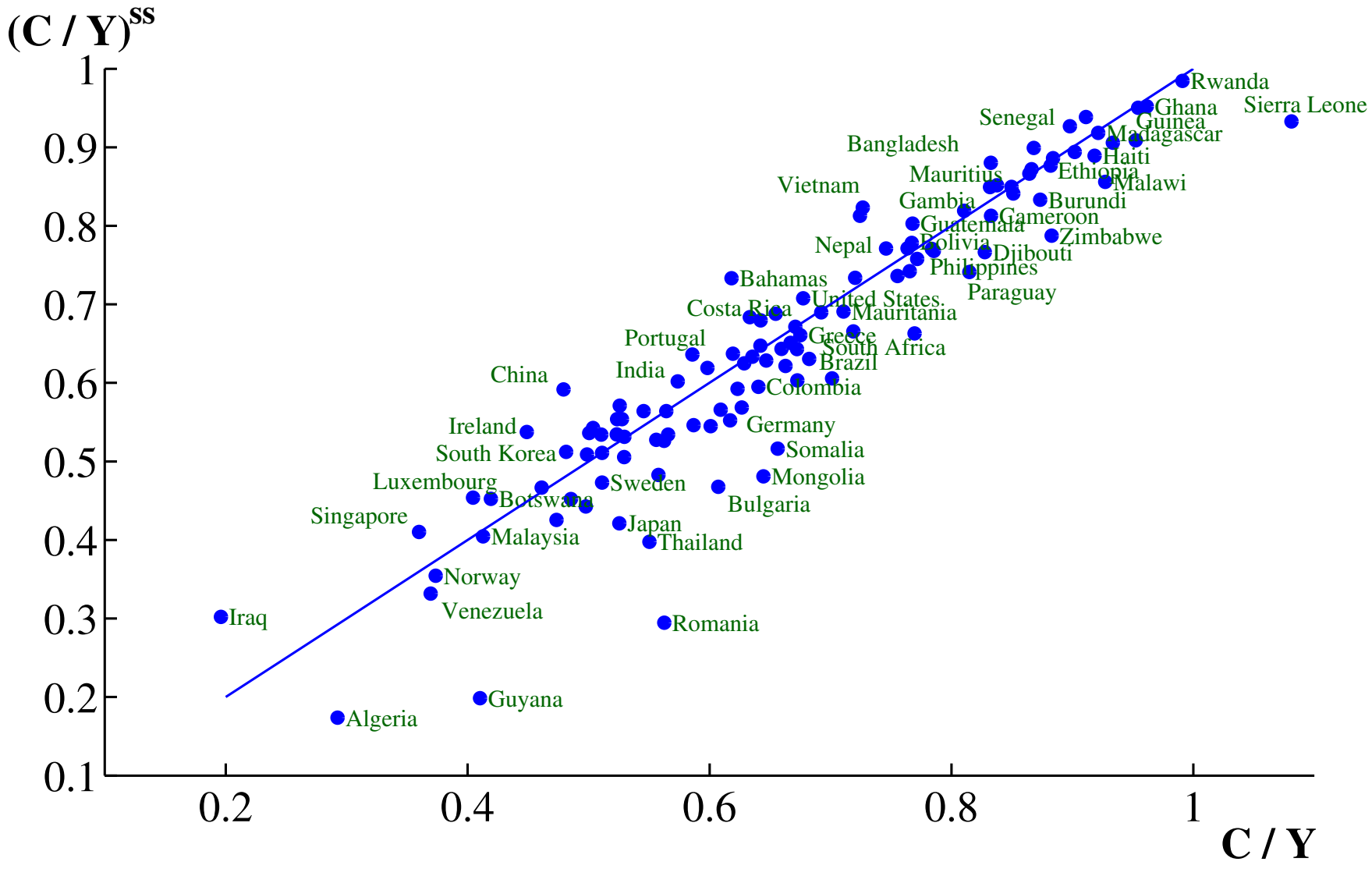
Equivalent Variation, 2000



Compensating Variation, 2000



Adjusting the Consumption Share for Transition Dynamics



Robustness: Inferring C/Y from K/Y, 2000

Rising $I/Y \Rightarrow (C/Y)^{adj} > C/Y$

Country	Per capita Income	Benchmark welfare	Welfare w/ C/Y adj.	Benchmark C/Y	Adjusted C/Y
U.S.	100.0	100.0	100.0	0.762	0.792
Germany	74.0	95.1	84.3	0.722	0.666
France	70.1	94.4	87.1	0.721	0.693
Japan	72.4	88.3	71.1	0.658	0.554
U.K.	69.8	85.9	83.2	0.789	0.795
Hong Kong	82.1	78.1	75.1	0.714	0.715
Singapore	82.9	39.1	42.1	0.426	0.477
S Korea	47.1	29.2	29.6	0.580	0.611
China	11.3	5.7	6.3	0.698	0.810
India	6.6	3.6	3.6	0.883	0.911

