

Governance Research Indicators Project

Governance Matters III: Indicators for 1996-2002

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***For data, full paper, further details, references and URLs see the
second-last slide, or visit: <http://www.worldbank.org/wbi/governance>***

Outline

- Definition and sources of Data on Governance
- Constructing Aggregate Indicators
- Interpreting i) Levels; ii) Changes; and iii) Global Trends in governance across countries:
- Uses and Limitations of Governance indicators
 1. Why *subjective* data?
 2. Margins of error for *objective indicators*?
 3. *Ideological biases* in expert assessments?
 4. Margins of error and *aid allocation rules*?
- Summary and implications for future work

Defining and Unbundling Governance

Governance: the traditions and institutions by which authority is exercised.

This includes:

- The process by which those in authority are selected and replaced (VOICE AND ACCOUNTABILITY;
POLITICAL STABILITY & ABSENCE OF VIOLENCE)
- The capacity of government to formulate and implement policies (GOVERNMENT EFFECTIVENESS;
REGULATORY QUALITY)
- The respect of citizens and state for institutions that govern interactions among them (RULE OF LAW,
CONTROL OF CORRUPTION)

Sources of Governance Data

- “Perceptions” data on governance from 25 different sources constructed by 18 different organizations
- Data sources include cross-country surveys of firms, commercial risk-rating agencies, think-tanks, government agencies, international organizations, etc.)
- Over 200 proxies for various dimensions of governance
- Organize these measures into six clusters corresponding to definition of governance, for four periods: 1996, 1998, 2000, and 2002, covering up to 199 countries

Sources of Governance Data

- Cross-Country Surveys of Firms: *Global Competitiveness Survey, World Business Environment Survey, World Competitiveness Yearbook, BEEPS*
- Cross-Country Surveys of Individuals: Gallup International, Latinobarometro, Afrobarometer
- Expert Assessments from Commercial Risk Rating Agencies: DRI, PRS, EIU, World Markets Online,
- Expert Assessments from NGOs, Think Tanks: Reporters Without Borders, Heritage Foundation, Freedom House, Amnesty International
- Expert Assessments from Governments, Multilaterals: World Bank CPIA, EBRD, State Dept. Human Rights Report

Inputs for Governance Indicators 2002

Publisher	Publication	Source	Country Coverage
•Wefa's DRI/McGraw-Hill	Country Risk Review	Poll	117 developed and developing
•Business Env. Risk Intelligence	BERI	Survey	50/115 developed and developing
•Columbia University	Columbia U. State Failure	Poll	84 developed and developing
•World Bank	Country Policy & Institution Assessment	Poll	136 developing
•Gallup International	Voice of the People	Survey	47 developed and developing
•Business Env. Risk Intelligence	BERI	Survey	50/115 developed and developing
•EBRD	Transition Report	Poll	27 transition economies
•Economist Intelligence Unit	Country Indicators	Poll	115 developed and developing
•Freedom House	Freedom in the World	Poll	192 developed and developing
•Freedom House	Nations in Transit	Poll	27 transition economies
•World Economic Forum/CID	Global Competitiveness	Survey	80 developed and developing
•Heritage Foundation	Economic Freedom Index	Poll	156 developed and developing
•Latino-barometro	LBO	Survey	17 developing
•Political Risk Services	International Country Risk Guide	Poll	140 developed and developing
•Reporters Without Borders Reporters sans frontieres (RSF)		Survey	138 developed and developing
•World Bank/EBRD	BEEPS	Survey	27 transition economies
•IMD, Lausanne	World Competitiveness Yearbook	Survey	49 developed and developing
•Binghamton Univ.	Human Rights Violations Research	Survey	140 developed and developing

Ingredients for Rule of Law Indicator

Surveys of Firms

BEEPS

Global Competitiveness Survey

World Competitiveness Yearbook

Type of Questions

Courts Honest? Crime? Property rights protected?

Crime, money laundering, judicial independence, protection of financial assets

Justice fairly administered, personal security and private property protected

Surveys of Individuals

Gallup

Trust in legal system

Risk Rating Agencies

BERI

DRI

EIU

PRS

World Markets Observer

Contract enforcement

Costs of crime, enforceability of contracts

Costs of crime, enforceability of contracts, property rights protection

Law and order

Judicial independence, crime

Think Tanks

Freedom House

Heritage Foundation

Rule of law

Property rights, black market activity

Governments

State Dept Human Rights Report

Judicial independence

Building Aggregate Governance Indicators

- Use Unobserved Components Model (UCM) to construct composite governance indicators, and margins of error for each country
- Estimate of governance: *weighted average* of observed scores for each country, re-scaled to common units
- Weights are proportional to *precision* of underlying data sources
- Precision depends on how strongly individual sources are correlated with each other
- Margins of error reflect (a) *number of sources* in which a country appears, and (b) the *precision of those sources*

Unobserved Components Model

- Observed indicator k of governance in country j , $y(j,k)$, is noisy indicator of true governance in country j , $g(j)$:

$$y(j,k) = \alpha(k) + \beta(k) \cdot (g(j) + \varepsilon(j,k))$$

- Variance in measurement errors is same across countries for each source, but different across sources:

$$E[\varepsilon(j,k)^2] = \sigma_{\varepsilon}^2(k)$$

- *Identifying assumption:* Measurement errors are uncorrelated across sources ? highly correlated sources measure governance with more precision

Estimates of Governance from UCM

- UCM allows us to infer the distribution of governance in a country conditional on the observed data for that country
- Best estimate of governance is the *mean* of this conditional distribution:

$$E[g(j) \mid y(j,1), \dots, y(j, K(j))] = \sum_{k=1}^{K(j)} w(k) \cdot \frac{y(j,k) - \alpha(k)}{\beta(k)}$$

- So estimate of governance is *weighted average of re-scaled scores*, with weights proportional to precision of each source:

$$w(k) = \frac{\sigma_{\varepsilon}(k)^{-2}}{1 + \sum_{k=1}^{K(j)} \sigma_{\varepsilon}(k)^{-2}}$$

