Subjective Well-Being, Income, Economic Development and Growth

Dan Sacks, Betsey Stevenson and Justin Wolfers

Wharton School, University of Pennsylvania and NBER

CSLS-ICP Conference on Happiness – December 1, 2010

Implications of the Easterlin Paradox

- *"Why do national comparisons among countries and over time show an association between income and happiness which is so much weaker than, if not inconsistent with, that shown by within-country comparisons?"* –Easterlin (1974)
  - Reference-dependent preferences
    - Relative income matters [Other people's consumption matters]
    - Habit formation = hedonic treadmill [Other period's consumption]
- Policy implications:
  - Growth: *"My results, along with mounting evidence from other time series studies of subjective well-being, do on balance undermine the view that a focus on economic growth is in the best interests of society."* –Easterlin (2005)
  - Public finance: If preferences are interdependent

    $\Rightarrow$ Pigouvian rationale for taxing labor supply / conspicuous consumption

Subjective Well-being

- "Subjective well-being refers to all of the various types of evaluations, both positive and negative, that people make of their lives. It includes reflective cognitive evaluations, such as life satisfaction and work satisfaction, interest and engagement, and affective reactions to life events, such as joy and sadness." (Diener, 2005)
- Typical questions:
  - Happiness
    - "Taking all things together, would you say you are: very happy; quite happy; not very happy; not at all happy."
  - Life satisfaction
    - "All things considered, how satisfied are you with your life as a whole these days?" [1=Dissatisfied – 10=Satisfied]
  - Satisfaction ladder:
    - "Here is a ladder representing the 'ladder of life'. Let's suppose the top of the ladder represents the best possible life for you, and the bottom, the worse possible life for you. On which step of the ladder do you feel you personally stand at the present time? [0-10 steps]."

Research Question: What is the Relationship Between Subjective Well-being and Income?

Types of comparisons	1970s view "Easterlin Paradox"
Within country: Rich v. poor people in a country	Big effects
Between country: Rich v. poor countries	Statistically insignificant effects interpreted to be zero
National time series: Country when rich v. poor	No effects (Japan, USA, Europe)
International panel: Countries with fast v. slow growth	Largely unexamined
Implications	**Relative income determines well-being**
Policy conclusions	**De-emphasize growth**

"My results, along with mounting evidence from other time series studies of subjective well-being, do on balance undermine the view that a focus on economic growth is in the best interests of society."
– Richard Easterlin (2005)

Research Question: What is the Relationship Between Subjective Well-being and Income?

Types of comparisons	1970s view "Easterlin Paradox"	1990s view "Satiation"
Within country: Rich v. poor people in a country	Big effects	Big effects for income <$15k - But not for the rich
Between country: Rich v. poor countries	Statistically insignificant effects interpreted to be zero	GDP<$15k: Strong effects GDP>$15k: No effects
National time series: Country when rich v. poor	No effects (Japan, USA, Europe)	No effects (Available data are for rich countries)
International panel: Countries with fast v. slow growth	Largely unexamined	Largely unexamined
Implications	**Relative income determines well-being**	**Relative income determines well-being… once "basic needs" are met"**
Policy conclusions	**De-emphasize growth**	**Rich countries should de-emphasize growth and tax labor supply**

"once a country has over $15,000 per head, its level of happiness appears to be independent of its income"
– Richard Layard (2003)

Research Question: What is the Relationship Between Subjective Well-being and Income?

Types of comparisons	1970s view "Easterlin Paradox"	1990s view "Satiation"	New view:
Within country: Rich v. poor people in a country	Big effects	Big effects for income <$15k - But not for the rich	Strong effects: $\beta^{within} \approx 0.35$
Between country: Rich v. poor countries	Statistically insignificant effects interpreted to be zero	GDP<$15k: Strong effects GDP>$15k: No effects	Strong effects $\beta^{between} \approx 0.35$
National time series: Country when rich v. poor	No effects (Japan, USA, Europe)	No effects (Available data are for rich countries)	Strong effects $\beta^{time\ series} \approx 0.35$
International panel: Countries with fast v. slow growth	Largely unexamined	Largely unexamined	Strong effects $\beta^{panel} \approx 0.35$
Implications	**Relative income determines well-being**	**Relative income determines well-being… once "basic needs" are met"**	**There's no paradox (and never was)**
Policy conclusions	**De-emphasize growth**	**Rich countries should de-emphasize growth and tax labor supply**	

Why revisit the stylized facts?

1. Theoretical implications: Reference-dependent preferences
2. Yielding important policy implications (and big policy claims)

What explains our new findings?

1. New data:
   - Longer time series (1946-2010);
   - More countries (n=140)
2. Statistical inference: Absence of evidence v. evidence of absence
3. What are "big" versus small effects? ⇒ Focus on the magnitudes

What we won't do

- Assess causality: *Happiness = β log(Income)*
- Revisit what subjective well-being data "mean"

Outline: Assessing the Happiness-Income link

- Within-country cross-sectional comparisons
  - USA
  - All countries

- Between countries:
  - In past and current data
  - Multiple datasets
  - For both happiness and life satisfaction
  - No evidence of satiation

- National Time Series and International Panels
  - Japan
  - Europe
  - World Values Survey
  - USA

- Newly-available measures of subjective well-being

Within-Country Comparisons: USA

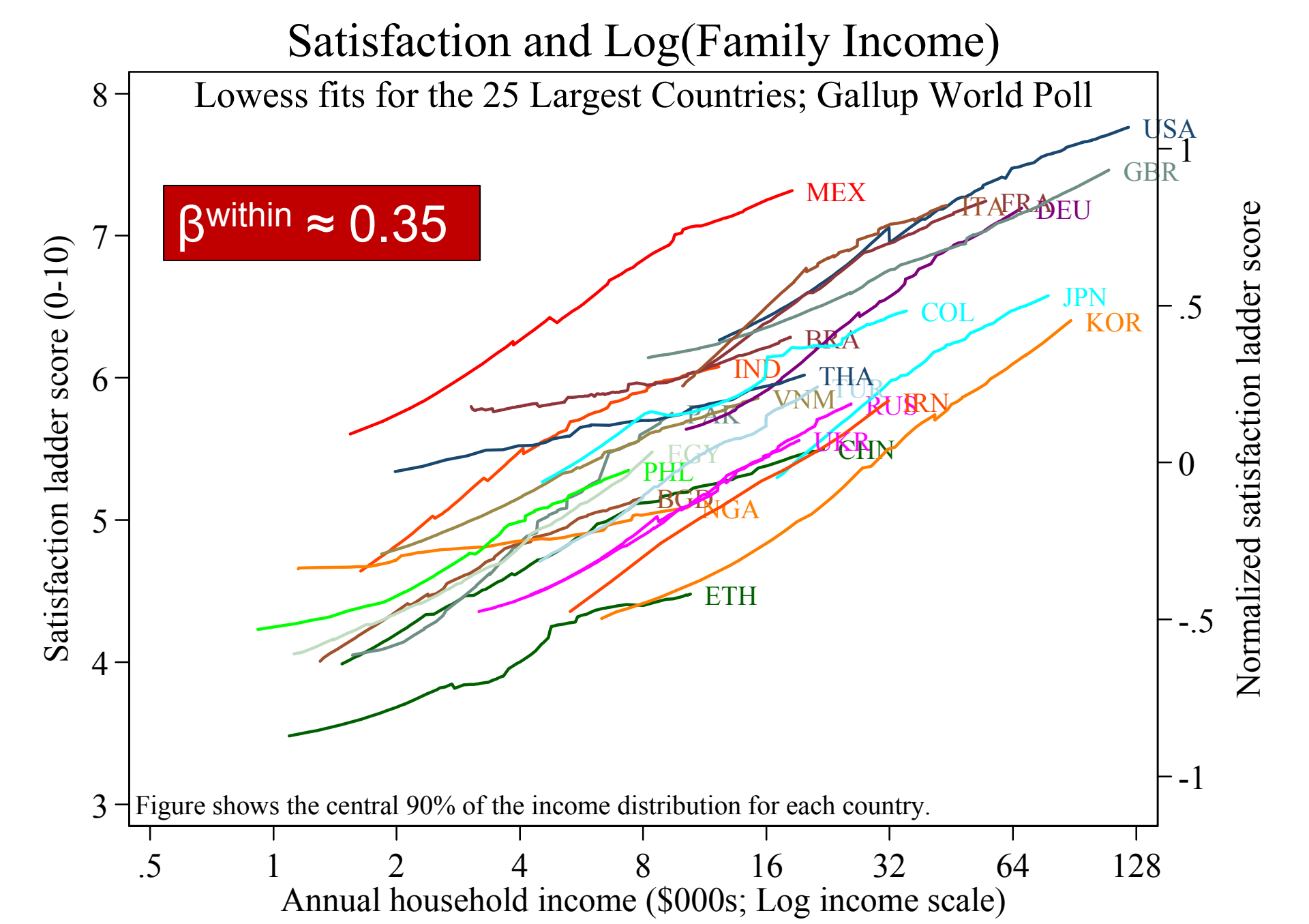
"Taken all together, how would you say things are these days?"

Family income	Very happy	Pretty happy	Not too happy
<$12,500 (bottom 10%)	21%	53%	26%
$12,500-$49,999	25%	61%	13%
$50,000-$149,999	40%	54%	6%
≥$150,000 (top 10%)	53%	45%	2%

Source: U.S. General Social Survey, 2006

"When we plot average happiness versus income for clusters of people in a given country at a given time, we see that rich people are in fact much happier than poor people. It's actually an astonishingly large difference. There's no one single change you can imagine that would make your life improve on the happiness scale as much as to move from the bottom 5 percent on the income scale to the top 5 percent."

- Robert Frank (2005)



Source: Daniel Sacks, Betsey Stevenson and Justin Wolfers (2010), "Subjective Well-Being, Income,

Within-country : Rich are happier than poor

$$Standardized\ satisfaction_{ic} = \sum_{countries} \alpha_c + \beta^{individual} ln(Income_{ic}) + X_{ic}\delta + \varepsilon_{ic}$$

	Without controls	*With controls*	*Permanent Income Adjusted*	*IV*	*Sample size*
Gallup World Poll: Ladder question	0.236*** (0.014)	0.232*** (0.014)	0.422	0.449 *** (0.027)	171,900 (126 Countries)
World Values Survey: Life satisfaction	0.216*** (0.017)	0.227*** (0.037)	0.413	0.26*** (0.035)	116,527 (61 Countries)
Pew Global Attitudes Survey: Ladder question	0.281*** (0.027)	0.283*** (0.027)	0.515	0.393*** (0.033)	32,463 (43 Countries)

Notes: The table reports the coefficient on the log of household income, obtained from regressing standardized life satisfaction against the log of household income and country fixed effects using the indicated data set. Additional controls include a quartic in age, interacted with sex, plus indicators for age and sex missing. Our permanent income adjustment is to scale up our estimates by 1/0.55; see text for explanation. We instrument for income using full set of country×education fixed effects. We report robust standard errors, clustered at the country level, in parentheses. For further details on the standardization of satisfaction and the exact wording of satisfaction question, see the text. ***, ** and * denote statistically significant at 1%, 5% and 10%, respectively.

Outline: Assessing the Happiness-Income link

- Within-country comparisons
  - USA
  - All countries

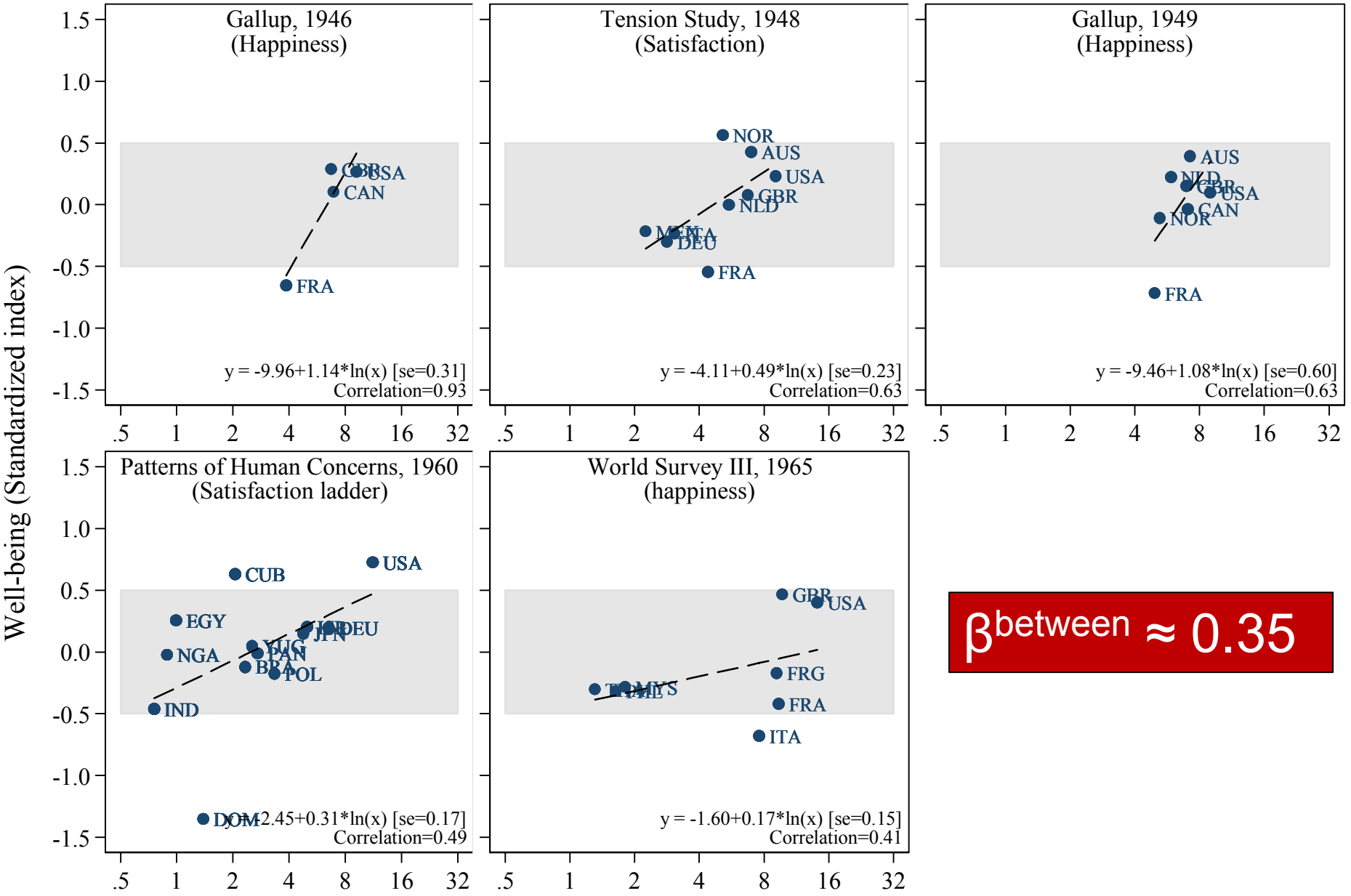
$\beta_{within} \approx 0.35$

- Between countries:
  - In past and current data
  - Multiple datasets
  - Both happiness and life satisfaction
  - No evidence of satiation

> *"the happiness differences between rich and poor countries that one might expect on the basis of the within country differences by economic status are not borne out by the international data."* – Easterlin, (1974)

- National Time Series and International Panels
  - Japan
  - Europe
  - World Values Survey
  - USA

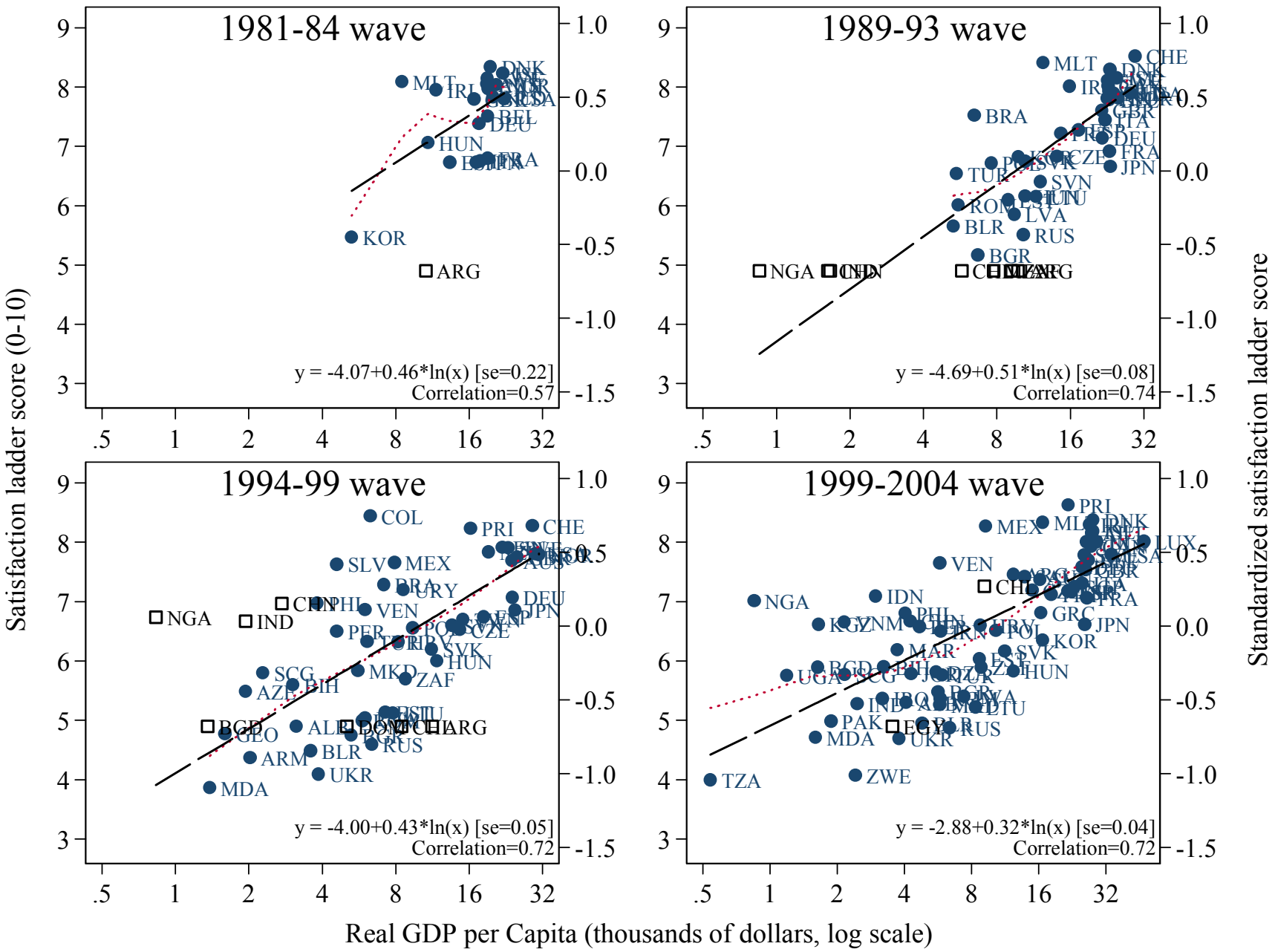
Early Cross-National Studies of Well-Being and GDP