Micro Calculations

Micro Calculations

Household Surveys for various country-years

- Household expenditures
- Age, Hours Worked of each household member

Have analyzed micro data for:

- U.S. (1984–2006)
- France (1984–2005)
- India (1984-2005)
- Mexico (1984-2002)
- South Africa (1993)

10 Advantages to Micro Calculations

- Make sure consumption (not income) inequality
- Allow arbitrary (non-normal) distribution of consumption
- Drop durables (lumpy)
- Individual (rather than household) consumption
- Better measure of hours worked if non-OECD
- Incorporate inequality in leisure
- Adjust for age composition of population
- Incorporate survival rates by age
- Uniform use of sampling weights
- Allow government consumption to lower inequality (if desired)

Theory for the Micro Calculation

- Basic notation:

  $a \equiv$ age

  $j \equiv$ people within age group

  $S_a^i \equiv$ Probability of surviving to age a in country i

- Mortality notation

$$s_a^{us} \equiv \frac{S_a^{us}}{\sum_a S_a^{us}}$$

$$\Delta s_a^i \equiv \frac{S_a^i - S_a^{us}}{\sum_a S_a^{us}}$$

- Demographically-adjusted averages:

$$\bar{c}^i \equiv \sum_a s_a^{us} \sum_j \bar{\omega}_{ja}^i c_{ja}^i$$

$$\bar{\ell}^i \equiv \sum_a s_a^{us} \sum_j \bar{\omega}_{ja}^i \ell_{ja}^i$$

Micro Welfare Decomposition

$$
\begin{aligned}
\log \lambda_i \;=\; & \sum\nolimits_a \Delta s_a^i u_a^i && \text{Life Exp.} \\
& + \log \bar{c}_i - \log \bar{c}_{us} && \text{Consumption} \\
& + v(\bar{\ell}_i) - v(\bar{\ell}_{us}) && \text{Leisure} \\
& + E \log c_i - \log \bar{c}_i - \left(E \log c_{us} - \log \bar{c}_{us}\right) && \text{Cons. Ineq.} \\
& + Ev(\ell_i) - v(\bar{\ell}_i) - \left(Ev(\ell_{us}) - v(\bar{\ell}_{us})\right) && \text{Leis. Ineq.}
\end{aligned}
$$

Micro Calculations: Levels

	Welfare λ	Income	Log Ratio	Life Exp.	C/Y	Leis.	Cons Ineq	Leis Ineq
				Decomposition				
France	103.1	68.7	.405	.132	-.090	.118	.110	.135
(macro)	94.4	70.1	.298	.119	-.055	.139	.095	...
India	4.9	8.0	-.487	-.614	.102	.002	.050	-.027
(macro)	3.6	6.6	-.610	-.826	.148	.047	.021	...
Mexico	21.3	25.7	-.188	-.161	.065	.009	-.099	-.002
(macro)	15.6	25.9	-.508	-.171	-.018	-.049	-.269	...
S Africa	10.8	22.6	-.744	-.609	.217	.084	-.427	-.008
(macro)	4.3	21.6	-1.609	-1.382	.122	.096	-.445	...

Micro Calculations: Growth Rates

	Welfare Growth	Income Growth	Diff	Decomposition: Life Exp.	C/Y	Leis.	Cons. Ineq.	Leis. Ineq
France	2.28	1.64	0.64	.92	-.16	-.02	-.13	.03
(macro)	3.46	1.61	1.85	1.44	-.09	.36	.13	...
India	3.69	3.68	.01	.52	-.38	.02	-.17	.01
(macro)	4.07	2.89	1.18	1.28	.12	.10	-.32	...
Mexico	1.50	1.04	.46	.72	.01	-.21	.12	-.18
(macro)	1.73	0.53	1.20	1.77	-.01	-.39	-.17	...
U.S.	2.39	1.94	.45	.70	.00	-.33	-.01	.09
(macro)	2.70	2.04	.66	1.09	-.11	-.16	-.16	...

Conclusions

- Income and welfare are highly correlated in both levels and growth rates.
- Nevertheless, differences between income and welfare are often economically important:
  - Western Europe looks much closer to U.S. living standards.
  - Most other countries are further behind, primarily due to lower life expectancy.
  - Longer lives add over one percentage point, on average, to welfare growth per year 1980–2000.