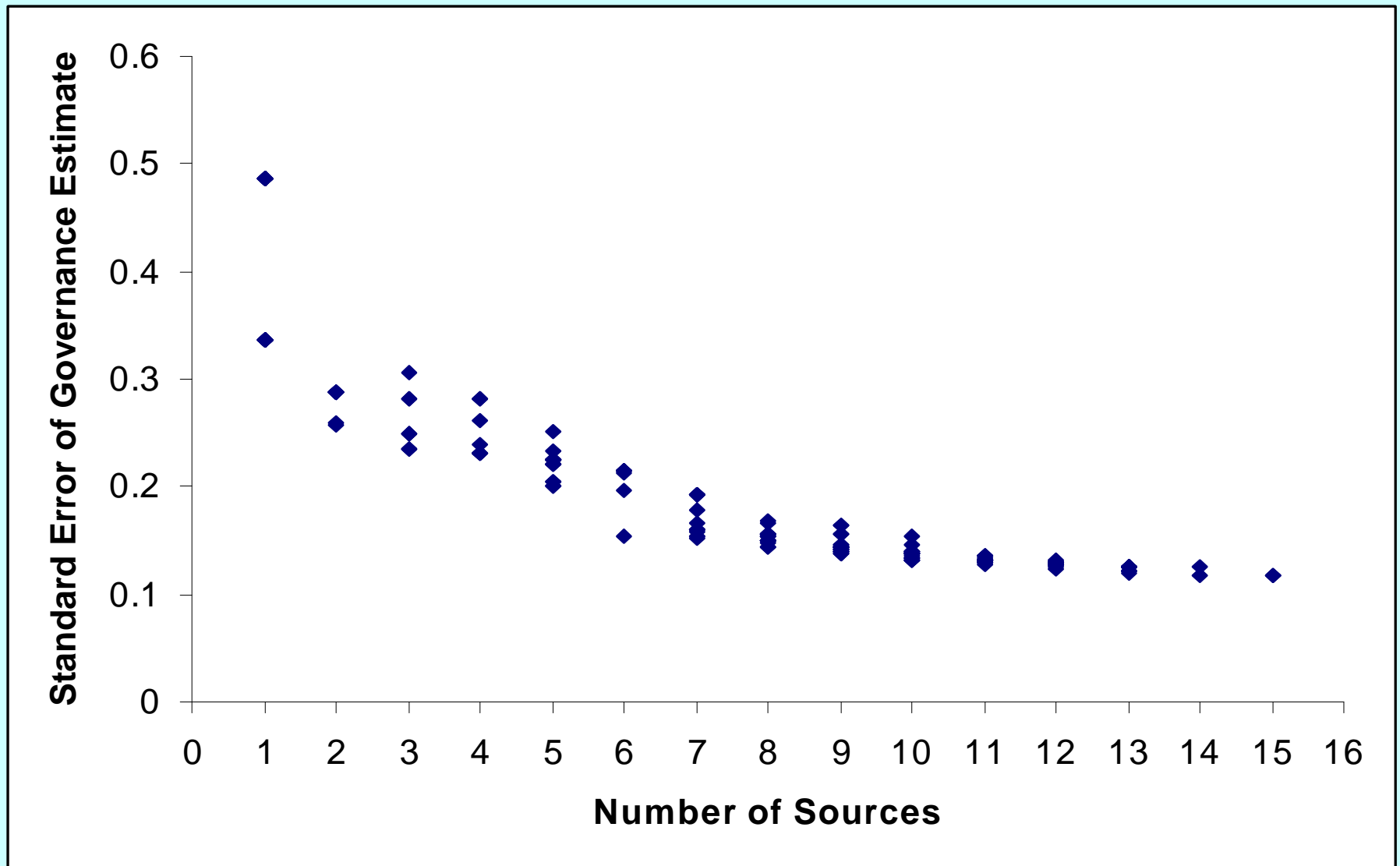
Precision of Estimates from UCM

- Reliability or precision of estimate of governance for each country is the standard deviation of this conditional distribution:

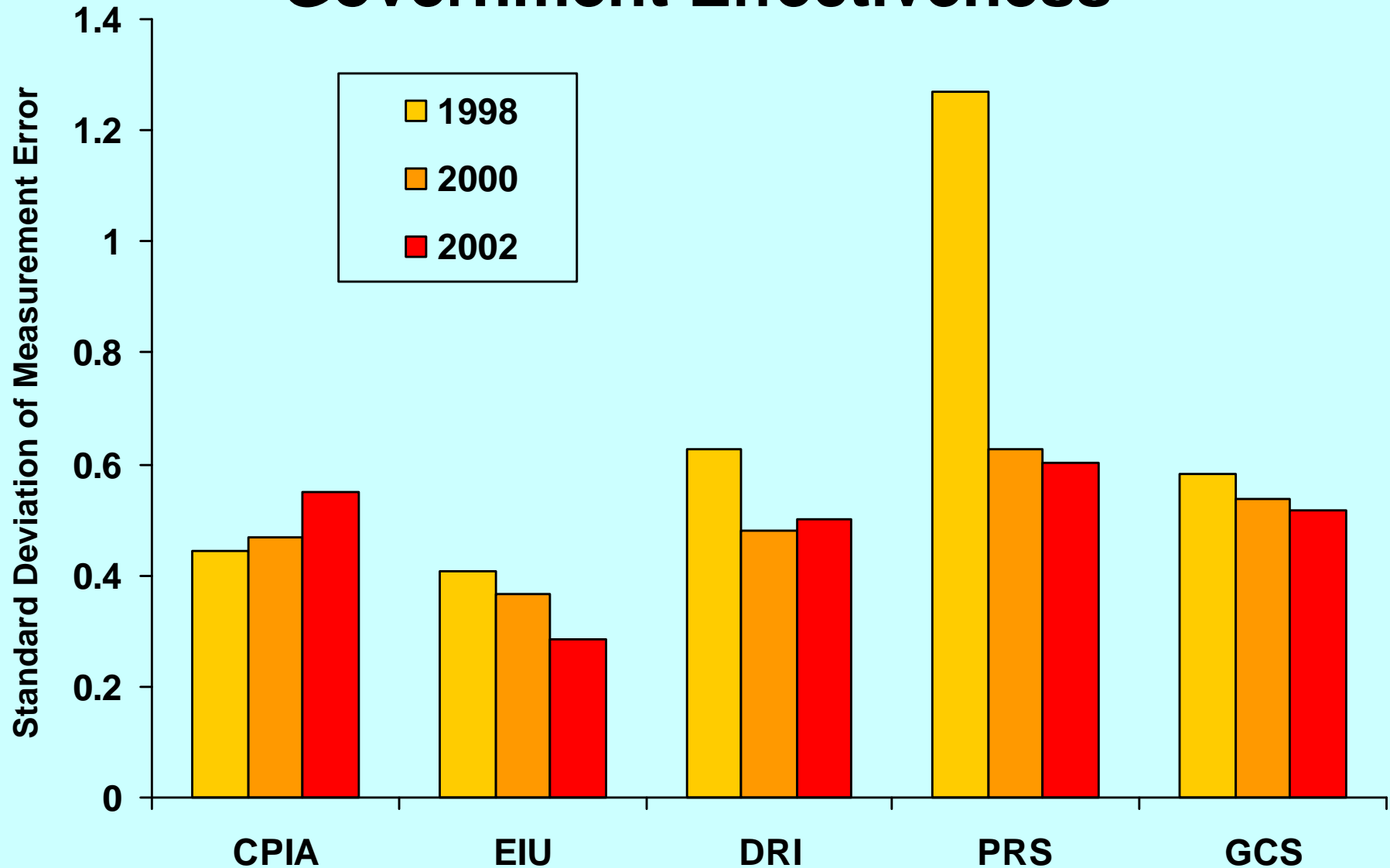
$$SD[g(j) | y(j,1), \dots, y(j, K(j))] = \left(1 + \sum_{k=1}^{K(j)} \sigma_{\varepsilon}(k)^{-2} \right)^{-\frac{1}{2}}$$

- These standard errors are smaller for countries that (a) appear in *more* sources, and/or (b) appear in *more reliable* sources

Precision and Number of Sources: Rule of Law Indicator, 2002



Measurement Error of Individual Sources: Government Effectiveness

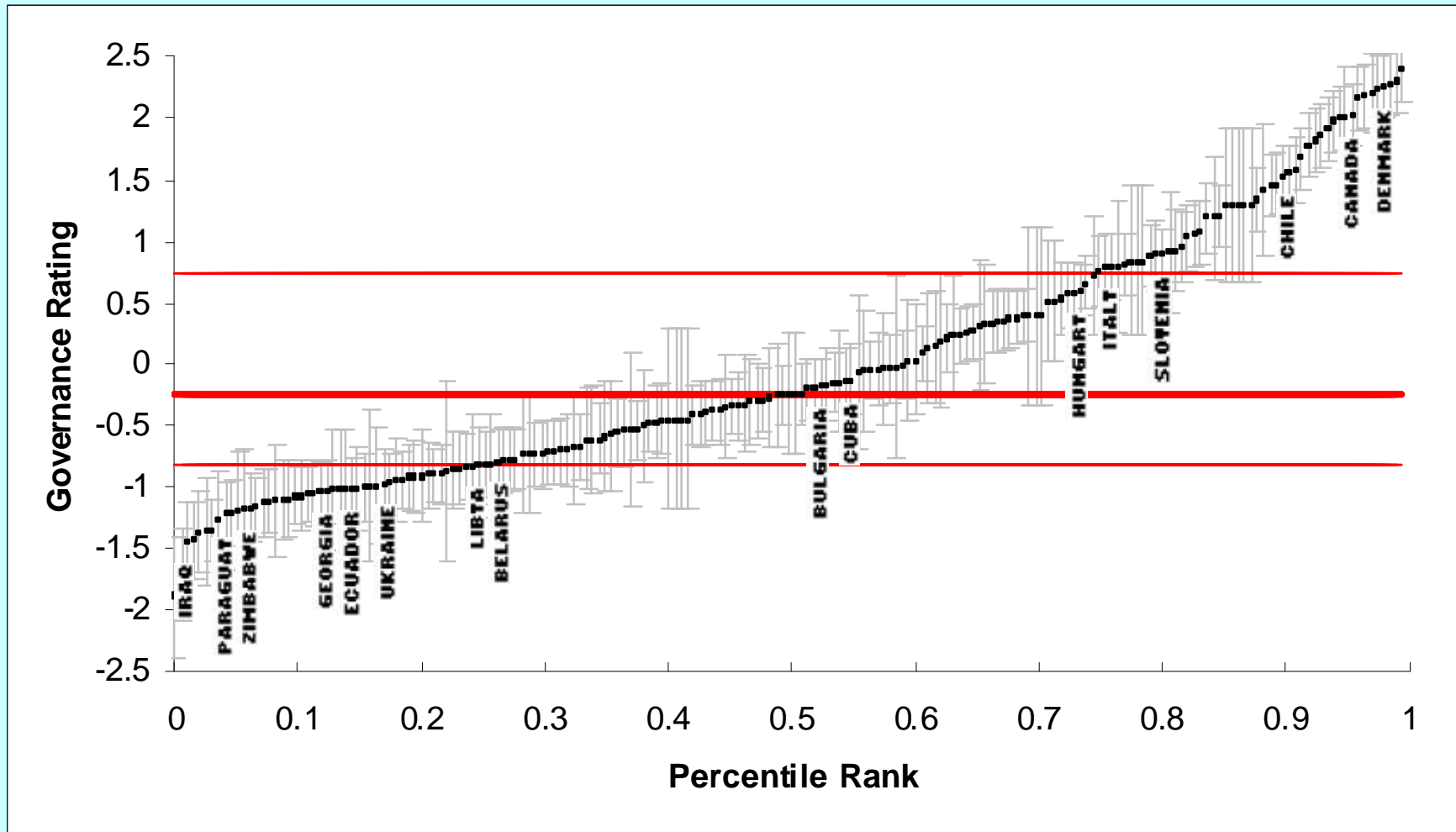


Note: Selected sources, 3 periods. Illustrates margins of error of individual sources.