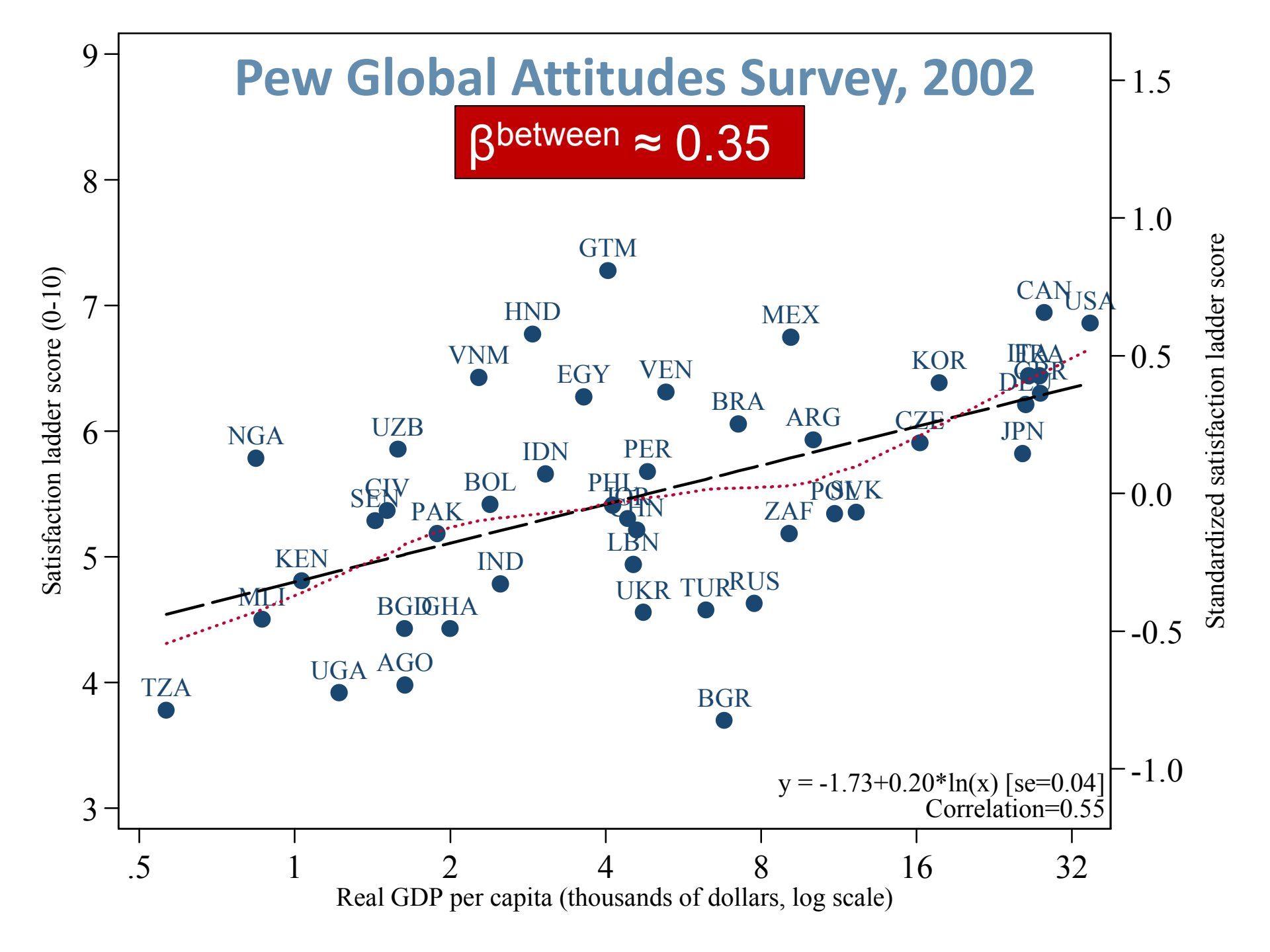


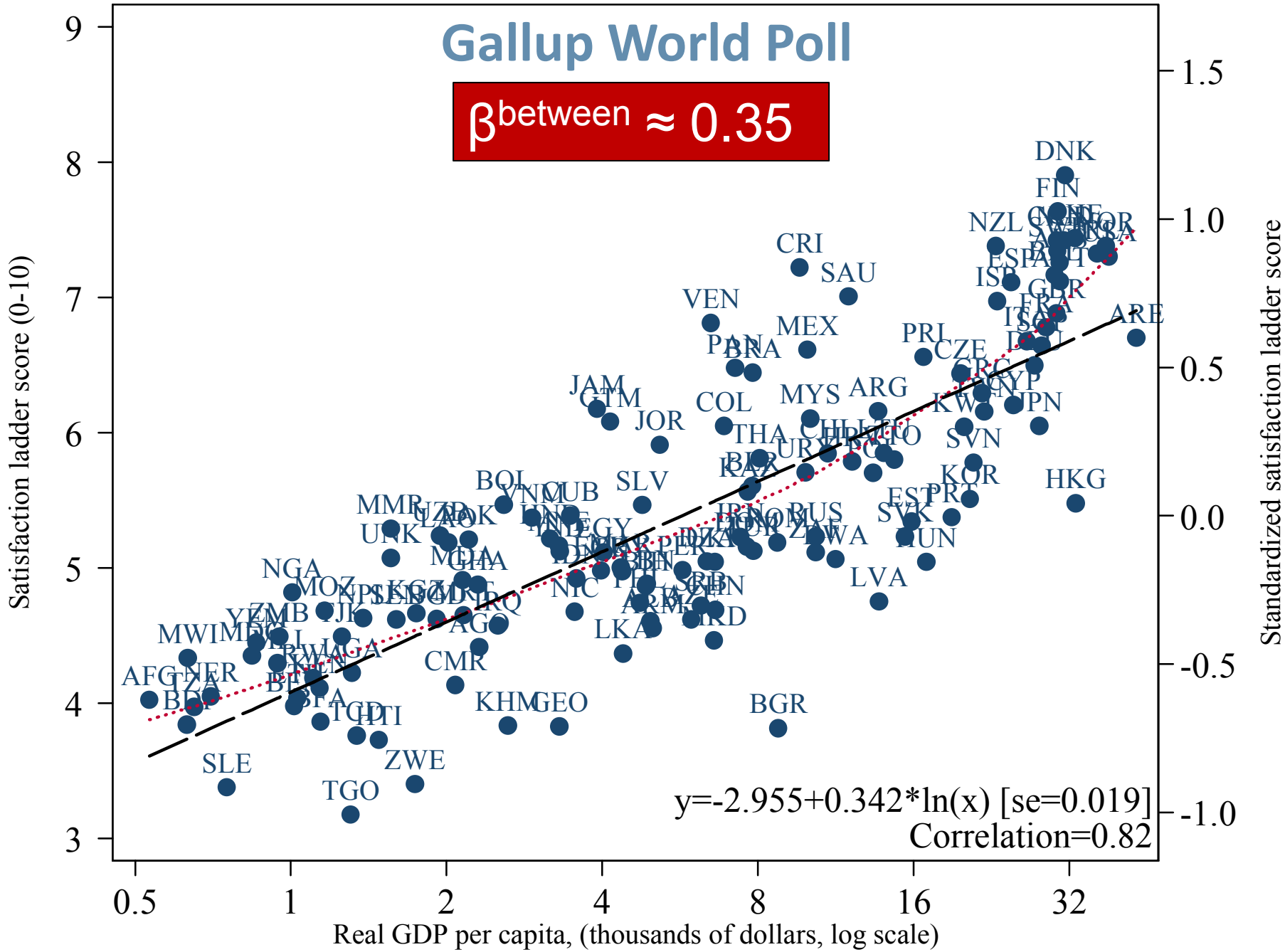
$\beta^{between} \approx 0.35$

World Values Survey

$\beta^{between} \approx 0.35$




Pew Global Attitudes Survey, 2002
β between ≈ 0.35
Satisfaction ladder score (0-10)
Standardized satisfaction ladder score
Real GDP per capita (thousands of dollars, log scale)
y = -1.73+0.20*ln(x) [se=0.04]
Correlation=0.55
9
8
7
6
5
4
3
1.5
1.0
0.5
0.0
-0.5
-1.0
.5
1
2
4
8
16
32
GTM
HND
MEX
CAN
USA
VNM
EGY
VEN
KOR
BRA
ARG
CZE
JPN
NGA
UZB
IDN
PER
BOL
PAK
ZAF
KEN
IND
LBN
UKR
TUR
RUS
MLI
GHA
AGO
UGA
TZA
BGR



Gallup World Poll
$\beta^{between} \approx 0.35$
y=-2.955+0.342*ln(x) [se=0.019]
Correlation=0.82
Satisfaction ladder score (0-10)
Standardized satisfaction ladder score
Real GDP per capita, (thousands of dollars, log scale)

Between Countries: Rich Countries Are Happier

$$Standardized\ satisfaction_{ic} = \alpha + \beta^{between} \ln(GDP\ per\ capita_c) + X_{ic}\delta + \varepsilon_{ic}$$

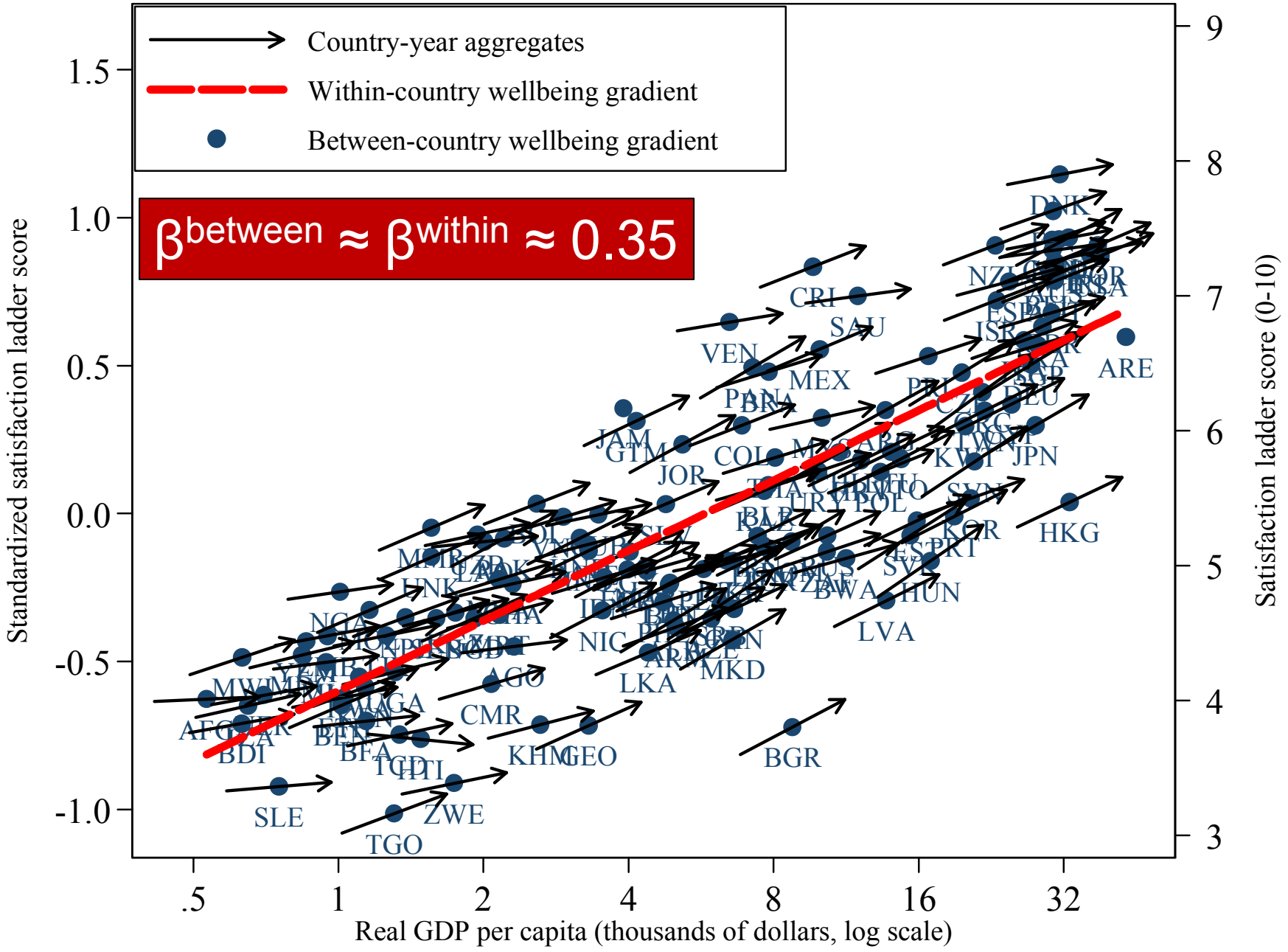
Estimates of $\beta^{between}$

$\beta^{between} \approx 0.35$

	Microdata		*National Data*	
	Without controls	*With controls*		*Sample size*
Gallup World Poll: Ladder question	0.357^{***} (0.019)	0.378^{***} (0.019)	0.342^{***} (0.019)	291,383 (131 countries)
World Values Survey: Life satisfaction	0.360^{***} (0.034)	0.364^{***} (0.034)	0.370^{***} (0.036)	234,093 (79 countries)
Pew Global Attitudes Survey: Ladder question	0.214^{***} (0.039)	0.231^{***} (0.038)	0.204^{***} (0.037)	37,974 (44 countries)

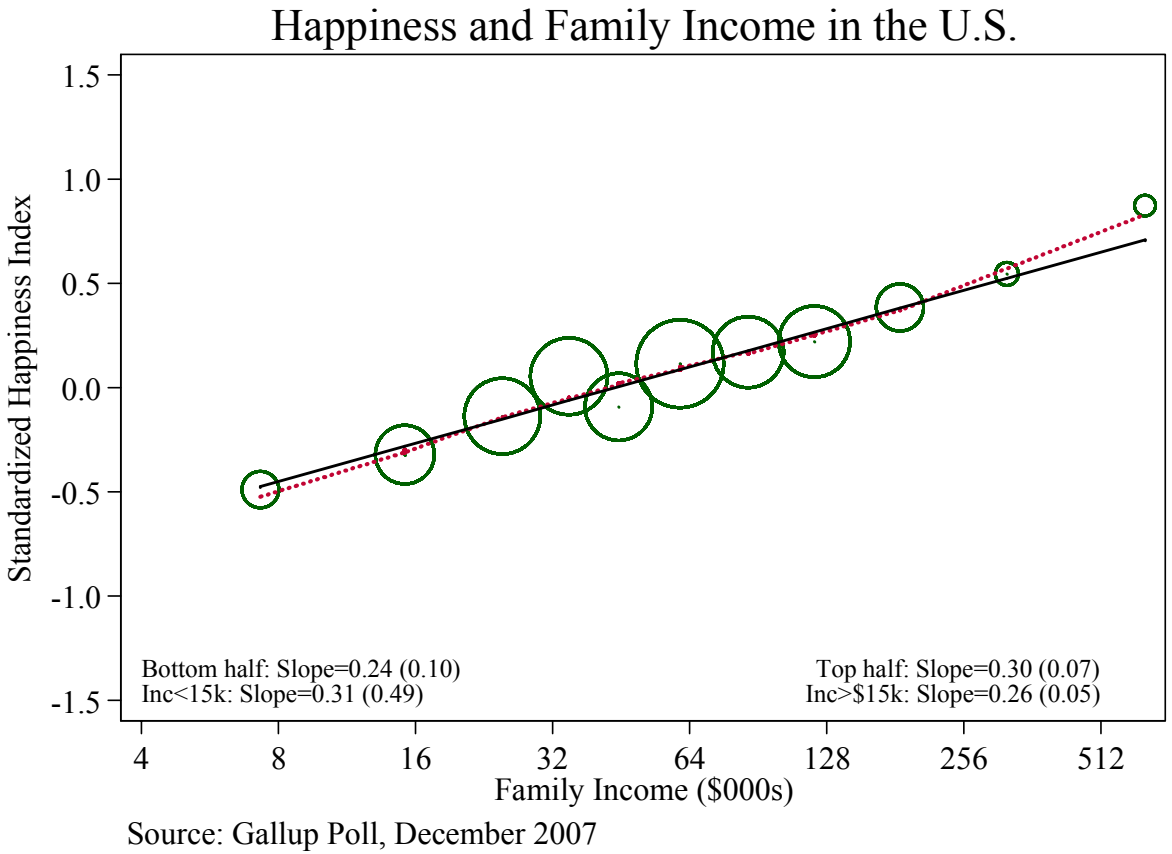
Notes: This table reports the coefficient on the log of per capita GDP, obtained from regressing standardized life satisfaction against the log of GDP, using individual data with and without controls, and using national-level data without controls, in the indicated data set. In the national-level regressions, we take the within-country average of standardized life satisfaction as the dependent variable. GDP per capita is at purchasing power parity. The additional controls include a quartic in age, interacted with sex, plus indicators for age and sex missing. We report robust standard errors, clustered at the country level, in parentheses. For further details on the standardization of satisfaction, the exact wording of satisfaction question, and the sources for GDP per capita, see the text. ***, ** and * denote statistically significant at 1%, 5% and 10%, respectively.

Comparing Within and Between Country Estimates



Are There Satiation Effects?

- There exists no dataset in which the well-being-income gradient changes at incomes above $15,000
- There exists no income level above which further income does not raise happiness



Source: Betsey Stevenson and Justin Wolfers (2010), "Subjective Well-being and Income: Is There Any Evidence of Satiation?"

Outline: Assessing the Happiness-Income link

- Within-country comparisons
  - USA
  - All countries

$\beta_{within} \approx 0.35$

- Between countries:
  - Through time
  - Multiple datasets
  - Both happiness and life satisfaction
  - No evidence of satiation

$\beta_{between} \approx 0.35$

- National Time Series and International Panels
  - Japan
  - Europe
  - World Values Survey
  - USA

"income growth in a society does not increase happiness". - Easterlin (1995)

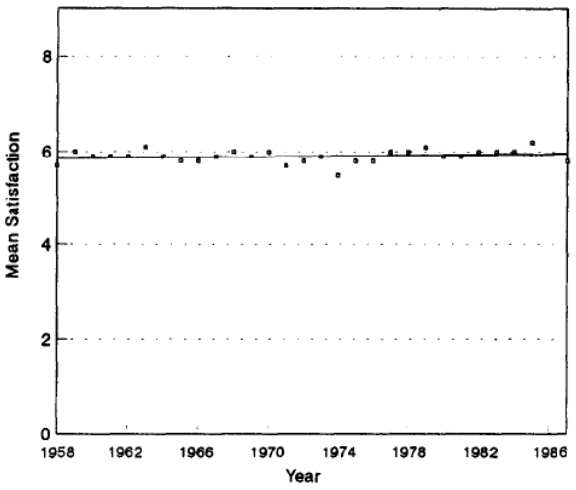
Happiness & Economic Growth: Time Series Evidence

- Japan
  - Old view: Life satisfaction flat, despite robust post-war growth
  - New view: Robust growth in life satisfaction
    …apparent only when taking account of breaks in the data
- US
  - Old view: No increase in happiness since 1972 despite GDP growth
  - New view: True.
    …but few sample participants experienced income growth
- Europe
  - Old view: No clear evidence of growing life satisfaction (1973-89)
  - New view: Extending data through 2007 yields clearly rising satisfaction
- Around the World
  - Old view: No clear evidence of growing life satisfaction
  - New view: Clear positive relationship between income and growth
    … when comparing comparable samples

Source: Betsey Stevenson and Justin Wolfers (2010), "Time Series Evidence on the Well-Being Link"

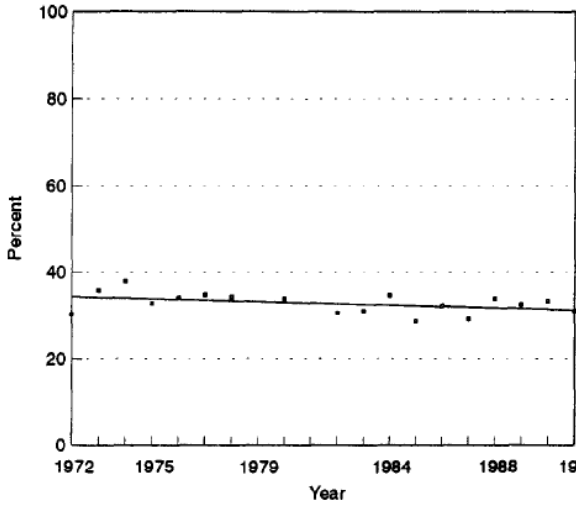
Time Series: No rise in happiness, despite growth

Japan	U.S.A	Europe
Life in Nation Surveys	General Social Survey	Eurobarometer



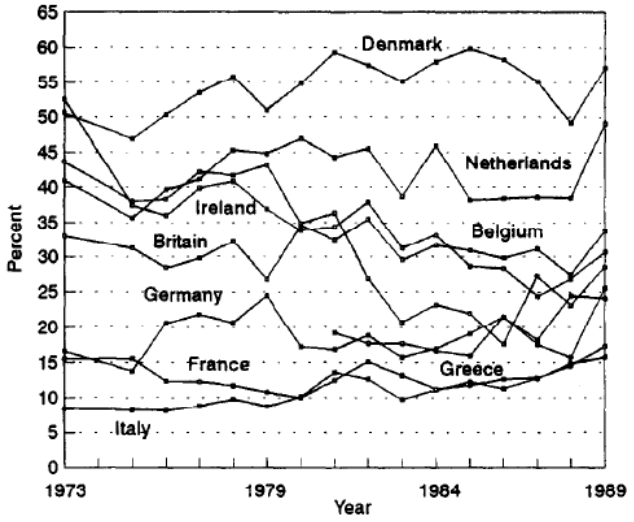
Source and notes: Veenhoven, 1993. An ordinary least squares regression is fitted to the data; the coefficient of mean satisfaction on year is not statistically significant.

Fig. 3. Mean subjective well-being, Japan 1958–1987.



Source and notes: National Opinion Research Center, 1991. Th question is, "Taken all together, how would you say things are these days -- would you say that you are very happy, pretty hap or not too happy?" An ordinary least squares regression line is fi to the data; the time trend is not statistically significant.

Fig. 1. Percent very happy, United States, 1972–1991.

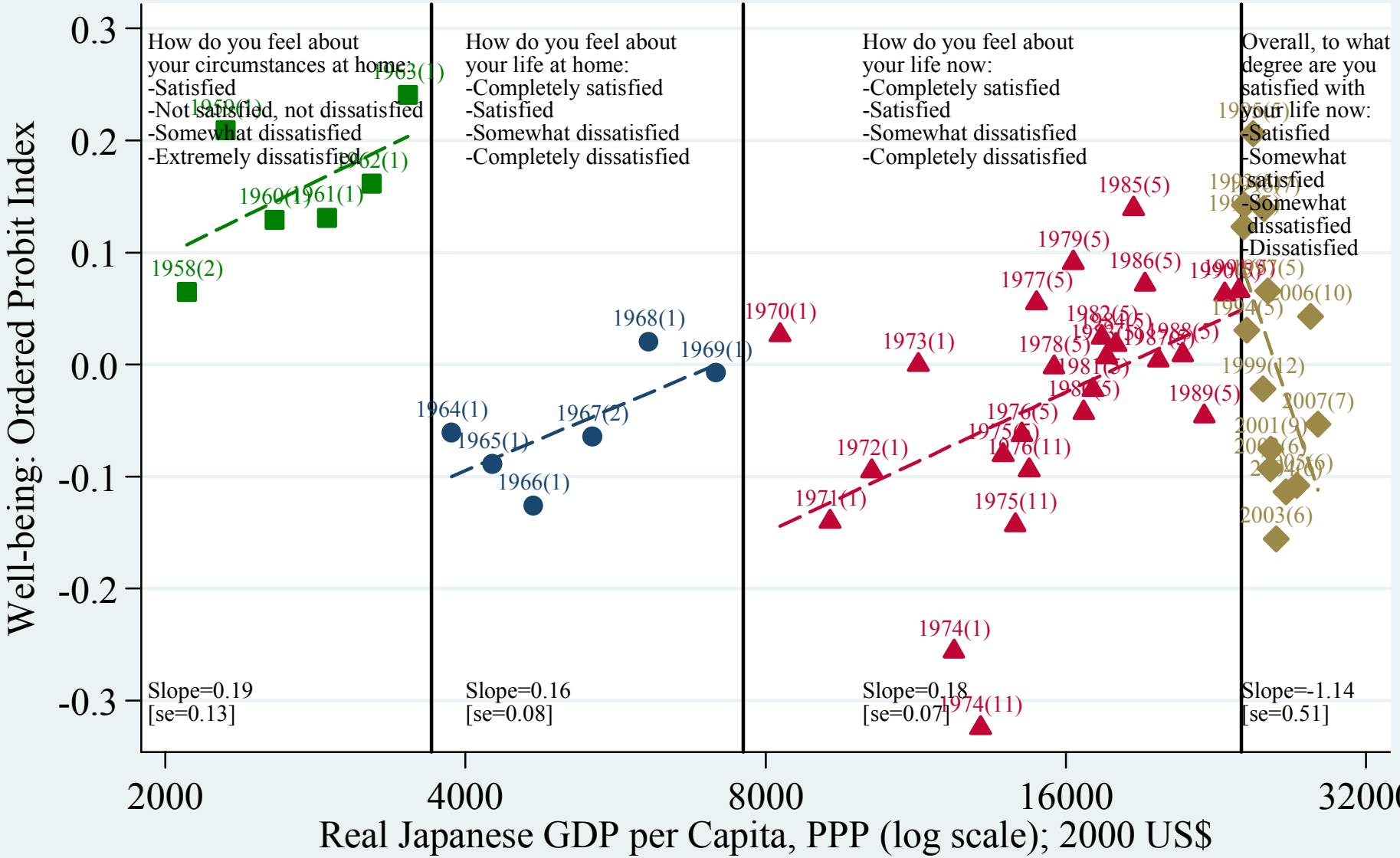


Source and notes: Inglehart et al. 1992. The question asked is, "Generally speaking, how satisfied are you with your life as a whole? Would you say that you are very satisfied, fairly satisfied, not very satisfied, or not at all satisfied?" Ordinary least squares regressions (not shown) yielded time trends that were not significant for five countries, significant and positive for two, and significant and negative for two.