Estimating the Unobserved Components Model

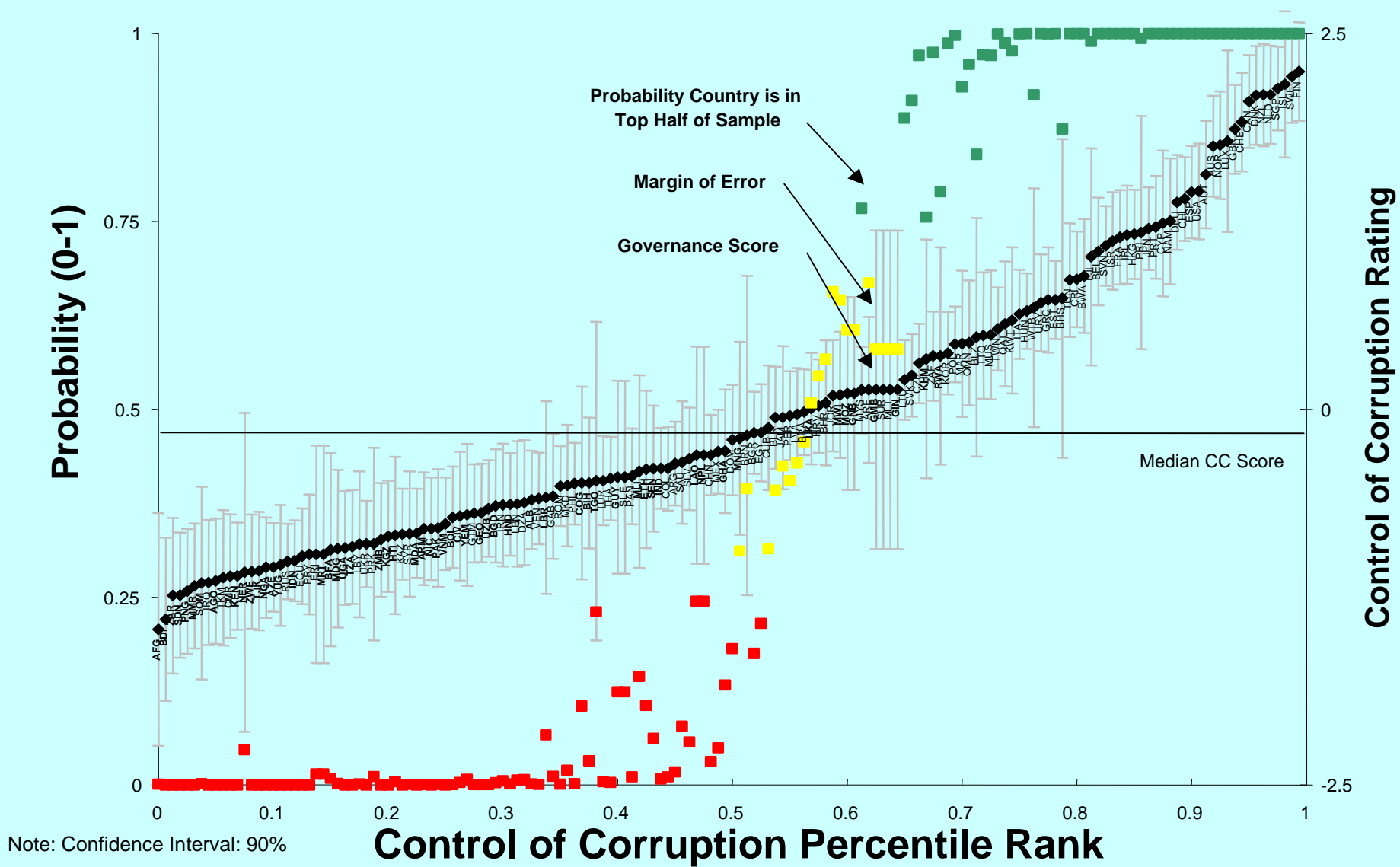
- Distinguish between *representative* and *non-representative sources*
- For representative sources, estimate parameters $\alpha(k)$, $\beta(k)$, and $\sigma_\varepsilon(k)$ using maximum likelihood
- Construct initial estimate of governance using representative sources only
- For non-representative sources, estimate parameters by regressing each source on initial estimate of governance
- Construct final estimate of governance using all sources

Levels of Corruption Across Countries, 2002



Note: This graph shows estimates of the indicated dimension of governance (on the vertical axis) for all countries graphed against each country's percentile rank (on the horizontal axis) for 2002. The vertical bars show the statistically-likely range of values of governance for each country, with the midpoint of each bar corresponding to the best single estimate. Selected countries are labeled. As emphasized in the text, the ranking of countries along the horizontal axis is subject to significant margins of error, and this ordering in no way reflects the official view of the World Bank, its Executive Directors, or the countries they represent.