Fig. 2. Percent very satisfied with their lives in general, nine European countries, 1973–1989.

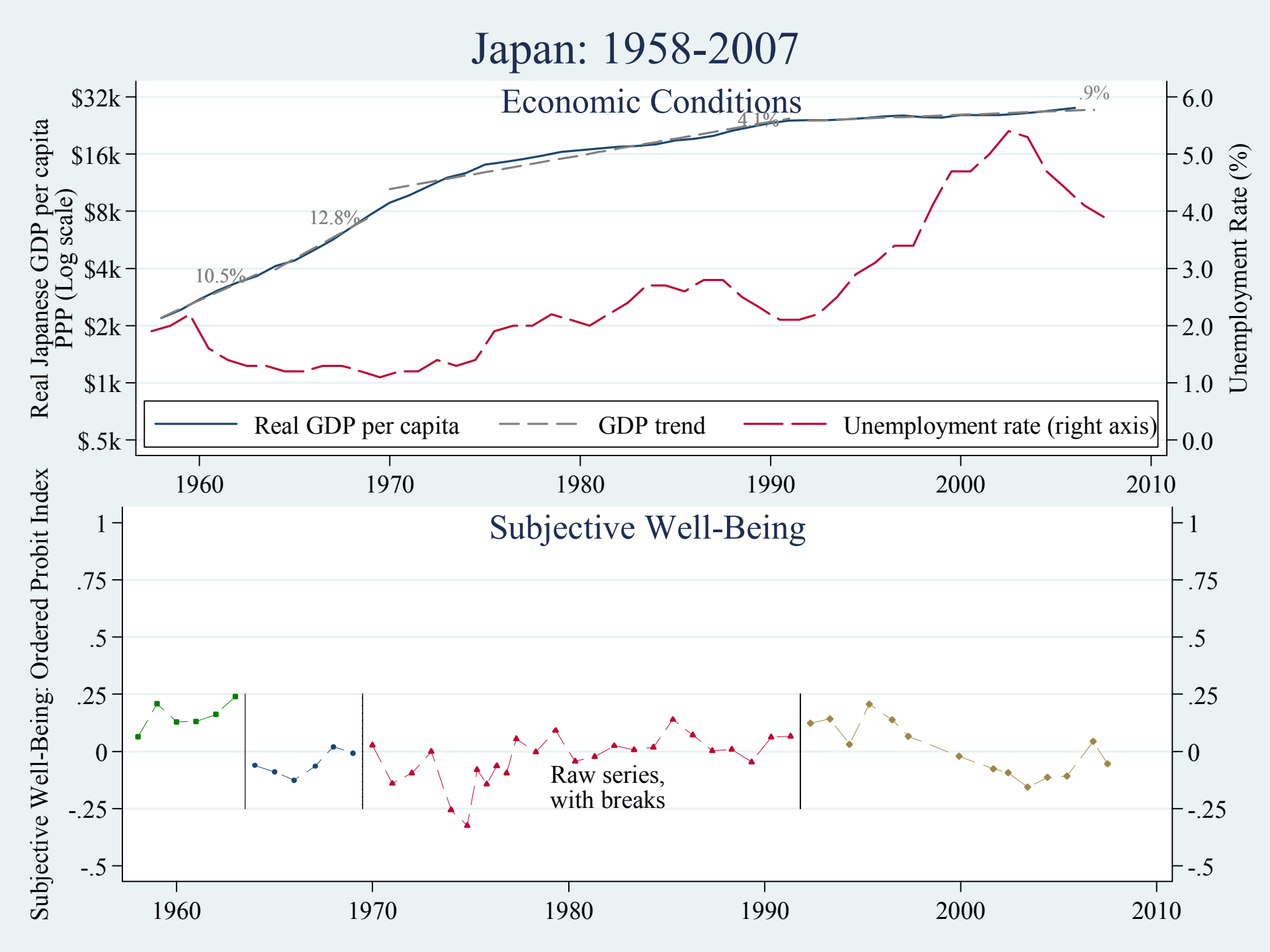
Evolution of Subjective Well-Being and GDP in Japan

Pattern of responses from four different questions

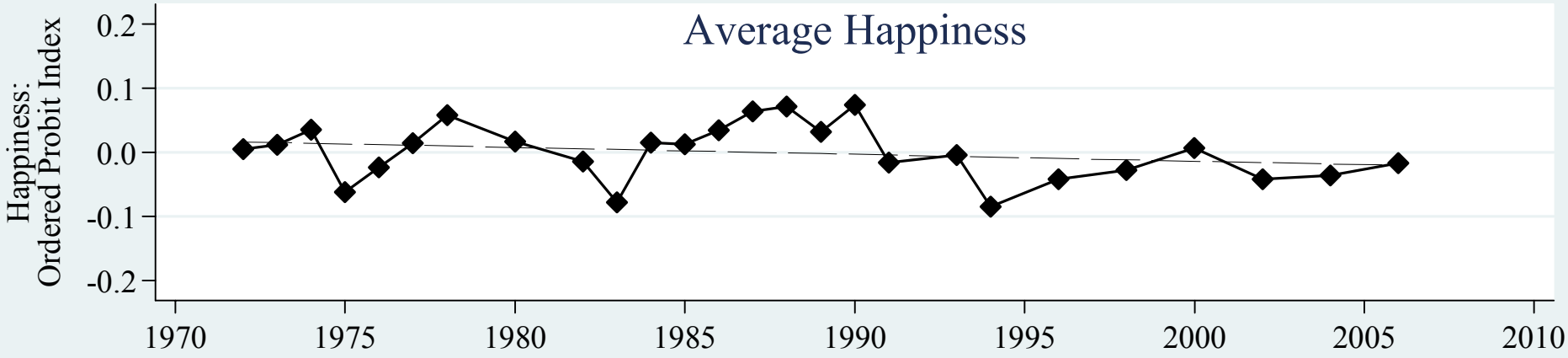


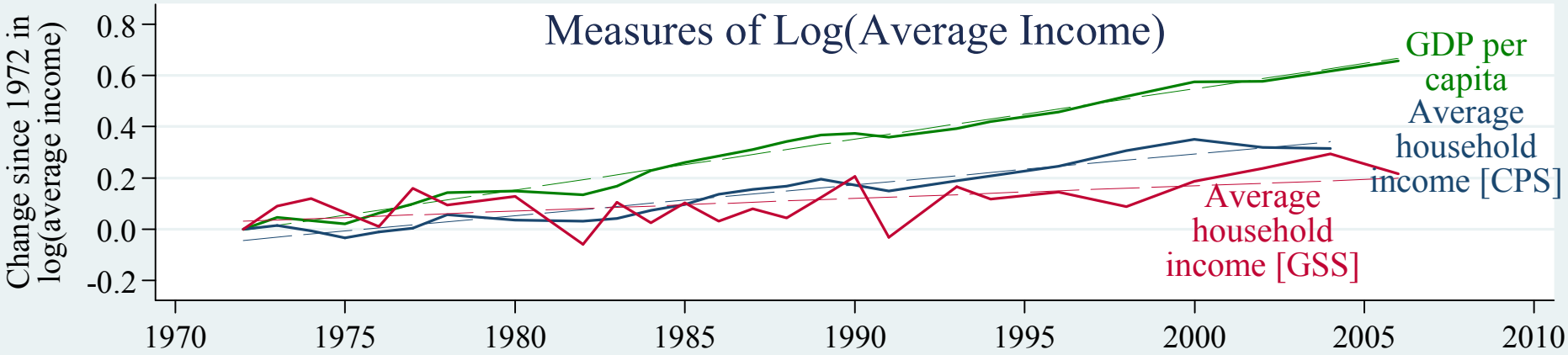
on surveys, 1958-2007.

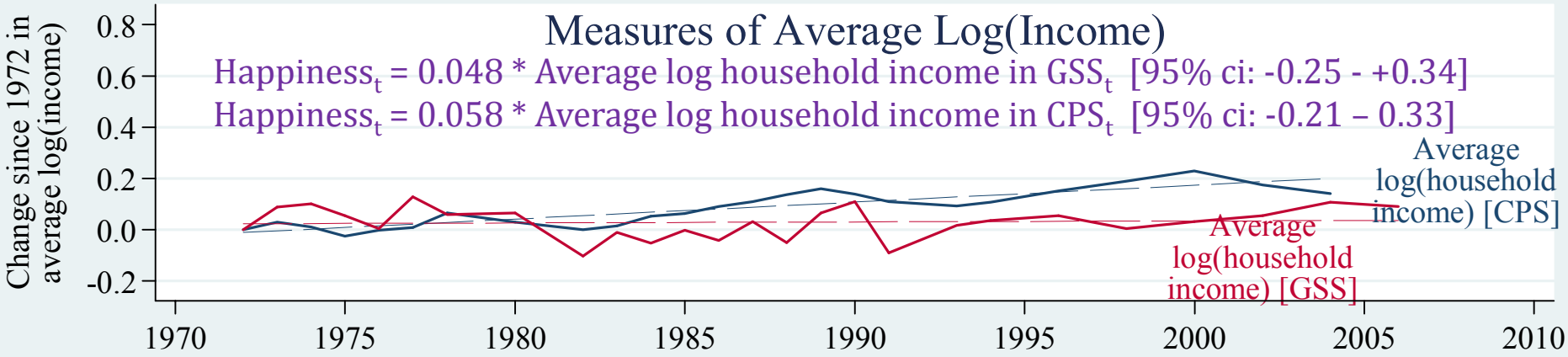
$\beta^{\text{time series}} \approx 0.35$


Japan: 1958-2007
Economic Conditions
Real Japanese GDP per capita
PPP (Log scale)
$32k
$16k
$8k
$4k
$2k
$1k
$.5k
10.5%
12.8%
4.1%
.9%
Real GDP per capita
GDP trend
Unemployment rate (right axis)
Unemployment Rate (%)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1960
1970
1980
1990
2000
2010
Subjective Well-Being
Subjective Well-Being: Ordered Probit Index
1
.75
.5
.25
0
-.25
-.5
Raw series,
with breaks

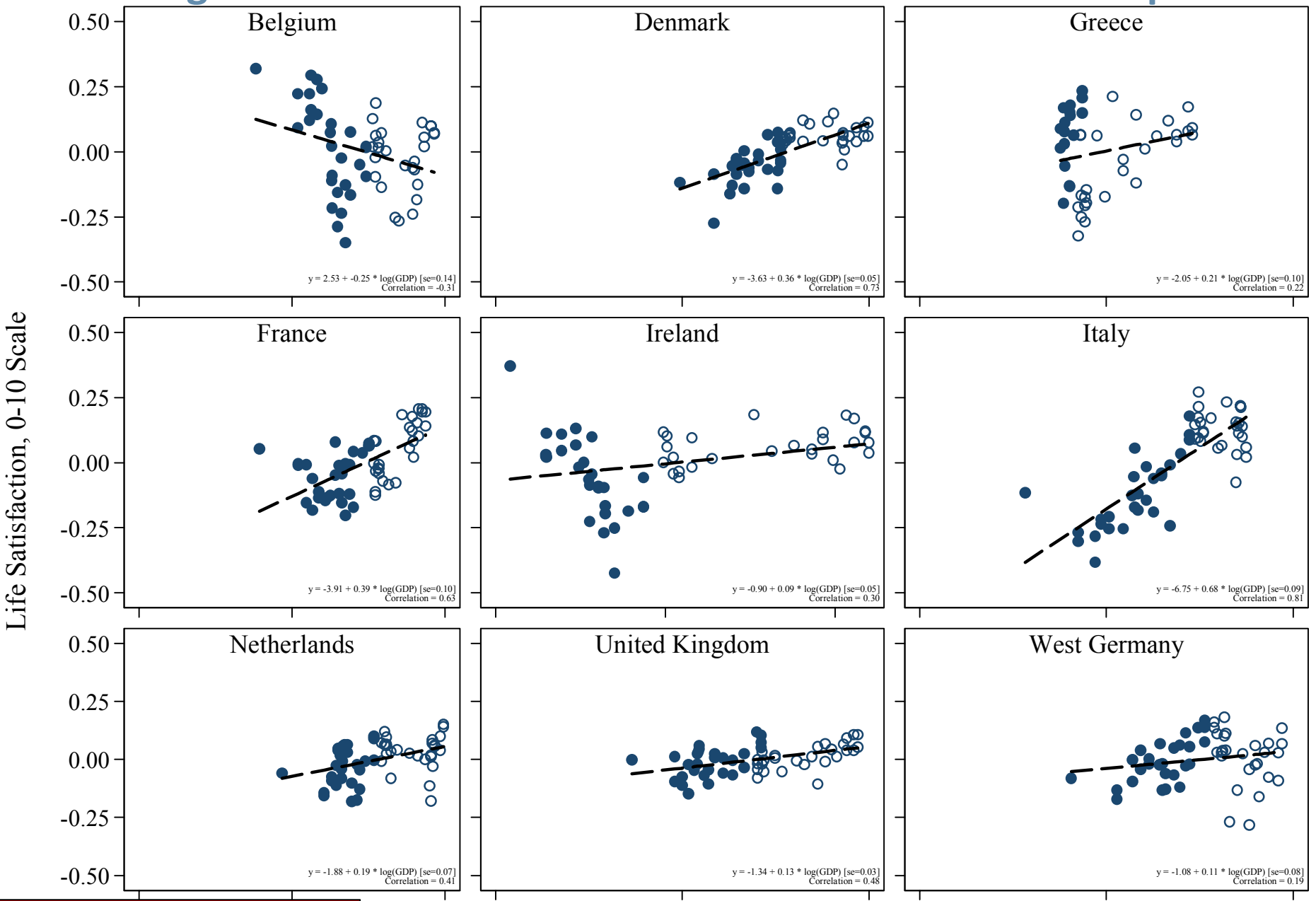
Income and Happiness Trends in the U.S.





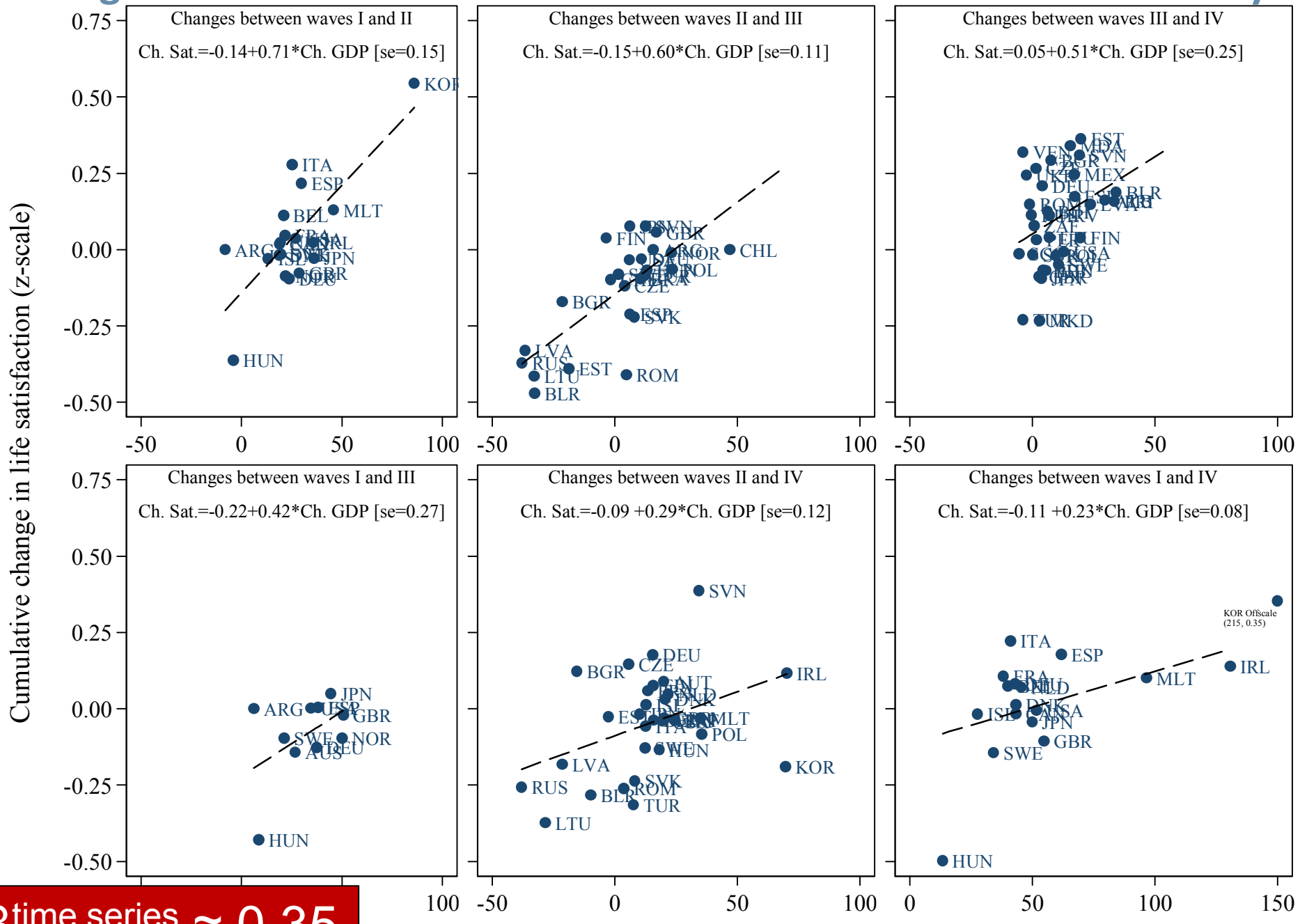


Change in Life Satisfaction and Economic Growth in Europe



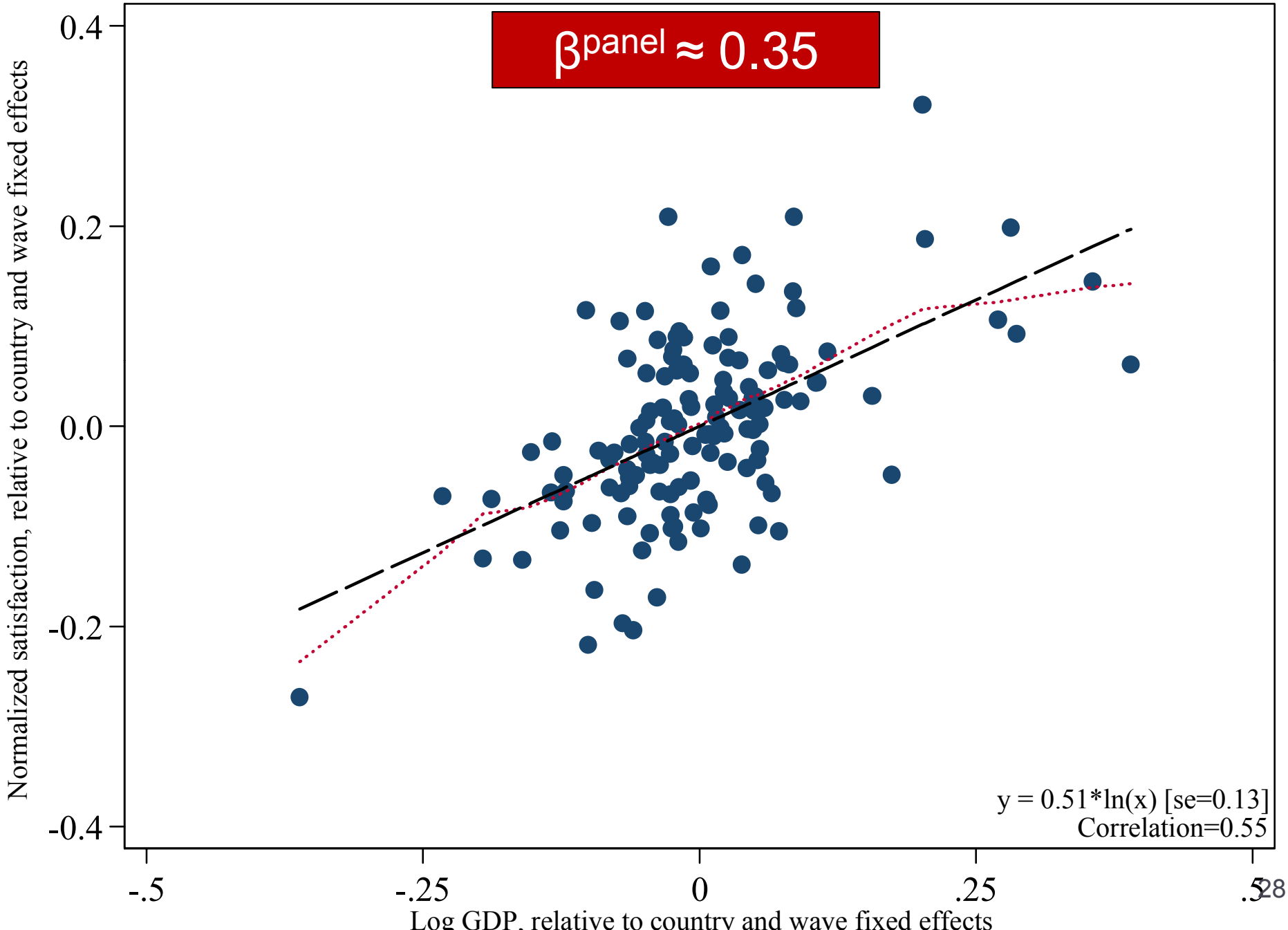
$\beta^{\text{time series}} \approx 0.35$