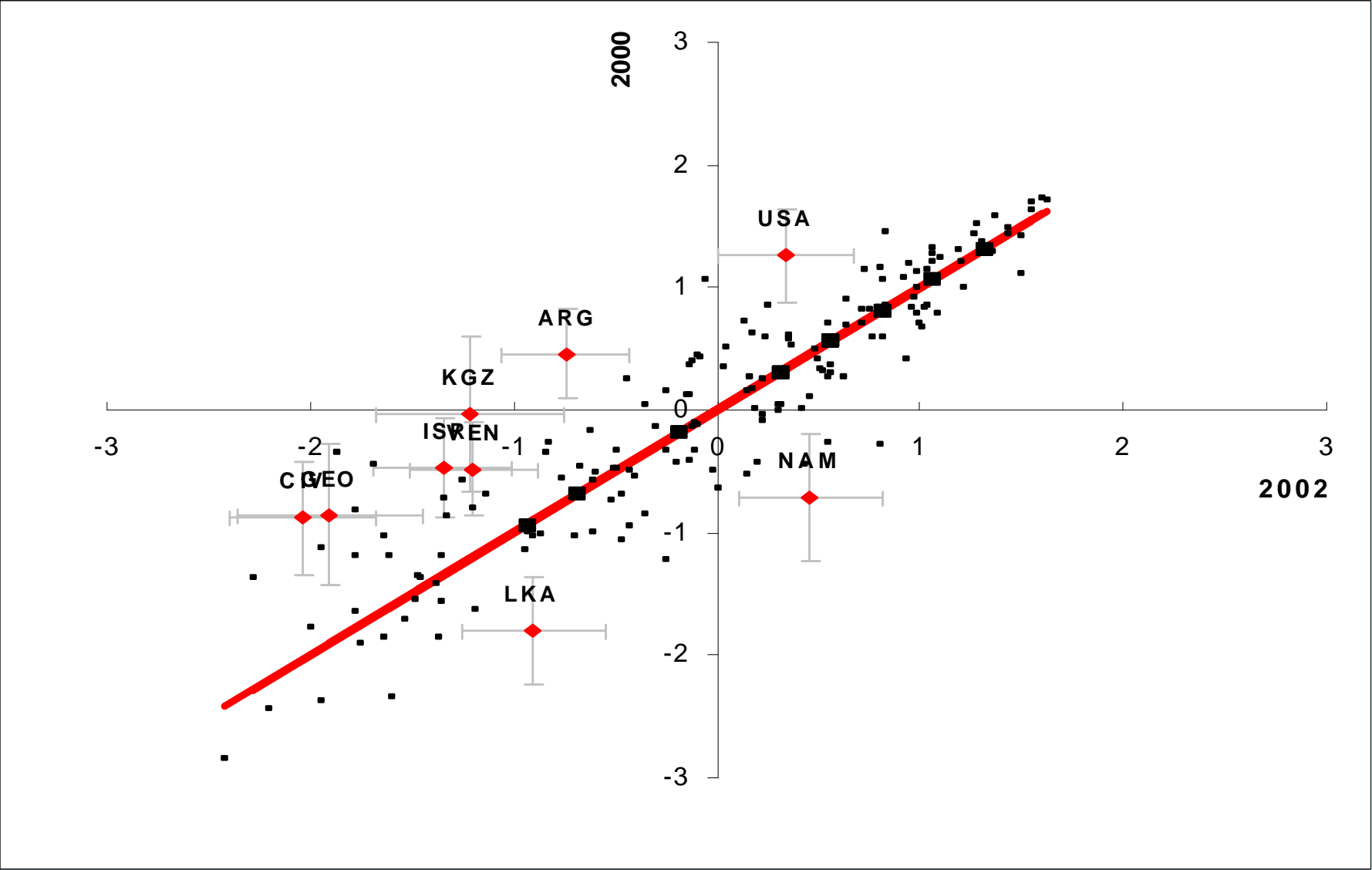
Assigning Countries to Governance Categories: Margins of Error Matter



Interpreting Cross-Country Differences in Governance

- Governance scores are normally distributed; they run from about -2.5 to 2.5 (*i.e. denominated in S.D. units*)
- Global average is zero for all indicators and periods- so indicators measure countries' *relative* positions
- Margins of error are substantial:
 - Small differences in estimates in governance unlikely to be statistically significant
 - Relatively few countries have 90% confidence intervals entirely within a single quartile
- More countries do have confidence intervals entirely within their half, and even within their tercile
- Differences in governance between best and worst group of countries in the world are unambiguous

Changes Over Time in Political Stability and Absence of Violence 2000-2002



Interpreting Changes over Time

Changes over time in a country's score reflect:

- Changes in scores on underlying sources: *best indication of underlying changes in governance*
- Changes in weights assigned to sources: *re-weighting improves precision of levels, in practice has little effect on changes*
- Changes in the set of sources the country appears in: *so changes in governance estimates may simply reflect additional information rather than changes on the ground, in practice this can matter a lot*
- Changes in the set of countries covered: *since indicator measures only relative positions, adding "good" or "bad" countries can affect all scores, in practice this has little effect on changes*

Significance of Changes over Time

- No formal tests of statistical significance (need information on *joint* distribution of governance in two periods)
- Informally focus on “large” changes where 90% confidence intervals in two periods don’t overlap
- Relatively few “large” changes – but for most of these cases, most underlying sources agree about the direction of change
- Most changes over short period are “small”; often lack of consensus among individual sources about direction of change

Observed changes in governance estimates, especially over very short periods, should be interpreted very cautiously