Change in Life Satisfaction & Economic Growth: World Values Survey



$\beta^{\text{time series}} \approx 0.35$

International Panel Data: World Values Survey

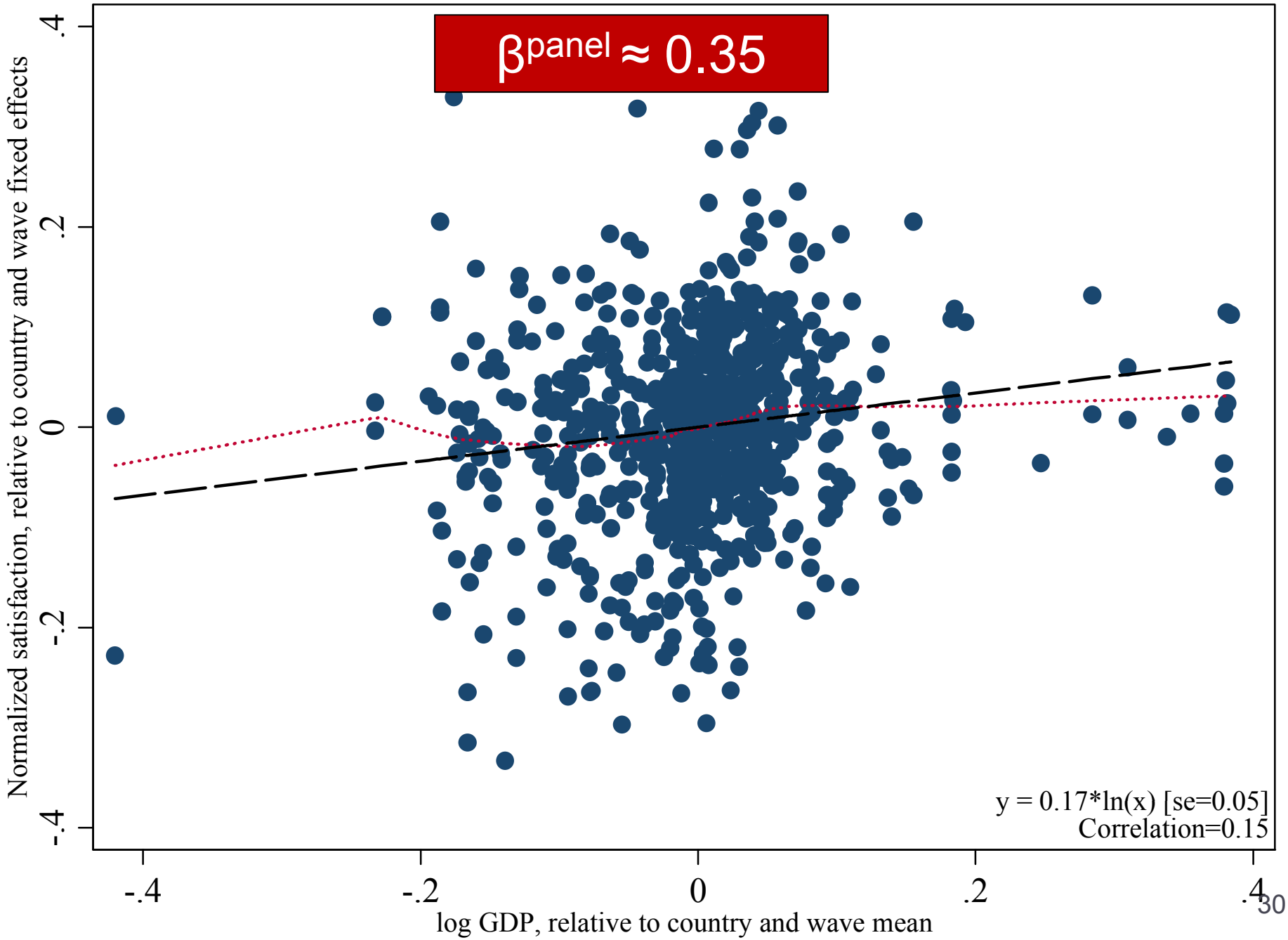


Satisfaction and Growth: International Panel Regressions

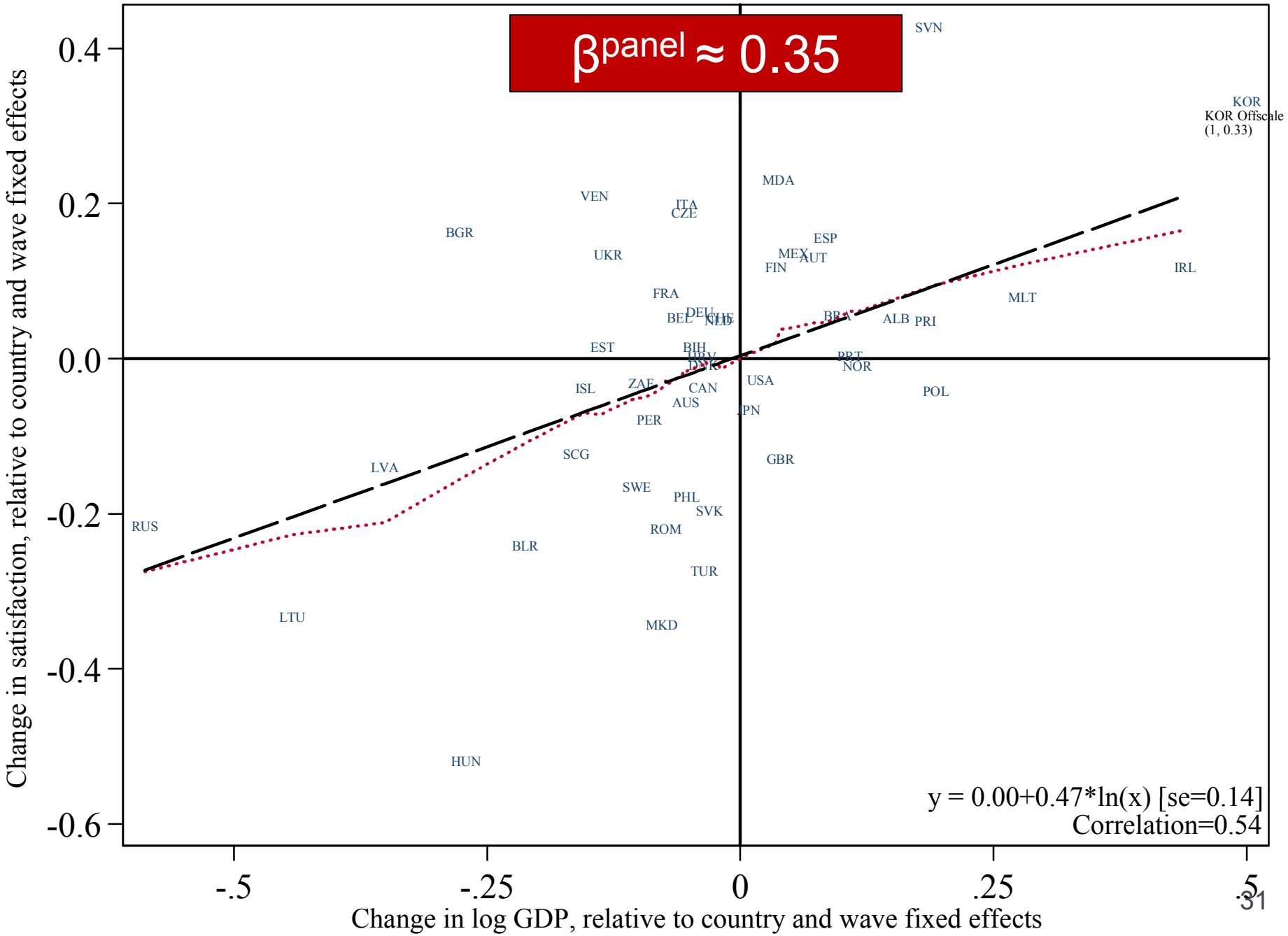
	World Values Survey			Eurobarometer
	All Countries	*Transition Countries*	*Non-transition Countries*	*All Countries*
Panel A: Panel Regressions				
$Life\ Satisfaction_{ct} = \beta\ log(GDP_{ct}) + country\ and\ wave\ fixed\ effects$				
ln(GDP)	0.505***	0.638**	0.407***	0.170**
	(0.109)	(0.239)	(0.116)	(0.074)
N	166 observations	31 observations	135 observations	776 observations
	79 countries	10 countries	66 countries	31 countries
Panel B: Long differences				
$\Delta Life\ Satisfaction_{c,t} = \beta\ \Delta log(GDP_{ct})$				
ln(GDP)	0.47***	0.694*	0.35**	0.278*
	(0.128)	(0.387)	(0.163)	(0.164)
N	66 differences	10 differences	46 differences	30 differences

$\beta^{panel} \approx 0.35$

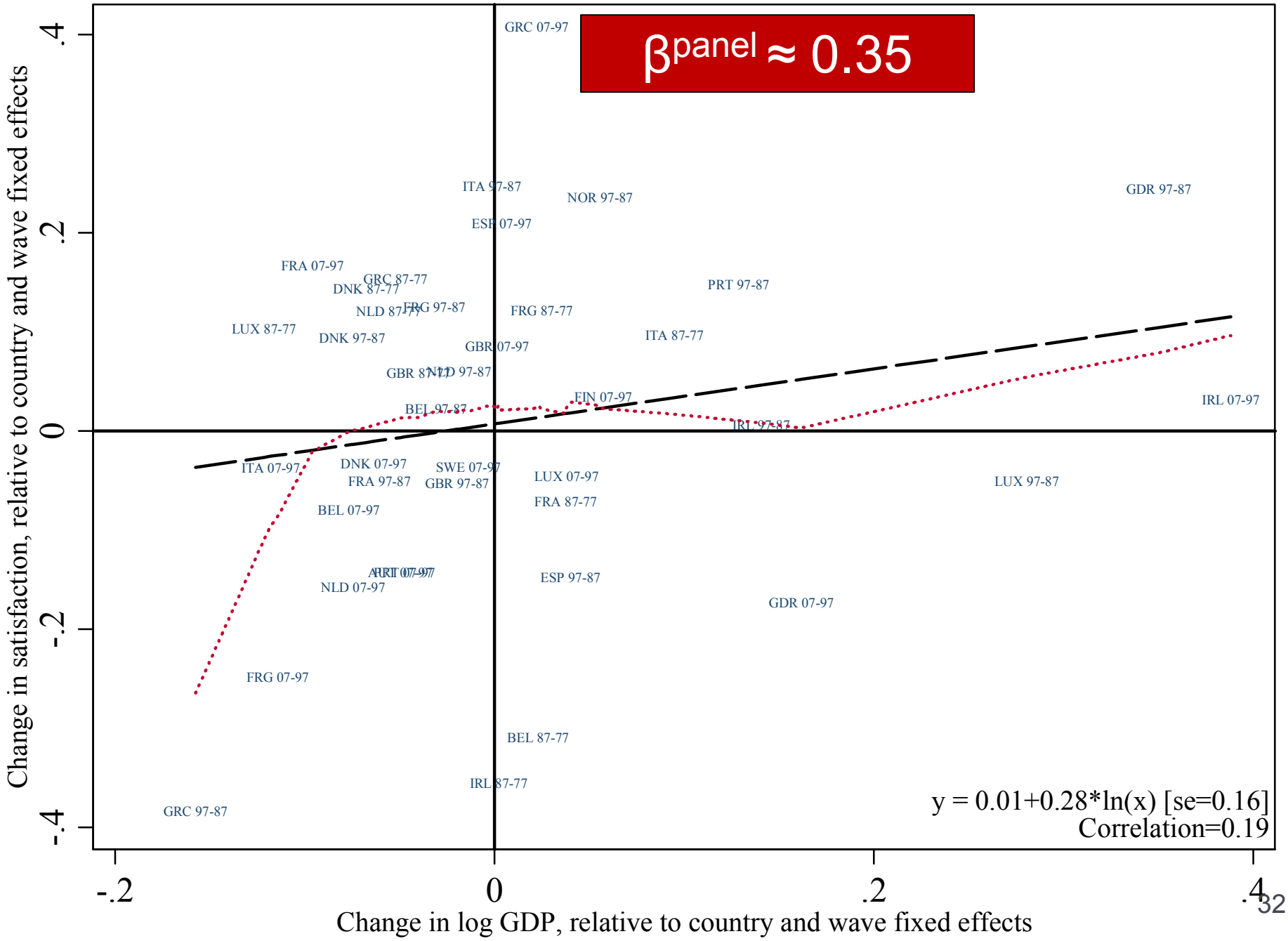
International Panel Data: Eurobarometer



Long Differences: World Values Survey



Long Differences: Eurobarometer



Conclusion: Stylized Facts about Well-being and Income

- Within-country comparisons
  - USA
  - All countries

$\beta_{within} \approx 0.35$

- Between countries:
  - Since 1946
  - Multiple datasets
  - Both happiness and life satisfaction
  - No evidence of satiation

$\beta_{between} \approx 0.35$

- National Time Series
  - Japan
  - USA
  - 9 European nations

$\beta_{time\ series} \approx 0.35$

- International Panel data
  - World Values Survey
  - Eurobarometer

$\beta_{international\ panel} \approx 0.35$

- Other measures of well-being
  - Pain, depression, smiling, good tasting food to eat, respect

Is there any evidence of satiation?

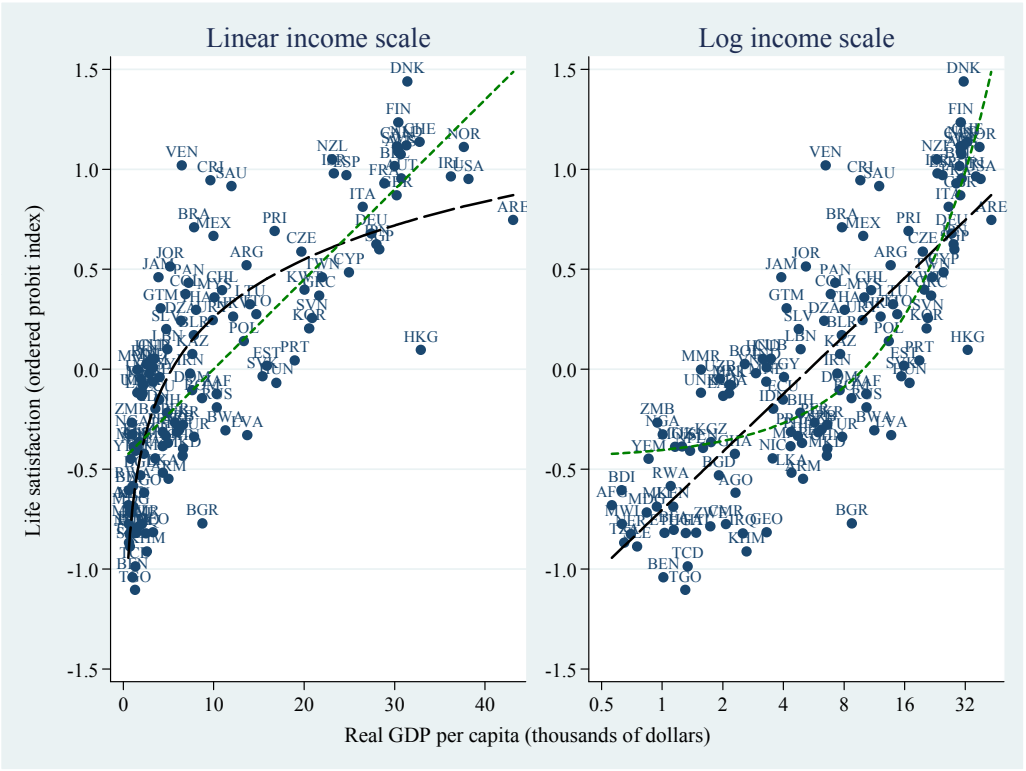
"if we compare countries, there is no evidence that richer countries are happier than poorer ones – so long as we confine ourselves to countries with incomes over $15,000 per head." - Layard (2005)

- Rich countries (GDP>$15,000)
  - Satisfaction=1.08*log(GDP) [se=0.21]
- Poor countries (GDP<$15,000)
  - Satisfaction=0.35*log(GDP) [se=0.04]
- A 1% rise in GDP:
  - Has three times larger effects in rich countries than poor countries
- A $100 rise in GDP
  - 3x larger effect in Jamaica than US
  - 20x larger effect in Burundi than US

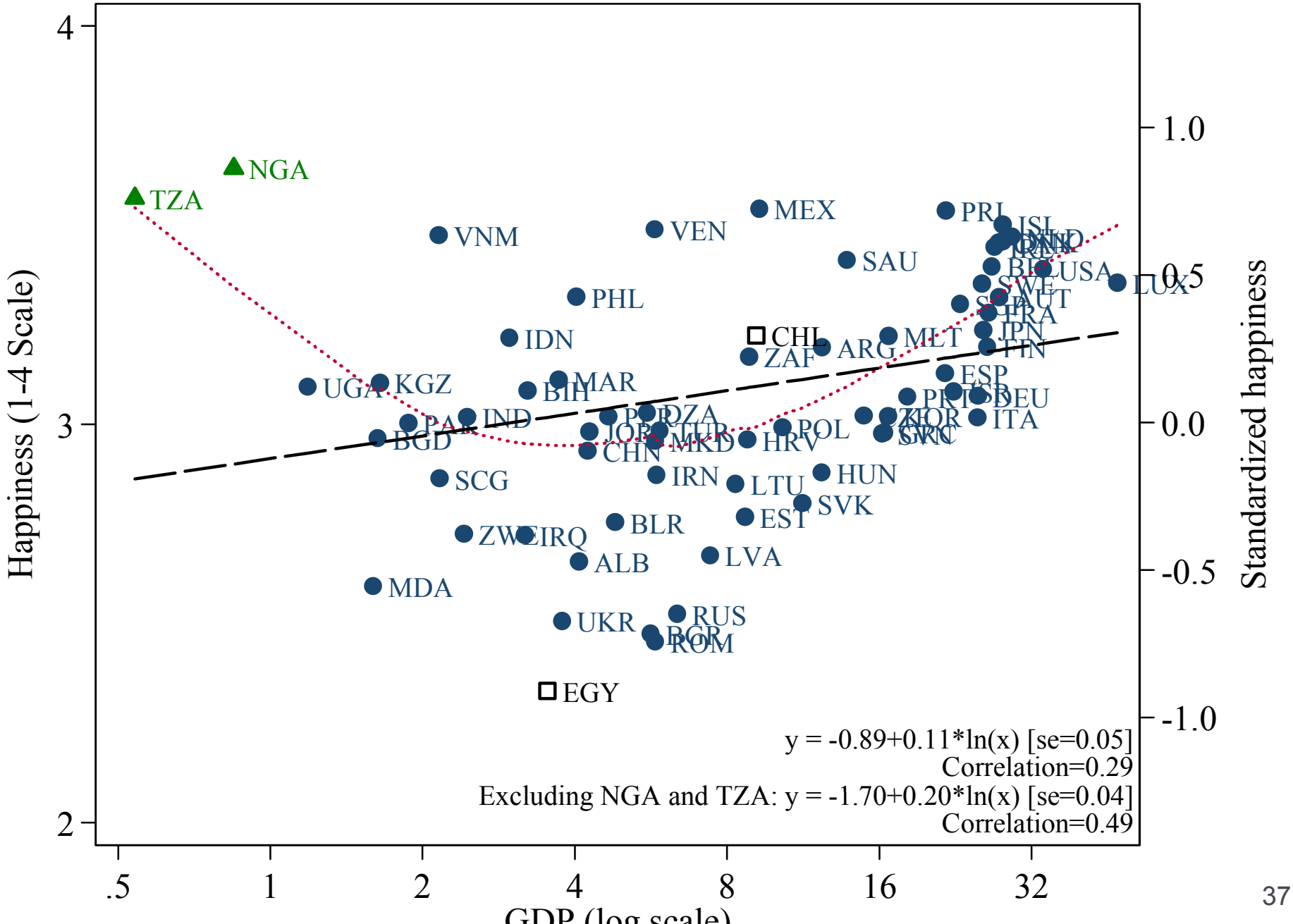
Is there any evidence of satiation?

❑ "*if we compare countries, there is no evidence that richer countries are happier than poorer ones – so long as we confine ourselves to countries with incomes over $15,000 per head.*" - Layard (2005)

- ❑ Rich countries (GDP>$15,000)
  - Satisfaction=1.08*log(GDP) [se=0.21]
- ❑ Poor countries (GDP<$15,000)
  - Satisfaction=0.35*log(GDP) [se=0.04]
- ❑ A 1% rise in GDP:
  - Has three times larger effects in rich countries than poor countries
- ❑ A $100 rise in GDP
  - 3x larger effect in Jamaica than US
  - 20x larger effect in Burundi than US



Happiness and GDP (World Values Survey)