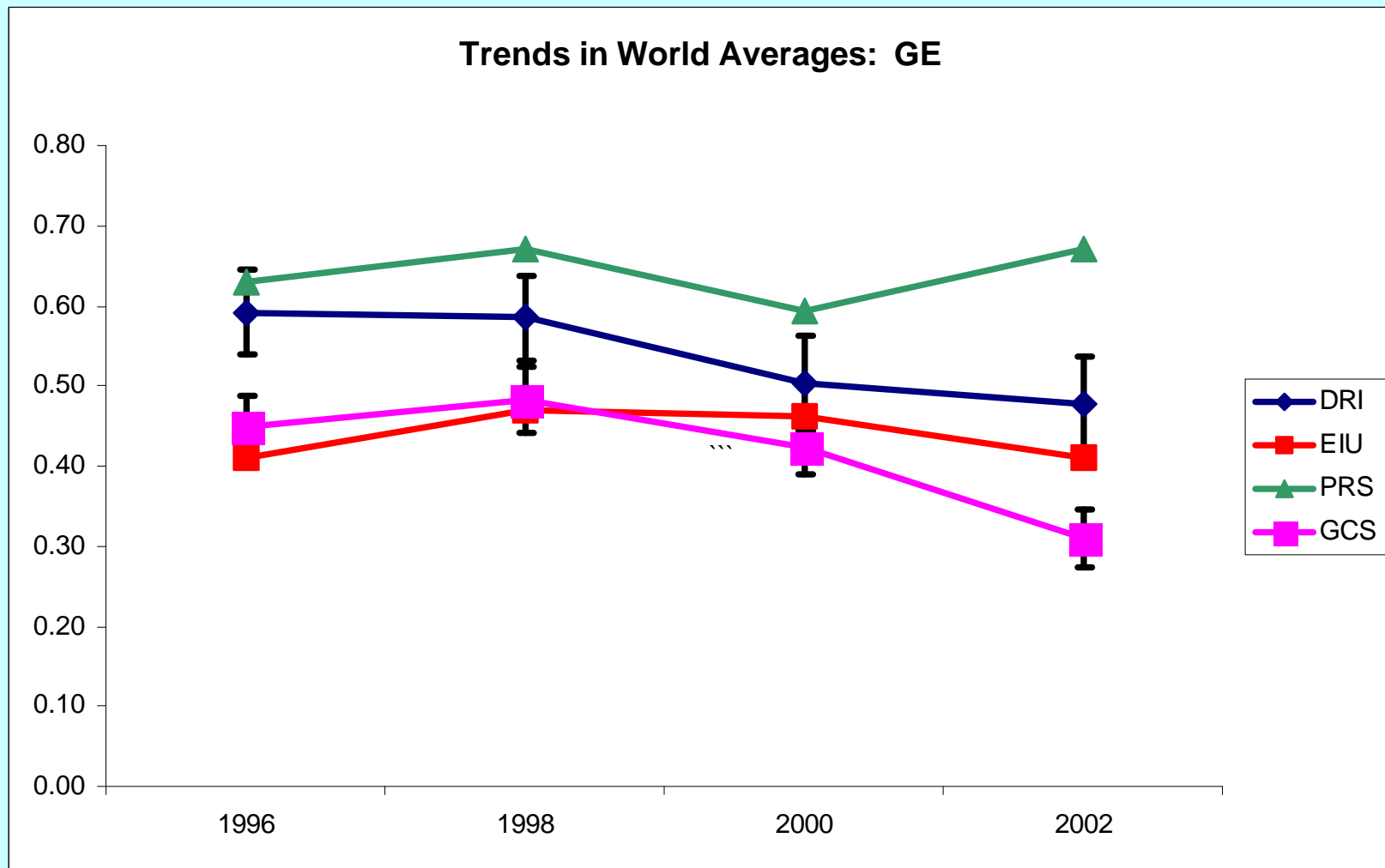
Agreement Among Sources About Direction of Changes in Governance 2000-2002, All Changes

	<u>Agree</u>	<u>No Change</u>	<u>Disagree</u>	<u>Agree/(Agree+Disagree)</u>
Voice and Accountability	2.10	0.59	1.27	0.64
Political Stability	2.83	0.30	1.58	0.66
Government Effectiveness	2.26	0.42	1.55	0.62
Regulatory Quality	2.00	0.22	1.47	0.57
Rule of Law	2.58	2.30	1.63	0.62
Control of Corruption	1.96	1.75	1.32	0.62
Average	2.29	0.93	1.47	0.62
Average for Large Changes	3.11	0.78	0.81	0.79