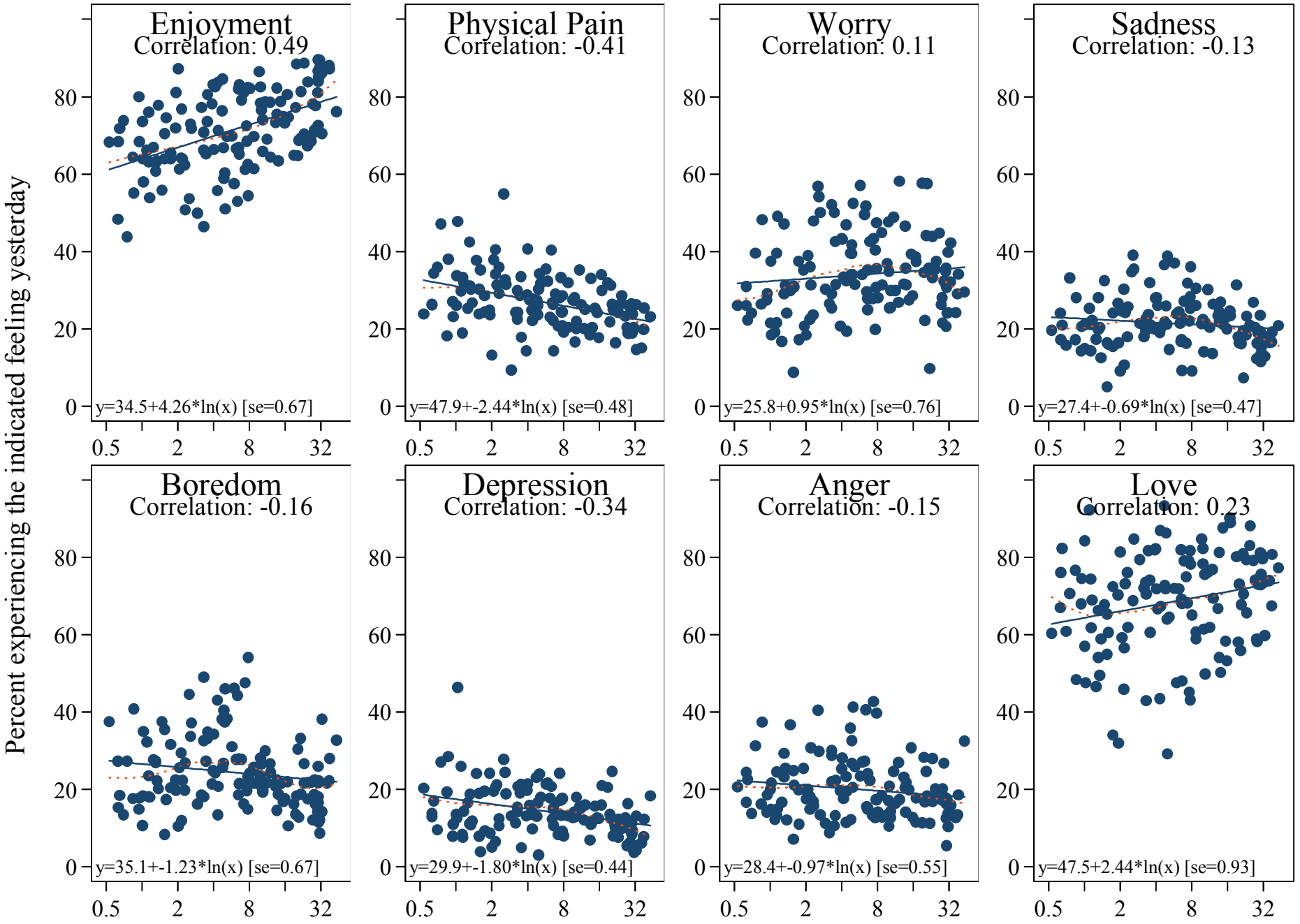


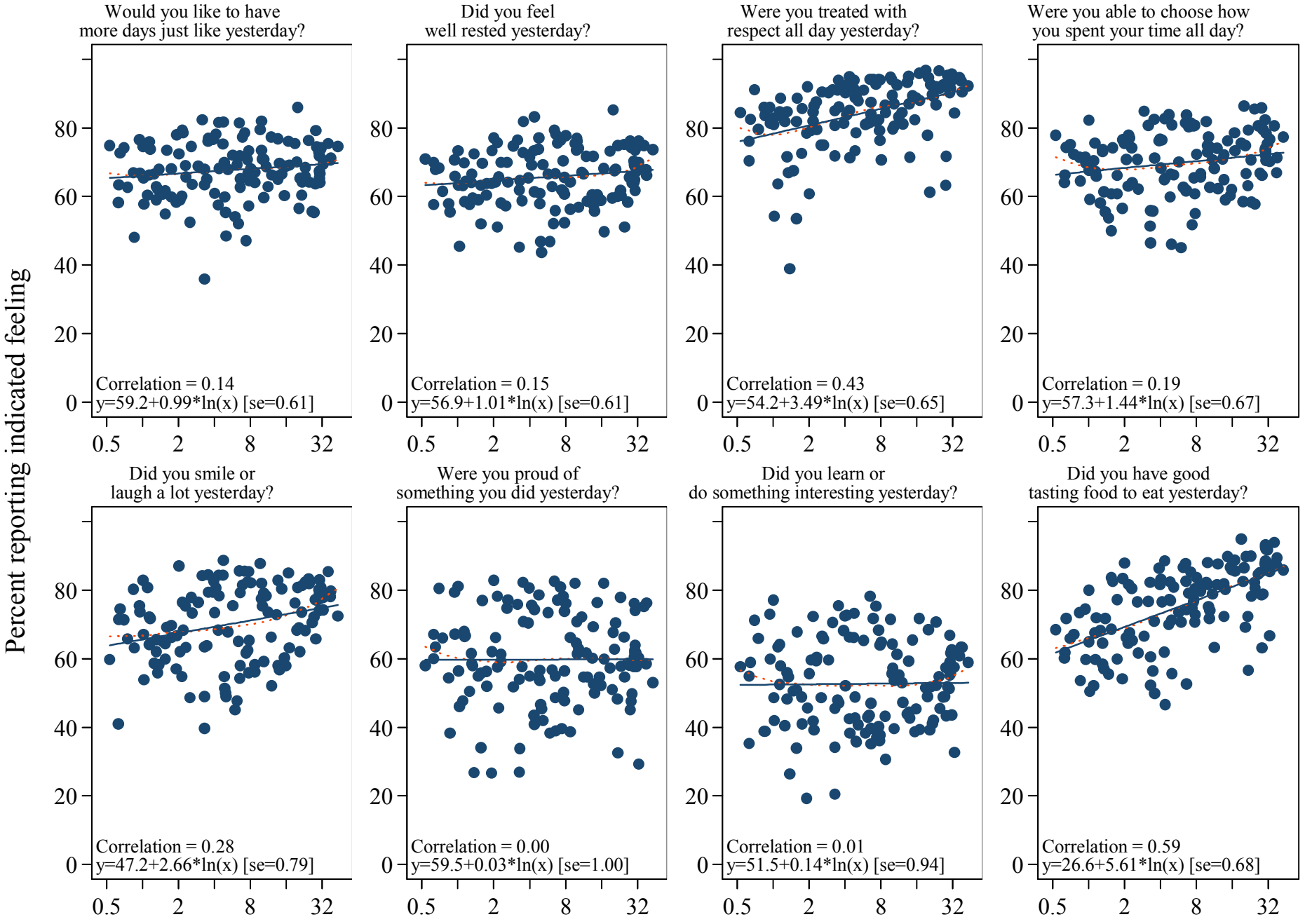
Happiness versus Life Satisfaction

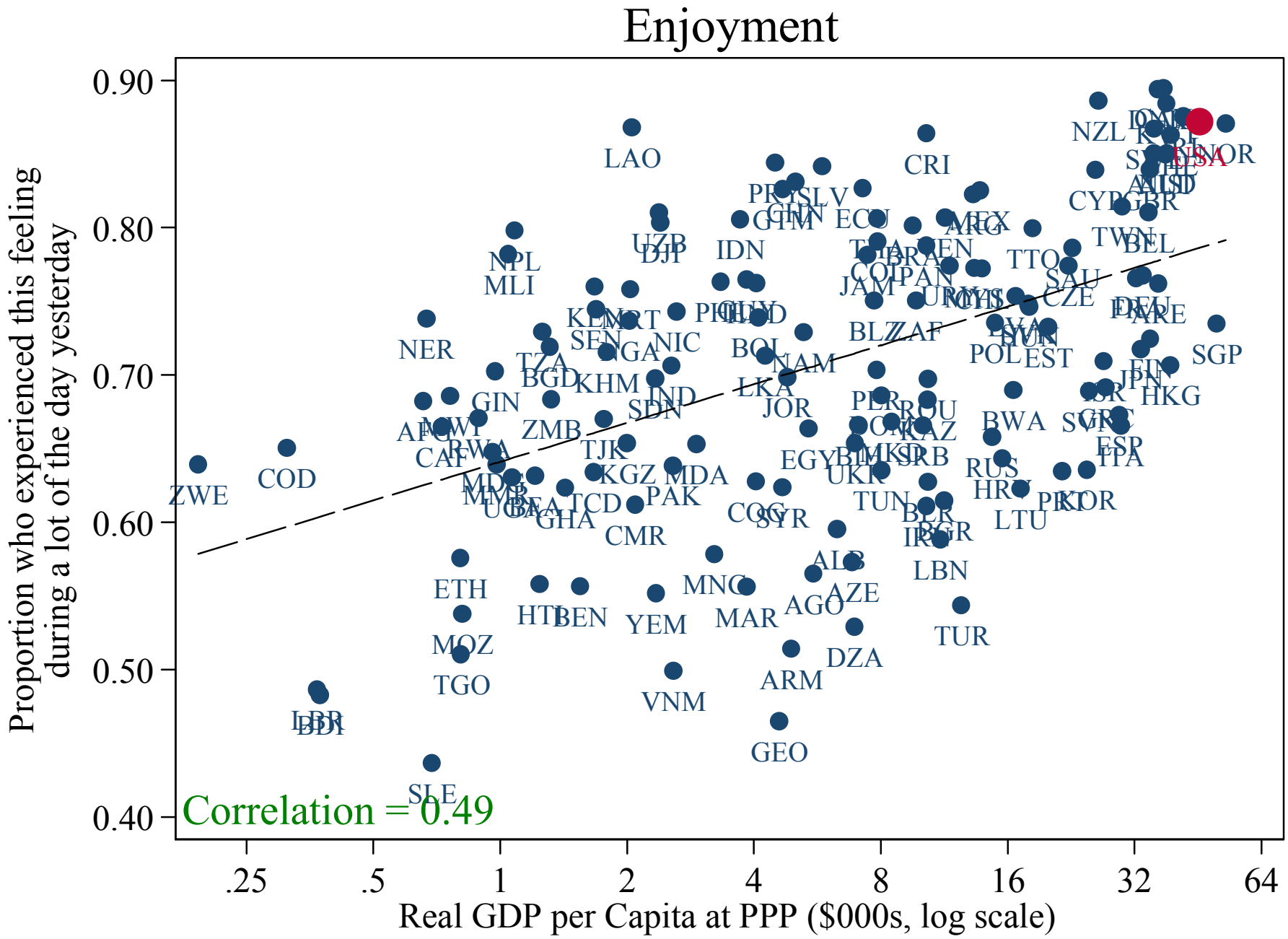
Sacks, Stevenson & Wolfers, Income and Happiness

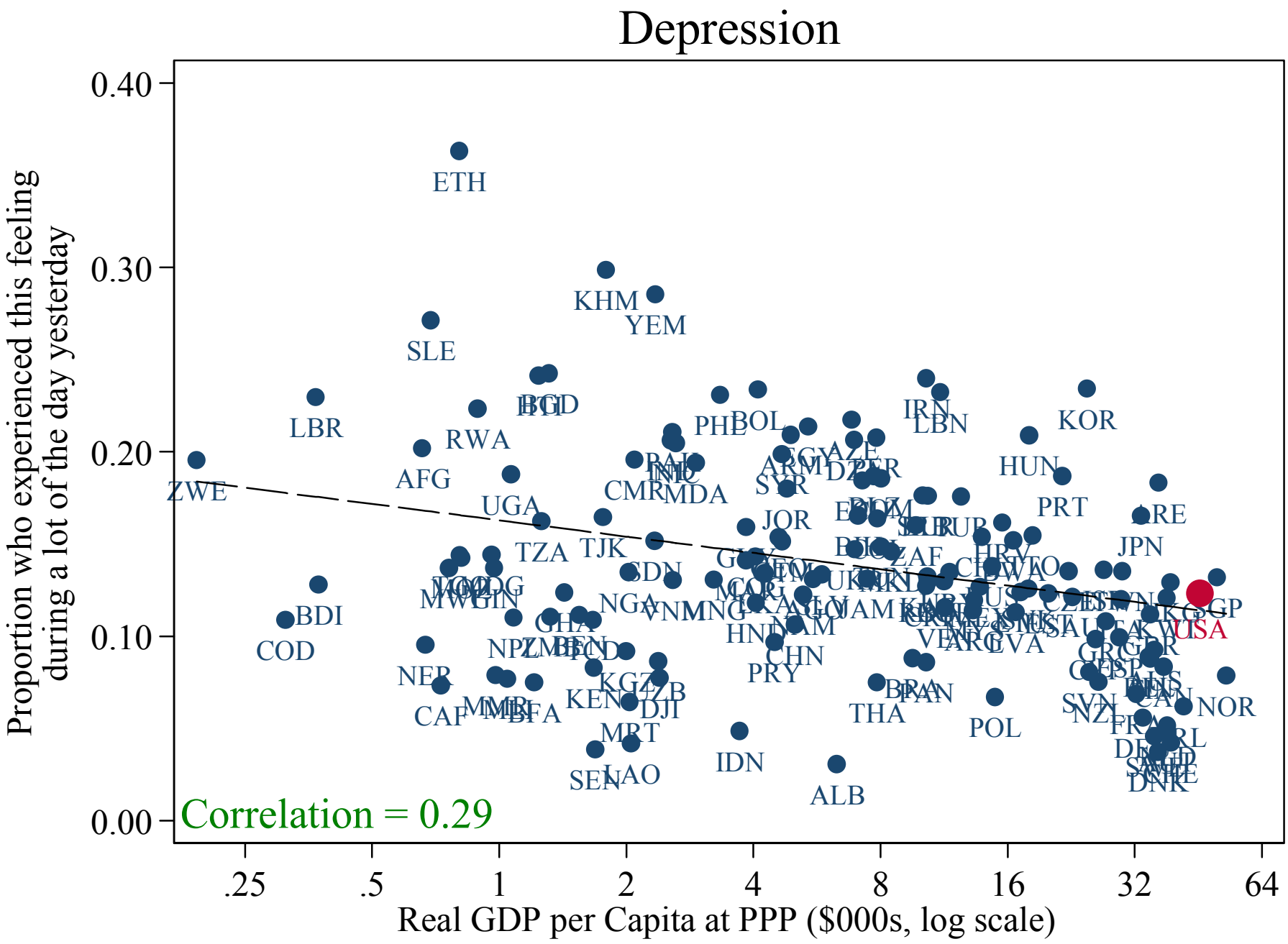
More Income is Associated with

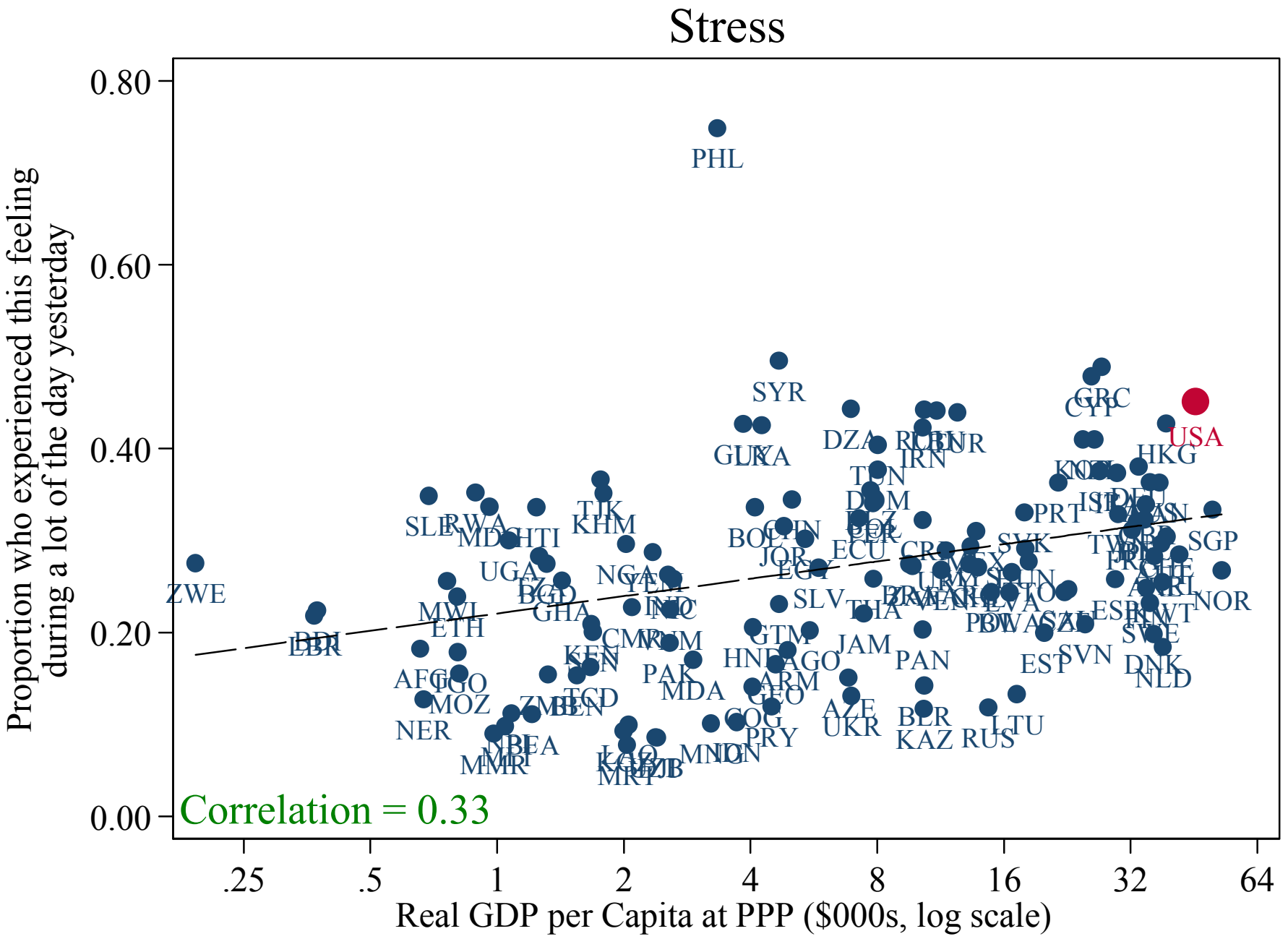
- Less Pain
- More Enjoyment
- Less Depression
- BUT More Stress
- How do people's days differ with income?
  - More likely to be treated with respect
  - More likely to eat good tasting food
  - More likely to smile or laugh
- And people are more likely to want to have more days like the one that they just had

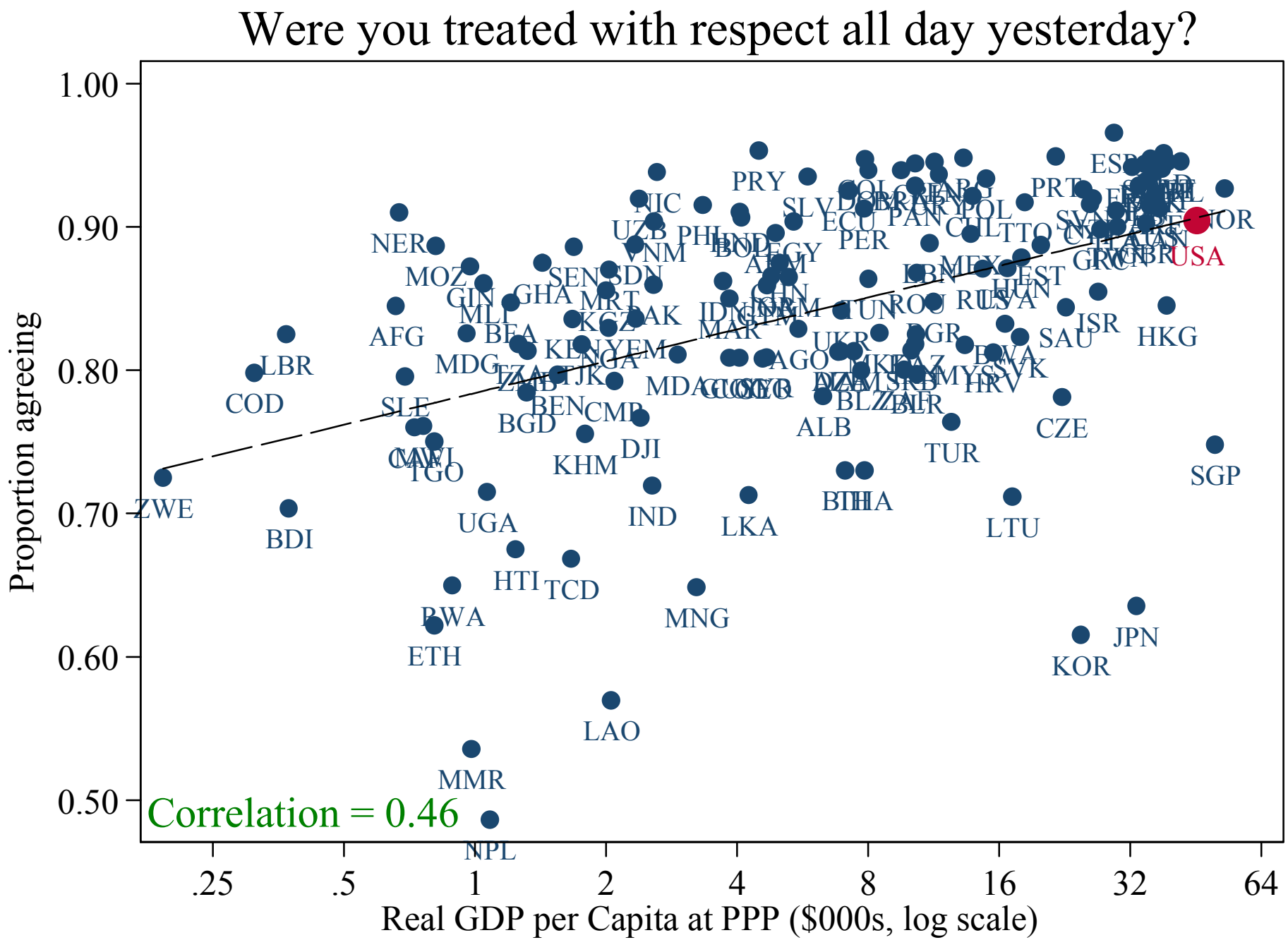

Enjoyment
Correlation: 0.49
y=34.5+4.26*ln(x) [se=0.67]
Physical Pain
Correlation: -0.41
y=47.9+-2.44*ln(x) [se=0.48]
Worry
Correlation: 0.11
y=25.8+0.95*ln(x) [se=0.76]
Sadness
Correlation: -0.13
y=27.4+-0.69*ln(x) [se=0.47]
Boredom
Correlation: -0.16
y=35.1+-1.23*ln(x) [se=0.67]
Depression
Correlation: -0.34
y=29.9+-1.80*ln(x) [se=0.44]
Anger
Correlation: -0.15
y=28.4+-0.97*ln(x) [se=0.55]
Love
Correlation: 0.23
y=47.5+2.44*ln(x) [se=0.93]
0
20
40
60
80
0.5
2
8
32
Percent experiencing the indicated feeling yesterday
Real GDP per capita (thousands of dollars, log scale)

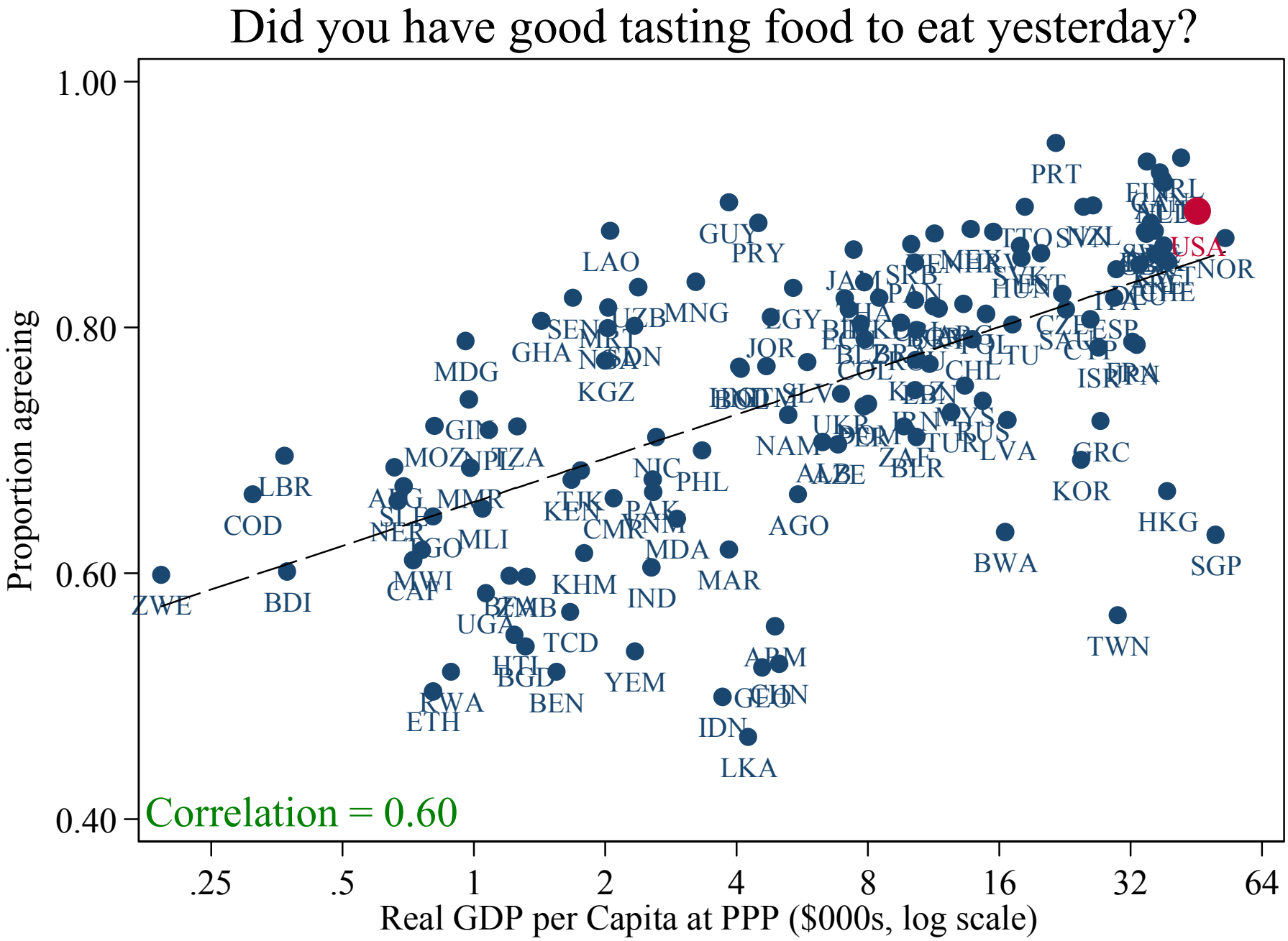

Would you like to have more days just like yesterday?
Correlation = 0.14
y=59.2+0.99*ln(x) [se=0.61]
Did you feel well rested yesterday?
Correlation = 0.15
y=56.9+1.01*ln(x) [se=0.61]
Were you treated with respect all day yesterday?
Correlation = 0.43
y=54.2+3.49*ln(x) [se=0.65]
Were you able to choose how you spent your time all day?
Correlation = 0.19
y=57.3+1.44*ln(x) [se=0.67]
Did you smile or laugh a lot yesterday?
Correlation = 0.28
y=47.2+2.66*ln(x) [se=0.79]
Were you proud of something you did yesterday?
Correlation = 0.00
y=59.5+0.03*ln(x) [se=1.00]
Did you learn or do something interesting yesterday?
Correlation = 0.01
y=51.5+0.14*ln(x) [se=0.94]
Did you have good tasting food to eat yesterday?
Correlation = 0.59
y=26.6+5.61*ln(x) [se=0.68]
Percent reporting indicated feeling
0
20
40
60
80
0.5
2
8
32
Real GDP per capita (thousands of dollars, log scale)

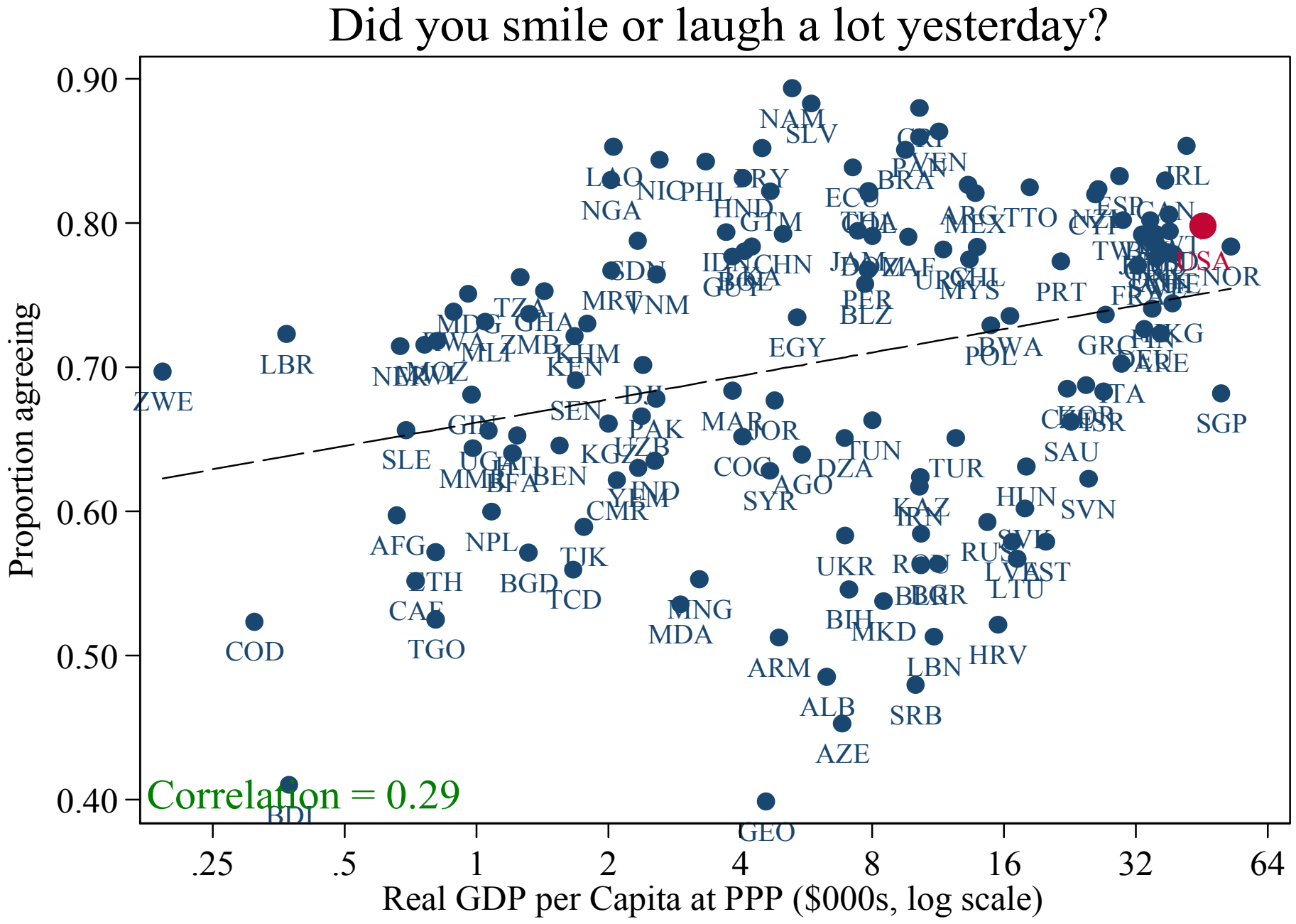

Enjoyment
Proportion who experienced this feeling during a lot of the day yesterday
Real GDP per Capita at PPP ($000s, log scale)
Correlation = 0.49
0.90
0.80
0.70
0.60
0.50
0.40
.25
.5
1
2
4
8
16
32
64
LAO
CRI
NZL
NOR
CYP
GBR
TWN
BEL
IDN
NPL
MLI
UZB
DJI
TTO
SAU
CZE
JAM
NER
SEN
NIC
BOL
NAM
POL
EST
SGP
TZA
BGD
KHM
LKA
JOR
HKG
GIN
SDN
ZMB
BWA
TJK
KGZ
MDA
PAK
EGY
UKR
RUS
ESP
ITA
ZWE
COD
TCD
GHA
CMR
TUN
LTU
KOR
SYR
LBN
ETH
MNG
AZE
AGO
HTI
BEN
YEM
MAR
TUR
MOZ
DZA
TGO
ARM
VNM
GEO
SLE

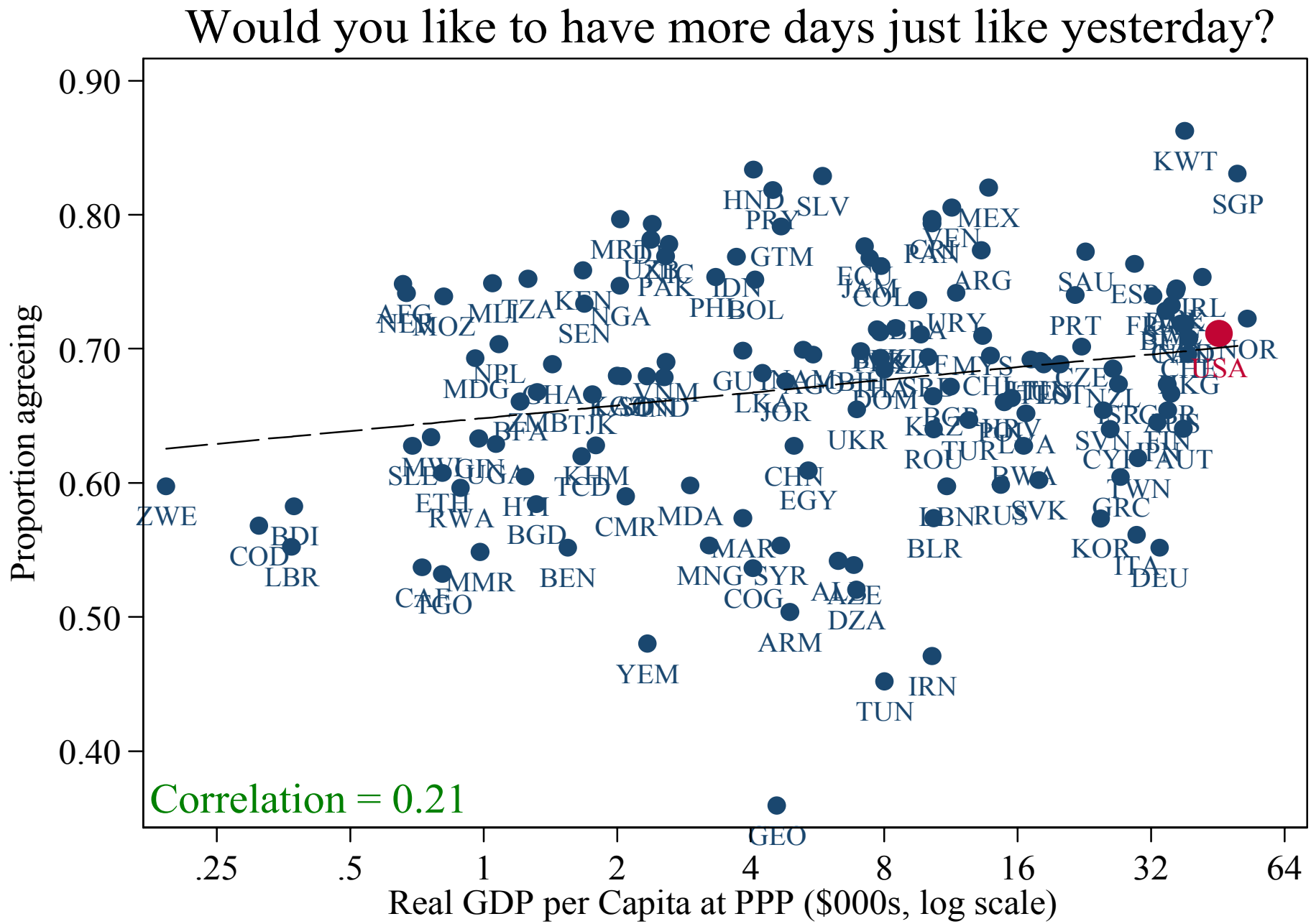

Depression
Proportion who experienced this feeling during a lot of the day yesterday
Real GDP per Capita at PPP ($000s, log scale)
0.00
0.10
0.20
0.30
0.40
.25
.5
1
2
4
8
16
32
64
Correlation = 0.29
ETH
KHM
YEM
SLE
LBR
RWA
AFG
ZWE
UGA
TZA
TJK
CMR
MDA
PHE
BOL
IRN
LBN
KOR
HUN
PRT
ARE
JPN
JOR
SYR
SDN
NGA
BDI
COD
NER
CAF
KEN
DJI
MRT
SEN
LAO
IDN
ALB
THA
POL
NOR
USA
GP
DNK
CHN
PRY
HND
NAM
ZAF
LVA
NZL
SVN
FRA
DEU
GRC
ESP
CAN
KGZ
ZZB
BFA
GHA
NPL
MWI
GIN
MDG
MNG
VNM
UKR
MKD
JAM
KAZ
ARM
AZE
DZA
PER
EGY
BGD
HTI
BGD

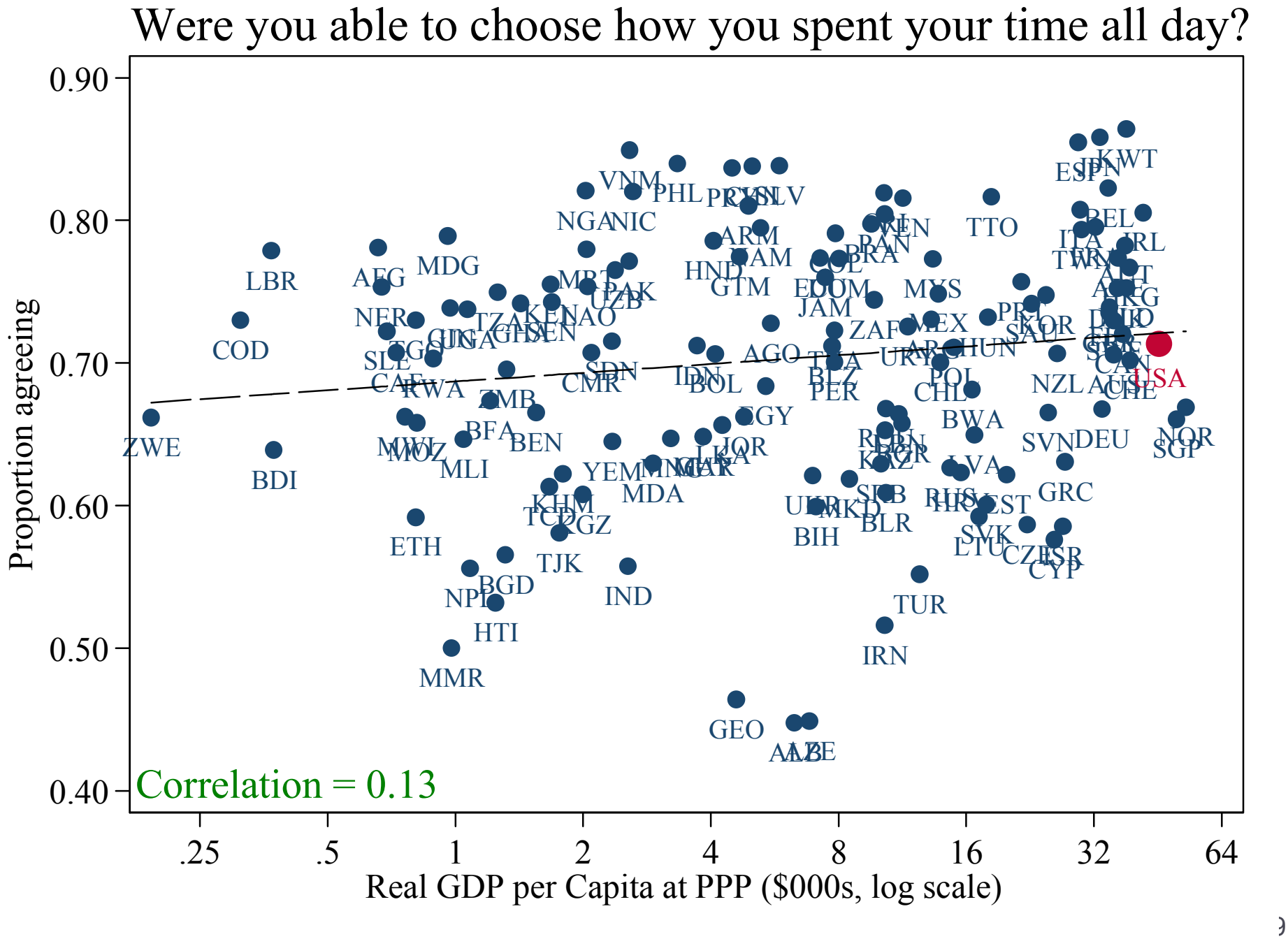

Stress
Proportion who experienced this feeling during a lot of the day yesterday
0.00
0.20
0.40
0.60
0.80
.25
.5
1
2
4
8
16
32
64
Real GDP per Capita at PPP ($000s, log scale)
Correlation = 0.33
USA
PHL
SYR
ZWE
SGP
NOR
HKG
PRT
EST
SVN
DNK
NLD
PAN
JAM
SLV
ECU
DZA
IRN
TUN
UKR
KAZ
RUS
LTU
BLR
AZE
GTM
HND
PRY
COG
MDA
PAK
KHM
TJK
UGA
GHA
ETH
MWI
NER
MOZ
AFG
SLE
RWA
HTI
NGA
YEM
KEN
TCD
BEN
MRT
MNG
ARM
GEO
AGO
JOR
EGY
GRC
CYP
SVK
SWE
ESP
ISR
TWN
KOR
ARG
CHL
URY
BRA
VEN
PER
BOL
CRI
PAN
MKD
ALB
BGR
ROU
MDA
LAO
KGZ
MMR
BEN
TGO
BDI
LBR

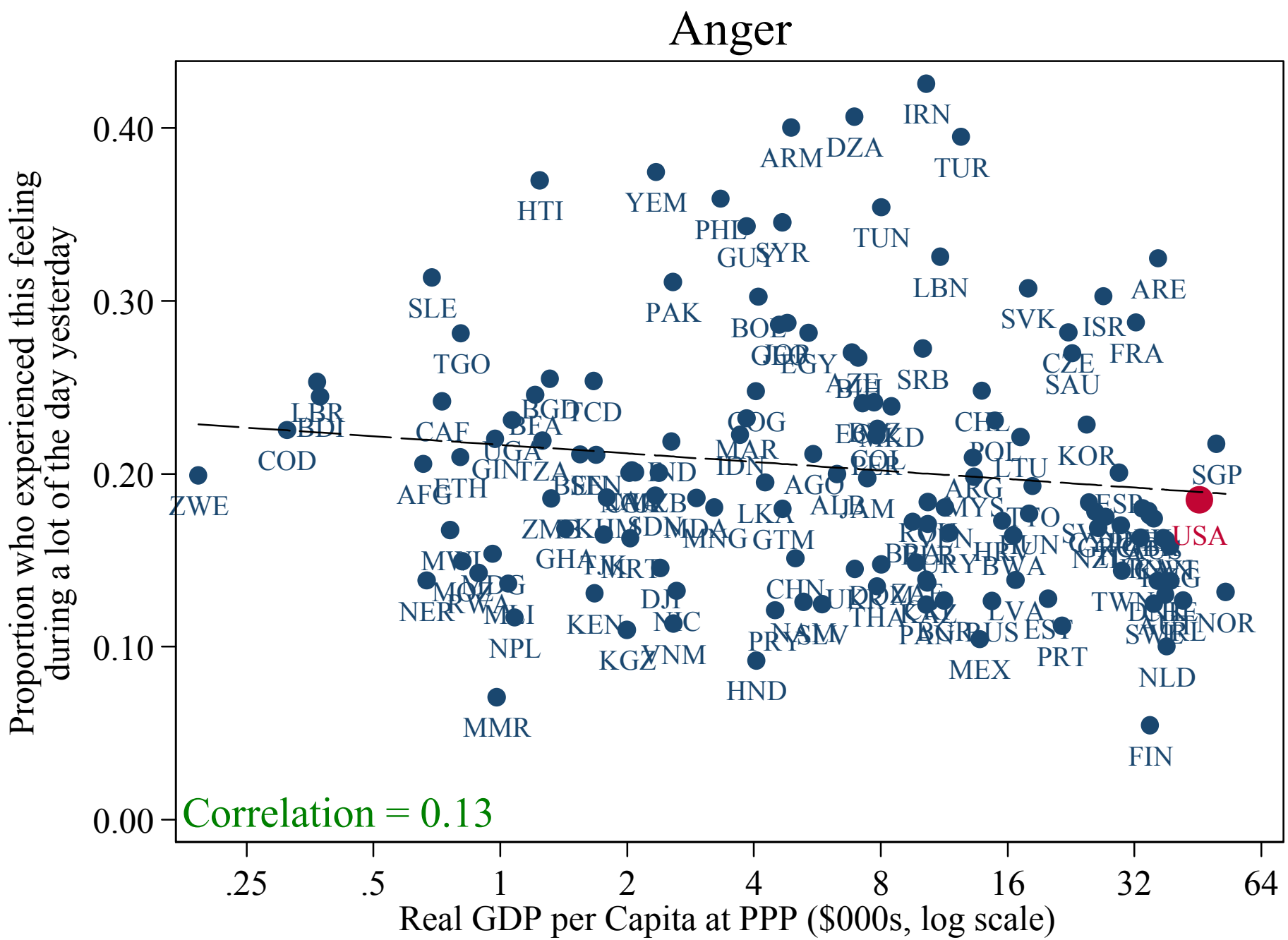

Were you treated with respect all day yesterday?
Proportion agreeing
1.00
0.90
0.80
0.70
0.60
0.50
Real GDP per Capita at PPP ($000s, log scale)
.25
.5
1
2
4
8
16
32
64
Correlation = 0.46
USA
NOR
ZWE
BDI
COD
LBR
AFG
SLE
TGO
UGA
HTI
TCD
RWA
ETH
MMR
NPL
LAO
KHM
BGD
MDG
MOZ
NER
MLI
GIN
GHA
SEN
MRT
KGZ
PAK
YEM
TJK
BEN
CMR
DJI
IND
LKA
MNG
KOR
JPN
SGP
LTU
TUR
ALB
CZE
SAU
ISR
HKG
PER
PRY
PRT
ESP
MEX
EST
ROU
RUS
USA
UKR
AGO
MAR
MDA
HRV
SVK
MYS
BLR
ECU
PAN
POL
CHL
TTO
GRC
NIC
UZB
VNM
SLV
COL
BOL
EGY
ARM
GEO
TUN
DGR
BWA
ZAF
BLZ
THA