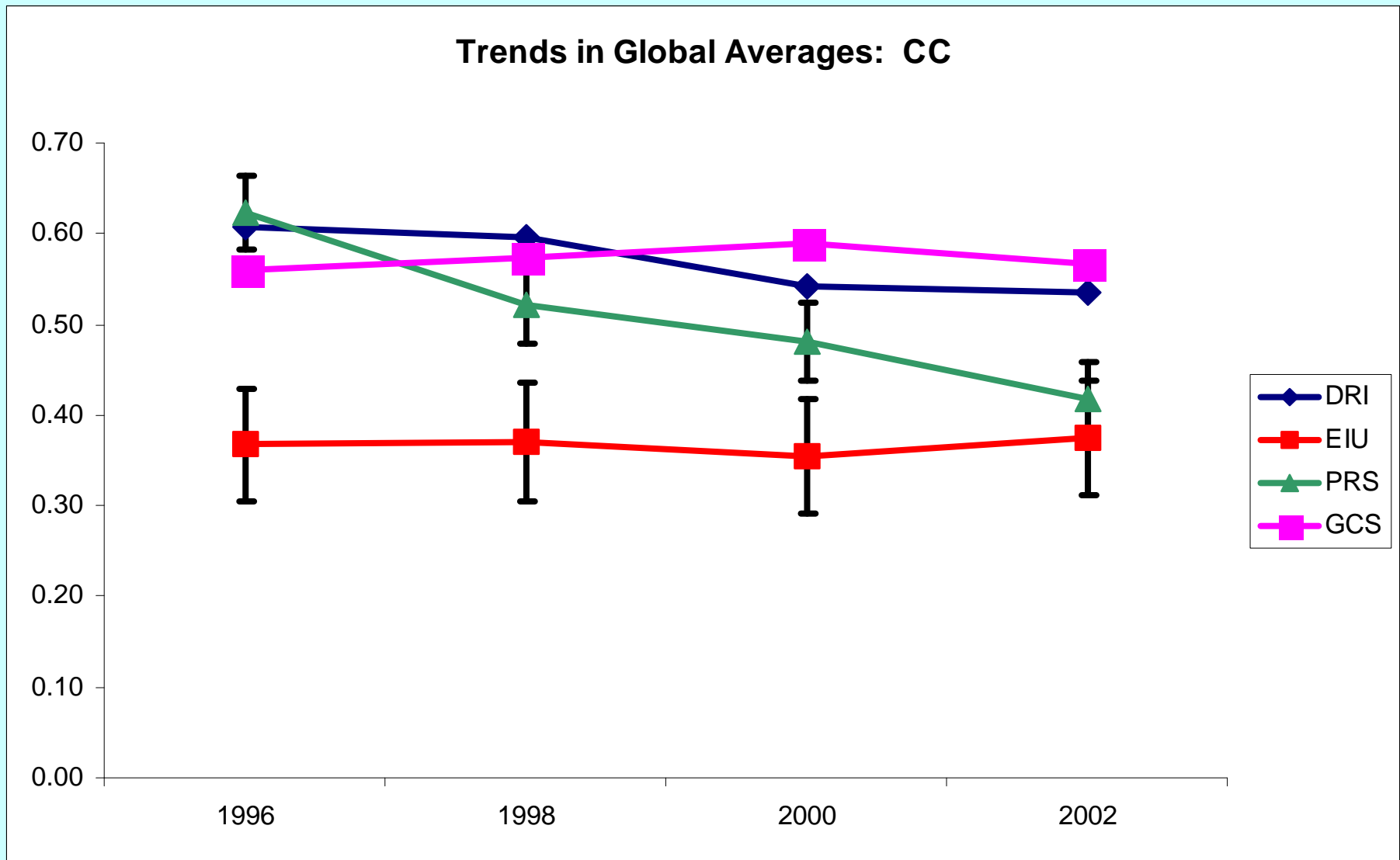
Global Trends in Governance

- Governance indicators have mean zero in each period – measure only the *relative* position of countries or groups of countries
- What can we say about trends in governance for world as a whole? Need to look at individual sources with good time series coverage.
- Look at world average of scores on PRS, DRI, EIU for balanced set of 100+ countries, and on GCS for balanced set of 54 countries

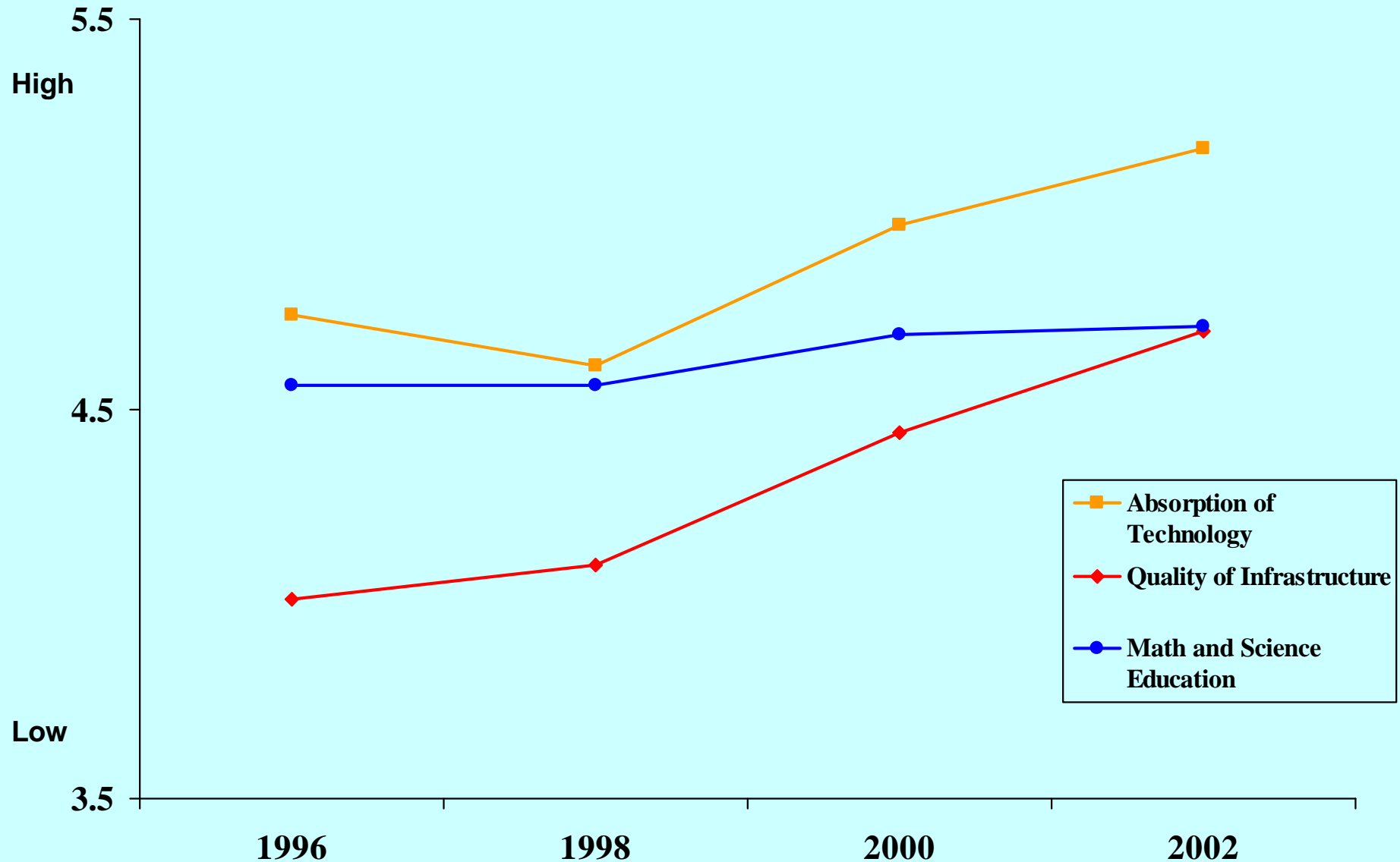
Trends in Global Averages: Government Effectiveness



Trends in Global Averages: Control of Corruption



Trends in Global Averages in other dimensions



Source: Global Competitiveness Survey, WEF. Balanced Sample. 1996 data drawn from GCS, 1997. Data for Absorption of Technology for 2000 drawn from GCS 1999 due to missing question in 2000.

Summary of Global Trends in Governance

- At first glance, picture appears mixed: 8 averages increase, 11 decrease.