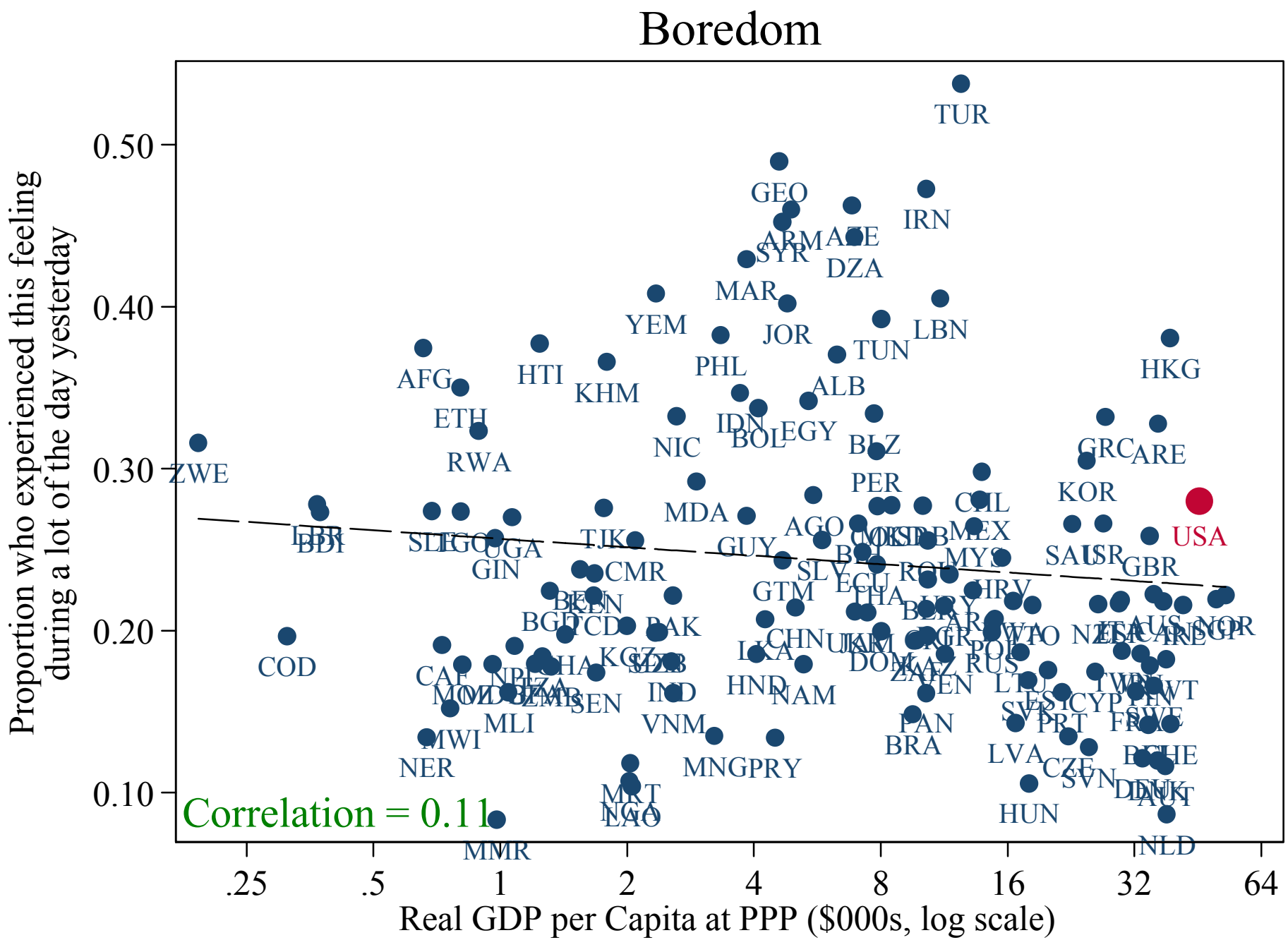

Did you have good tasting food to eat yesterday?
Proportion agreeing
1.00
0.80
0.60
0.40
.25
.5
1
2
4
8
16
32
64
Real GDP per Capita at PPP ($000s, log scale)
Correlation = 0.60
USA
PRT
GUY
PRY
LAO
MNG
EGY
JOR
GHA
MDG
KGZ
NAM
PHL
LBR
COD
ZWE
BDI
MLI
KHM
IND
MAR
AGO
BWA
KOR
HKG
SGP
GRC
LVA
TWN
TCD
YEM
BEN
ETH
IDN
LKA
ARM
CHL
COL
UKR
RUS
TUR
ZAF
BLR
PAN
JAM
SRB
HUN
CZE
ESP
ITA
NOR
ISR
MDA
PAK
CMR
KEN
TJK
NIC
MOZ
TZA
MMR
NER
TGO
MWI
CAF
UGA
HTI
BGD
RWA
ZMB
SLV
BOL
ARG
SLE
NPL
GIN
UZB
SEN
MRT
SDN
NSA
IRN
MYS
EST
LTU
SAU
CYP
PRN
ISR

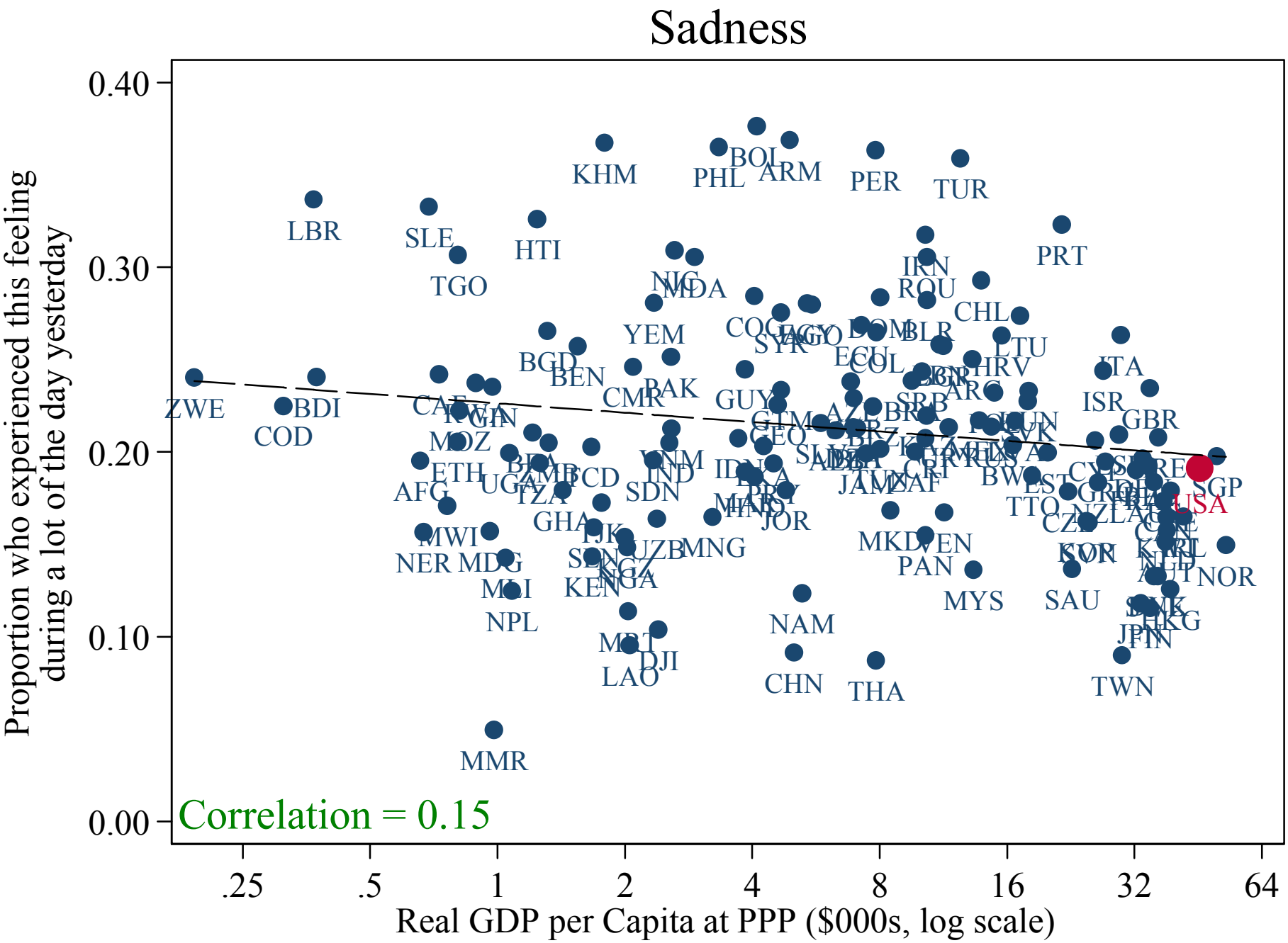

Did you smile or laugh a lot yesterday?
Proportion agreeing
Real GDP per Capita at PPP ($000s, log scale)
Correlation = 0.29
0.90
0.80
0.70
0.60
0.50
0.40
.25
.5
1
2
4
8
16
32
64
NAM
SLV
LAO
NIC
PHL
NGA
HND
GTM
ECU
BRA
TTO
MEX
JRL
ESP
CAN
USA
NOR
SDN
CHN
MRT
VNM
PER
BLZ
MYS
PRT
FRA
TZA
GHA
MDG
ZMB
KHM
KEN
EGY
BWA
POL
GRC
MKG
ARE
LBR
ZWE
SEN
DJI
PAK
MAR
JOR
ITA
SGP
SLE
KGZ
UZB
COG
TUN
DZA
TUR
SAU
BEN
AGO
SYR
HUN
SVN
CMR
KAZ
IRN
AFG
NPL
TJK
UKR
RUS
LVA
EST
LTU
ETH
BGD
TCD
CAF
MNG
MDA
BIH
MKD
HRV
COD
TGO
ARM
LBN
ALB
SRB
AZE
BDI
GEO

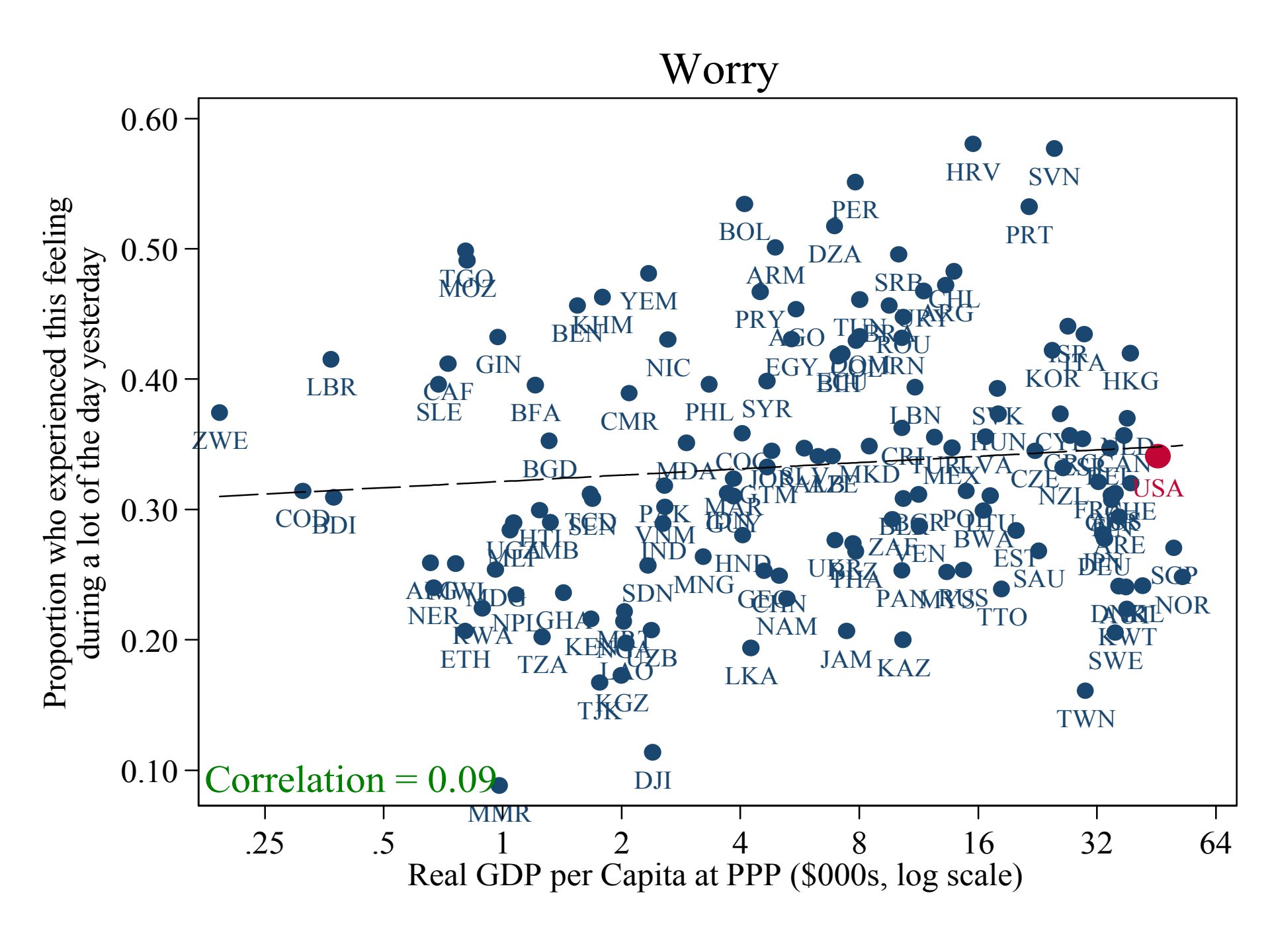

Would you like to have more days just like yesterday?
Proportion agreeing
0.90
0.80
0.70
0.60
0.50
0.40
Real GDP per Capita at PPP ($000s, log scale)
.25
.5
1
2
4
8
16
32
64
Correlation = 0.21
KWT
SGP
HND
SLV
PRY
MEX
GTM
ARG
SAU
PRT
NOR
USA
AKG
UKR
ROU
TUR
BWA
SVK
GRC
KOR
ITA
DEU
BLR
RUS
TWN
AUT
CYP
SVN
CZE
NZL
URY
COL
ECU
JAM
IDN
PHL
BOL
PAK
NGA
SEN
KEN
TZA
MLI
MOZ
AFG
NPL
MDG
GHA
VNM
LKA
JOR
DOM
MYS
CHL
BGD
KHM
TCD
CMR
MDA
EGY
CHN
ETH
RWA
HTI
BGD
BEN
MMR
TGO
CAF
ZWE
BDI
COD
LBR
MAR
MNG
SYR
COG
ARM
DZA
YEM
IRN
TUN
GEO

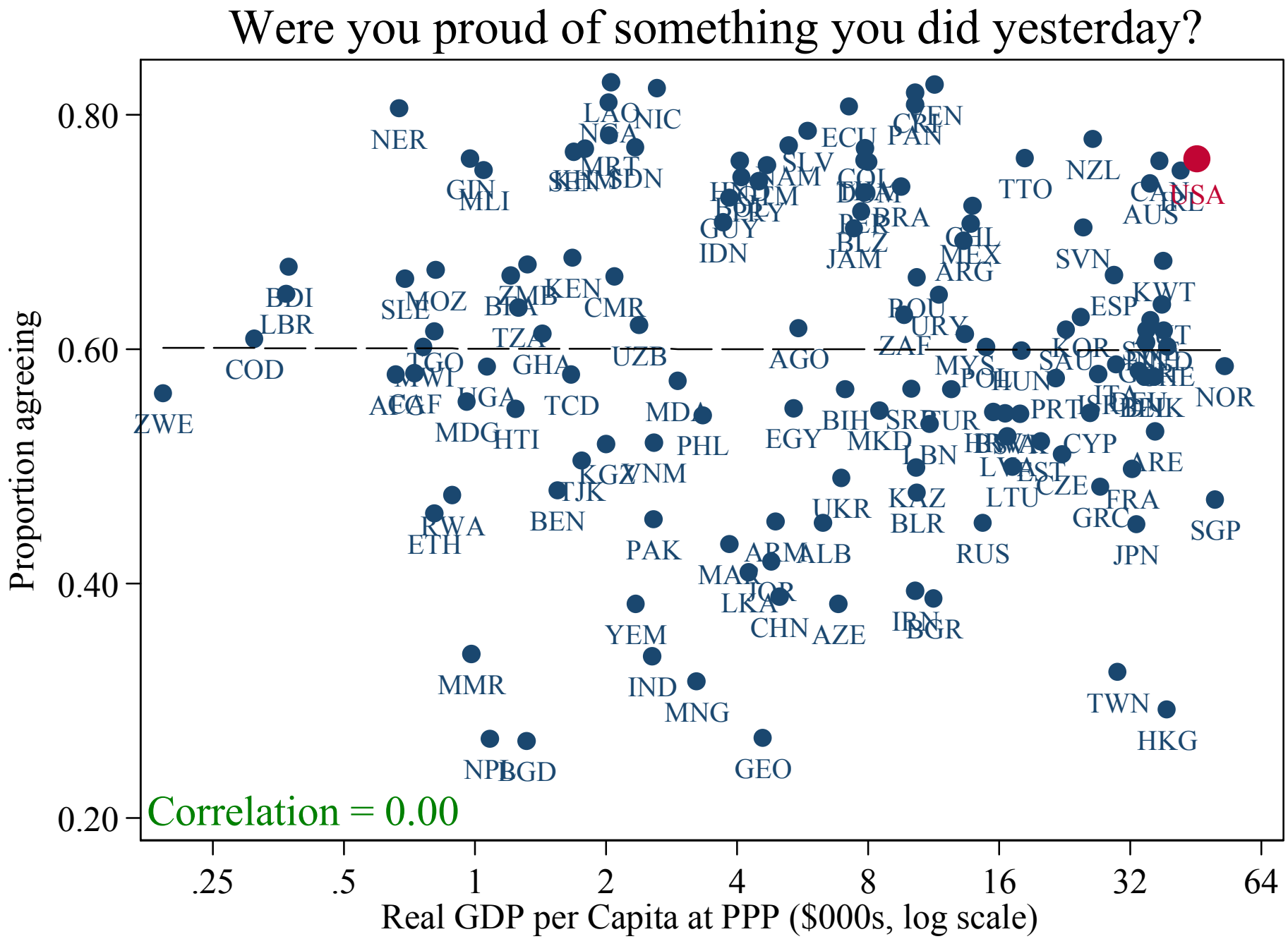

Were you able to choose how you spent your time all day?
Proportion agreeing
0.90
0.80
0.70
0.60
0.50
0.40
.25
.5
1
2
4
8
16
32
64
Real GDP per Capita at PPP ($000s, log scale)
Correlation = 0.13
USA
ZWE
BDI
LBR
COD
AFG
MDG
NER
SLE
RWA
ZMB
BFA
BEN
MLI
ETH
NPL
BGD
HTI
MMR
TJK
KGZ
KHM
YEM
MDA
IND
CMR
SDN
NGA
NIC
VNM
PHL
ARM
HND
GTM
AGO
EGY
JOR
BOL
PER
JAM
ZAF
MEX
MYS
TTO
BWA
SVN
DEU
NOR
SGP
GRC
LVA
EST
SVK
LTU
CYP
TUR
IRN
BIH
BLR
GEO
KWT
BEL
IRL
NZL
CHL
POL
HUN
ESP
JPN

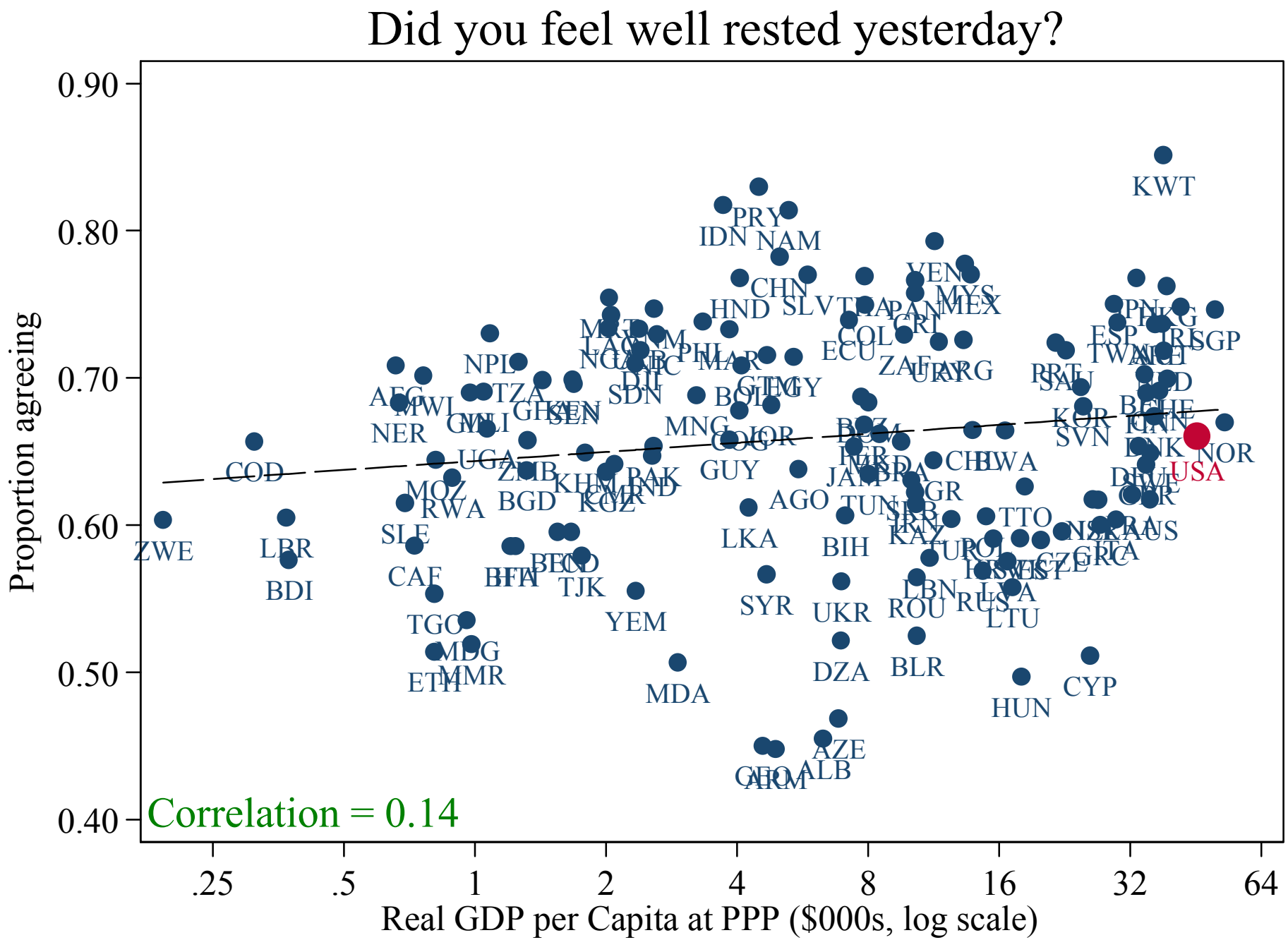

Anger
Proportion who experienced this feeling during a lot of the day yesterday
Real GDP per Capita at PPP ($000s, log scale)
0.00
0.10
0.20
0.30
0.40
.25
.5
1
2
4
8
16
32
64
Correlation = 0.13
IRN
DZA
ARM
TUR
HTI
YEM
PHL
TUN
GUY
SYR
LBN
ARE
SLE
PAK
SVK
ISR
BOL
FRA
TGO
EGY
CZE
SAU
SRB
LBR
BDI
TCD
CAF
BFA
COG
CHL
COD
UGA
MAR
KOR
POL
IDN
LTU
SGP
ZWE
AFG
ETH
AGO
ARG
LKA
JAM
MYS
USA
GTM
GHA
BWA
CHN
DJI
NER
KEN
NIC
LVA
NOR
NPL
KGZ
VNM
PRY
PAN
MEX
PRT
NLD
HND
MMR
FIN

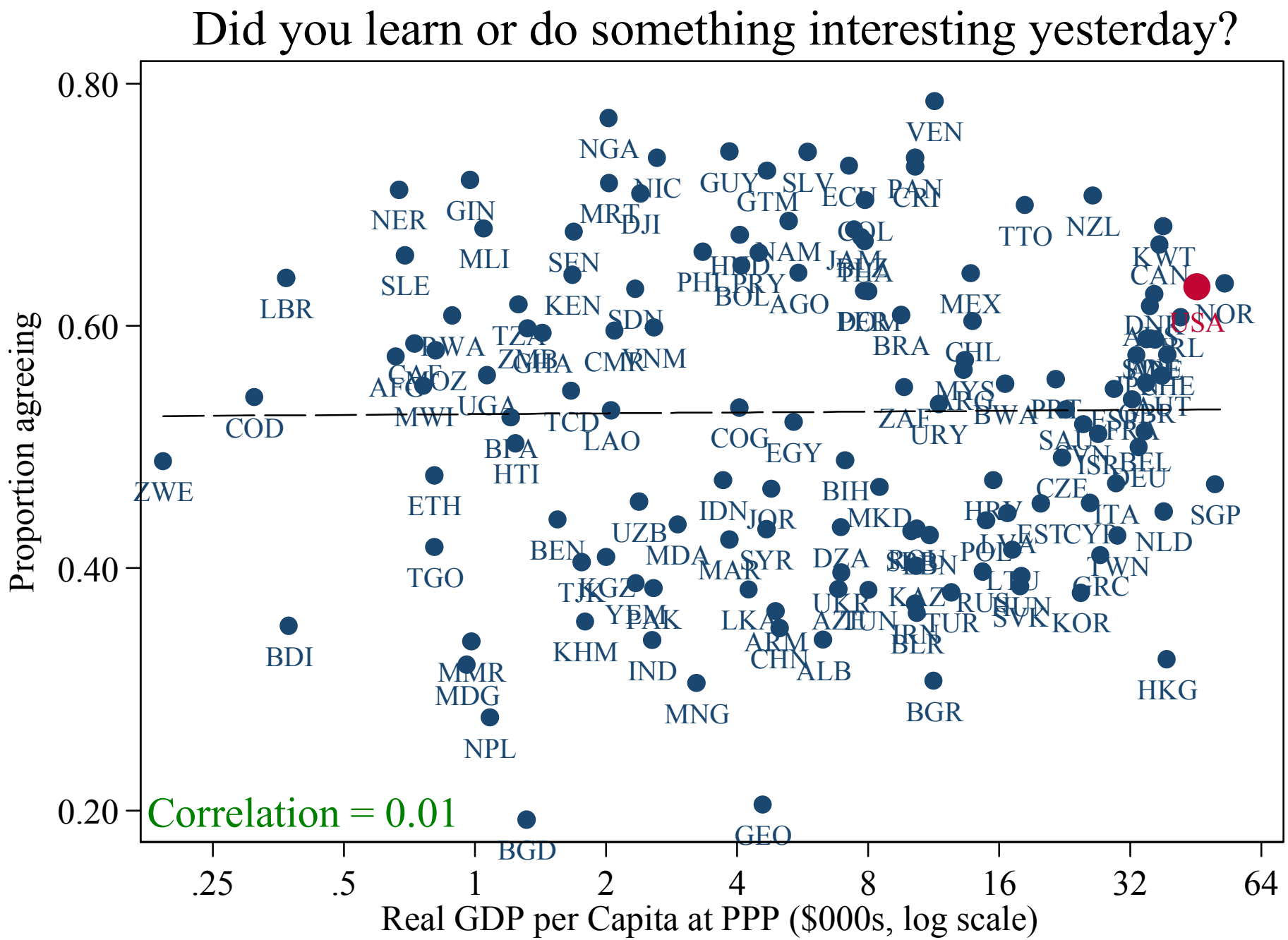

Boredom
Proportion who experienced this feeling during a lot of the day yesterday
Real GDP per Capita at PPP ($000s, log scale)
0.50
0.40
0.30
0.20
0.10
.25
.5
1
2
4
8
16
32
64
Correlation = 0.11
TUR
GEO
IRN
ARM
AZE
SYR
DZA
MAR
YEM
JOR
LBN
TUN
PHL
HKG
AFG
HTI
KHM
ALB
ETH
IDN
EGY
BOL
NIC
BLZ
GRC
ARE
ZWE
RWA
PER
KOR
MDA
CHL
AGO
MEX
USA
GUY
MYS
SAU
USR
GBR
GIN
CMR
SLV
ECU
GTM
HRV
COD
PAK
CHN
LKA
HND
NAM
RUS
CAF
SEN
IND
VNM
PAN
BRA
MLI
MWI
NER
MNG
PRY
LVA
CZE
SVN
HUN
MRT
NGA
LAO
MMR
NLD

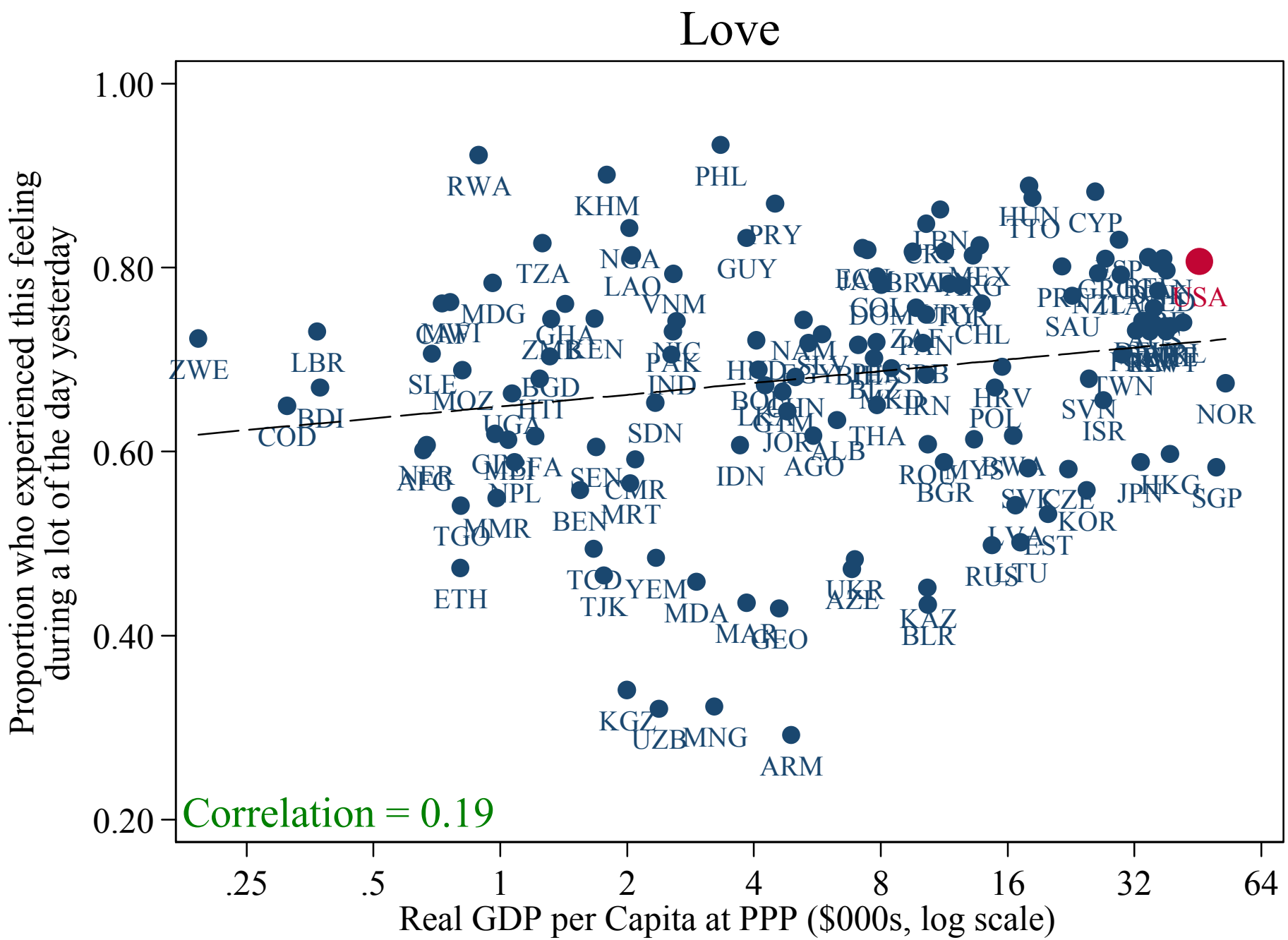

Sadness
Proportion who experienced this feeling during a lot of the day yesterday
Real GDP per Capita at PPP ($000s, log scale)
0.00
0.10
0.20
0.30
0.40
.25
.5
1
2
4
8
16
32
64
Correlation = 0.15
KHM
PHL
BOL
ARM
PER
TUR
LBR
SLE
HTI
TGO
PRT
IRN
ROU
CHL
YEM
BGD
BEN
LTU
ITA
ZWE
BDI
COD
CMR
PAK
GUY
ISR
GBR
ETH
AFG
SDN
JOR
MKD
VEN
PAN
MYS
SAU
NOR
USA
SGP
MWI
NER
MDG
MLI
NPL
KEN
MNG
NAM
CHN
THA
LAO
DJI
MMR
TWN
JPN
FIN
HKG

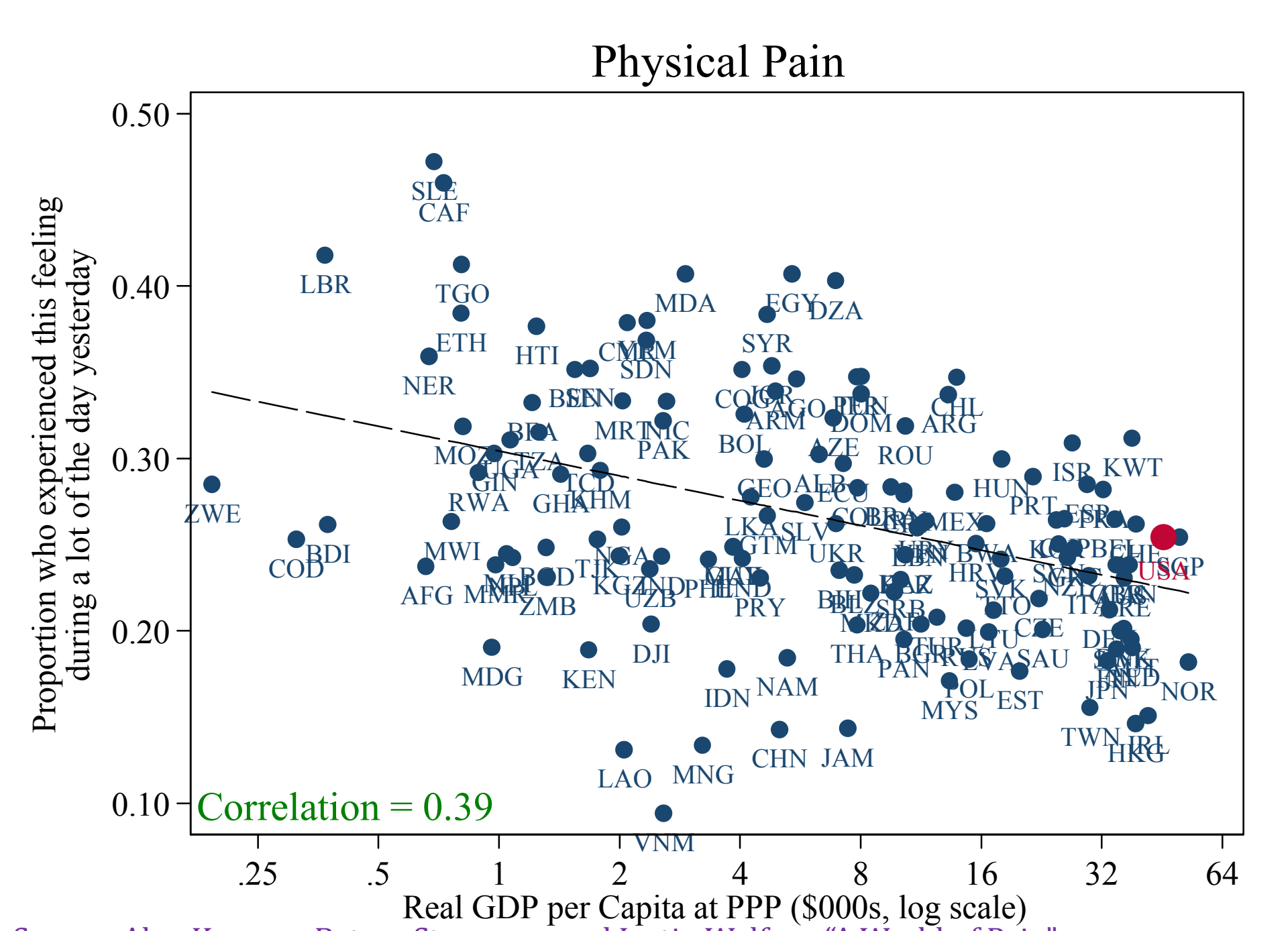

Worry
Proportion who experienced this feeling during a lot of the day yesterday
0.60
0.50
0.40
0.30
0.20
0.10
Correlation = 0.09
.25
.5
1
2
4
8
16
32
64
Real GDP per Capita at PPP ($000s, log scale)
USA


Were you proud of something you did yesterday?
Proportion agreeing
0.80
0.60
0.40
0.20
.25
.5
1
2
4
8
16
32
64
Real GDP per Capita at PPP ($000s, log scale)
Correlation = 0.00
NER
LAO
NIC
NGA
MRT
SDN
GIN
MLI
ECU
SLV
NAM
COL
PAN
TTO
NZL
USA
AUS
GUY
IDN
BRA
BLZ
JAM
MEX
ARG
SVN
BDI
LBR
COD
SLE
MOZ
KEN
CMR
TZA
GHA
UZB
AGO
ZAF
URY
ESP
KWT
TGO
MWI
UGA
TCD
MDA
PHL
EGY
BIH
MKD
TUR
LBN
CYP
ARE
NOR
ZWE
MDG
HTI
KGZ
VNM
TJK
BEN
KWA
ETH
PAK
UKR
KAZ
BLR
LTU
CZE
FRA
GRC
SGP
JPN
RUS
ALB
MAR
JOR
LKA
CHN
AZE
YEM
IND
MNG
MMR
NPL
BGD
GEO
TWN
HKG


Did you feel well rested yesterday?
Proportion agreeing
0.90
0.80
0.70
0.60
0.50
0.40
.25
.5
1
2
4
8
16
32
64
Real GDP per Capita at PPP ($000s, log scale)
Correlation = 0.14
KWT
PRY
IDN
NAM
CHN
HND
SLV
VEN
MYS
MEX
PAN
CRI
COL
ECU
ZAF
URY
ARG
NPL
TZA
AFG
MWI
NER
COD
UGA
ZMB
MOZ
RWA
BGD
SLE
ZWE
LBR
BDI
CAF
TGO
MDG
ETH
MMR
TJK
YEM
MDA
SDN
MNG
GUY
AGO
LKA
SYR
UKR
DZA
AZE
ALB
ARM
BIH
TUN
JAM
CHL
BWA
TTO
LBN
ROU
RUS
LTU
BLR
HUN
CYP
SVN
KOR
NOR
USA
SGP
ESP
TWA
PRT
SAU
DNK
DEU
GRC
CZE
ITA
AUS
NZL
KAZ
GR
BRA
PAK
KHM
KGZ
MDG
ETH

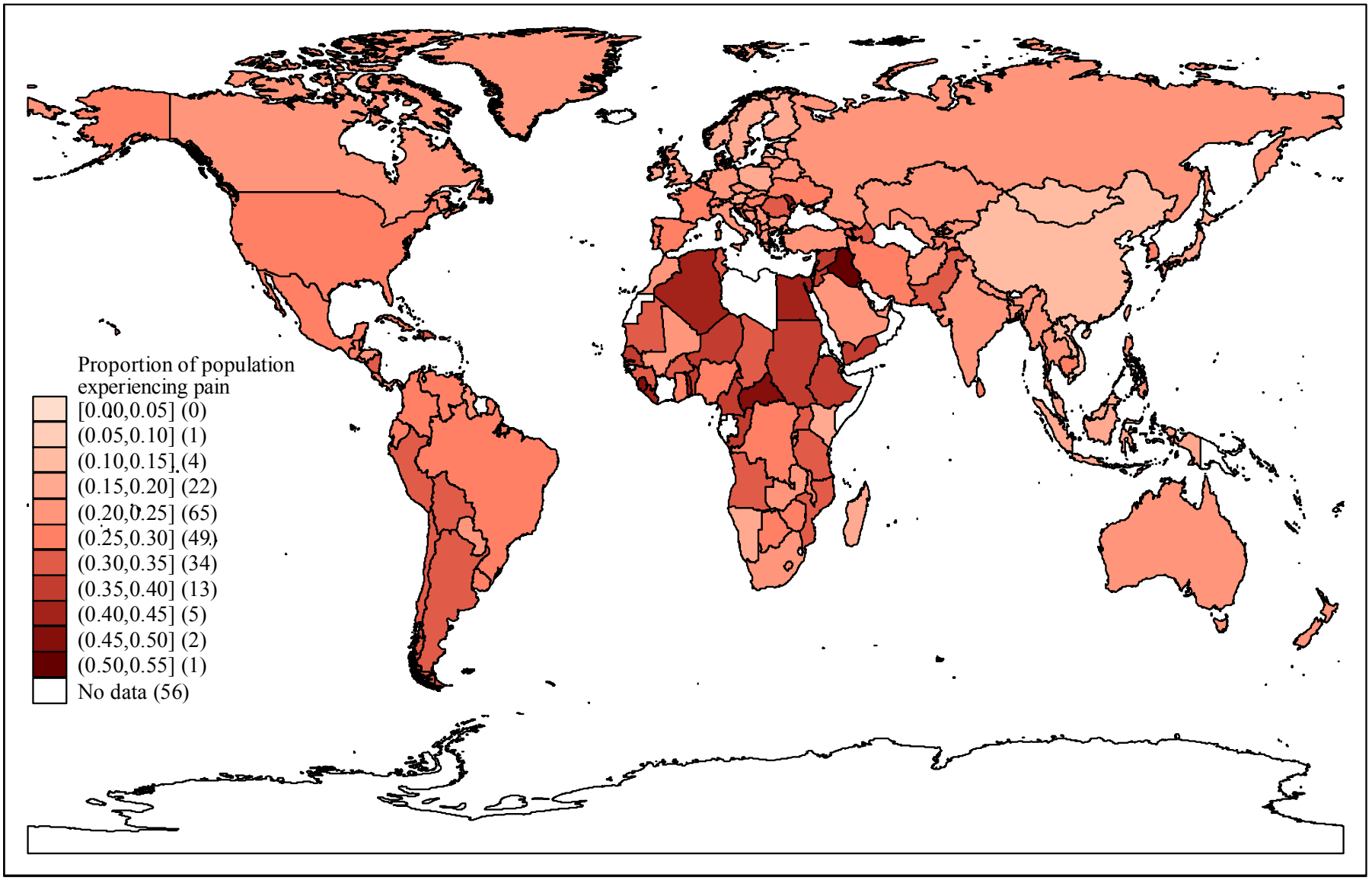

Did you learn or do something interesting yesterday?
Proportion agreeing
0.80
0.60
0.40
0.20
Real GDP per Capita at PPP ($000s, log scale)
.25
.5
1
2
4
8
16
32
64
Correlation = 0.01
VEN
NGA
NIC
GUY
SLV
GTM
ECU
PAN
CRI
NER
GIN
MRT
DJI
COL
TTO
NZL
MLI
SEN
NAM
KWT
CAN
SLE
LBR
KEN
SDN
AGO
MEX
NOR
USA
BRA
CHL
TZA
RWA
VNM
AFG
MOZ
UGA
MWI
COD
TCD
LAO
COG
EGY
ZAF
URY
BWA
BFA
HTI
ZWE
ETH
BIH
CZE
IDN
JOR
MKD
ITA
SGP
UZB
BEN
MDA
SYR
DZA
NLD
TGO
MAR
TWN
GRC
KOR
BDI
KHM
IND
MNG
ALB
BGR
HKG
MMR
MDG
NPL
GEO
BGD


Love
Proportion who experienced this feeling during a lot of the day yesterday
Real GDP per Capita at PPP ($000s, log scale)
1.00
0.80
0.60
0.40
0.20
.25
.5
1
2
4
8
16
32
64
Correlation = 0.19
RWA
KHM
PHL
PRY
GUY
TZA
NGA
LAO
VNM
MDG
GHA
KEN
ZWE
LBR
SLE
MOZ
BGD
HTI
BDI
COD
UGA
SDN
IND
PAK
NAM
IDN
AGO
ALB
THA
JOR
IRN
POL
HRV
SAU
CHL
CYP
TTO
HUN
USA
NOR
SVN
ISR
TWN
JPN
HKG
SGP
KOR
EST
LVA
RUS
UKR
AZE
KAZ
BLR
MAR
GEO
MDA
YEM
TJK
TCD
ETH
TGO
MMR
BEN
MRT
CMR
SEN
NPL
AFG
NER
KGZ
UZB
MNG
ARM



Source: Alan Krueger, Betsey Stevenson and Justin Wolfers, "A World of Pain".

Global Map of Pain



Did you experience the following feelings during a lot of the day yesterday? How about physical pain?

Source: Alan Krueger, Betsey Stevenson and Justin Wolfers, "A World of Pain".