But...

- Some trends do appear to be statistically significant:
 - 2 significant increases (*in RQ*)
 - 10 significant decreases (*in CC, RL, PV, GE, RQ*)
- No evidence of systematic improvements in governance worldwide over the (*admittedly short*) 1996-2002 period
- This contrasts some other dimensions (e.g. infrastructure, technology, and science education): the same firms report progress over the period, thus differentiating performance.

So...

- Deterioration in governance performance of an individual country on the relative governance indicators cannot be due to the rest of the world improving

Why Subjective Governance Data?

- For some dimensions (e.g. corruption), no cross-country objective data exist
- Limited quantitative measures of corruption focus differences in procurement costs relative to materials purchased
- Subjective data can pick up crucial distinction between *de jure* and *de facto* institutional arrangements – most countries in the world have elections, anti-corruption commissions, and decent anticorruption laws in the books
- Perceptions do matter

Margins of Error Are Not Unique to Subjective Indicators

Many potential objective/quantitative indicators of governance:

- Regulatory Quality: *Days to start a business*
- Rule of Law: *Contract-intensive money (share of M2 held in banking system, confidence in property rights protection)*
- Government Effectiveness: *Stability of budgetary revenue and expenditure shares (policy instability), share of trade taxes in revenue (narrow tax base)*

Like all indicators, they are imperfect proxies for broader notions of governance – and so have implicit margins of error relative to these broader concepts

Inferring Margins of Error for Objective Indicators

- Assume that subjective and objective indicators both provide noisy signals of broad concept of governance:

$$\text{Subjective } j = g_j + \varepsilon_{1j}$$

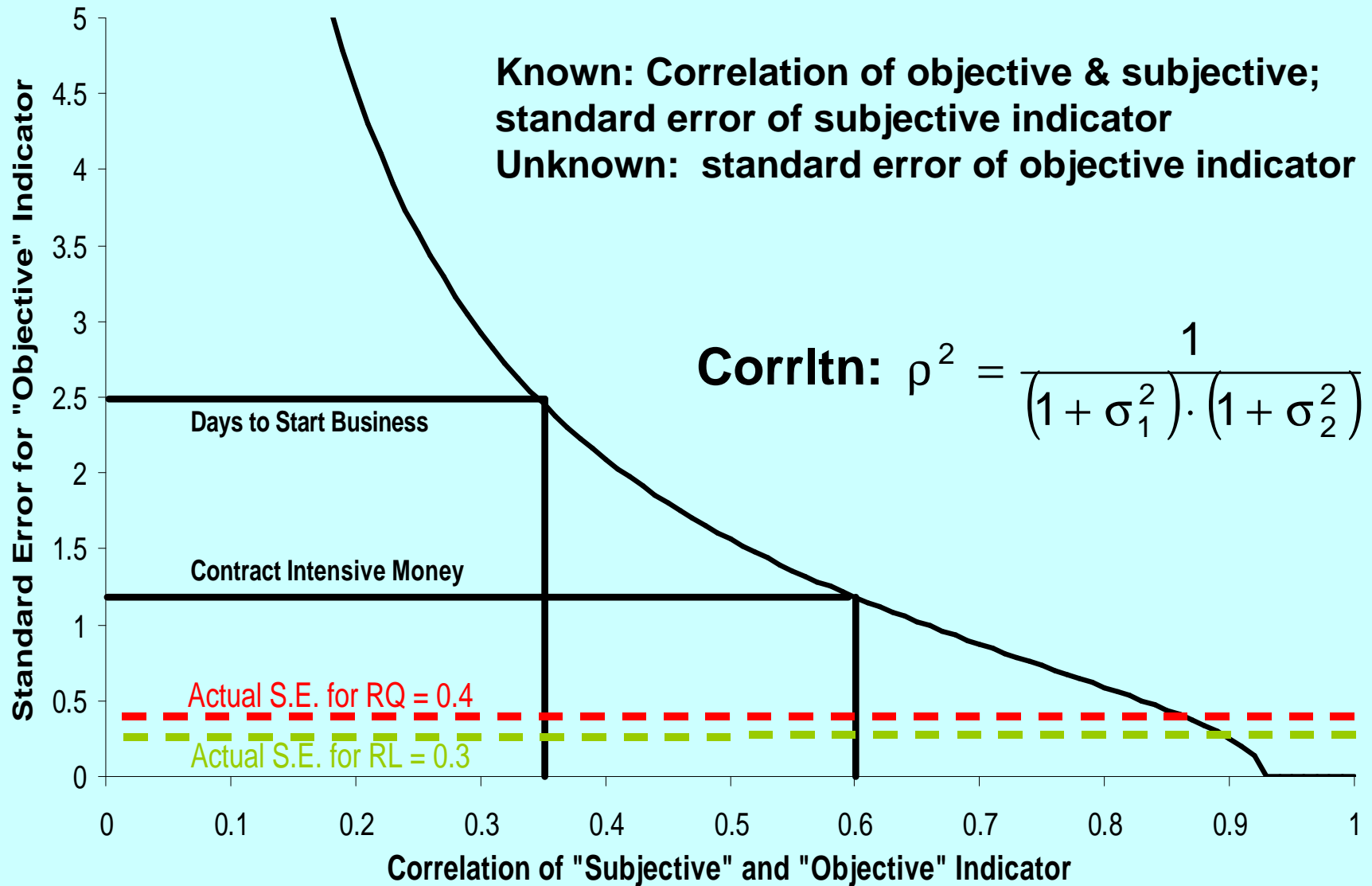
$$\text{Objective } j = g_j + \varepsilon_{2j}$$

- Observed correlation between indicators depends only on variance of measurement error of two sources:

$$\rho = \left(\left(1 + \sigma_1^2 \right) \cdot \left(1 + \sigma_2^2 \right) \right)^{-1/2}$$

- Since we have estimate of variance of measurement error in subjective indicator, we can infer variance of measurement error in objective indicator

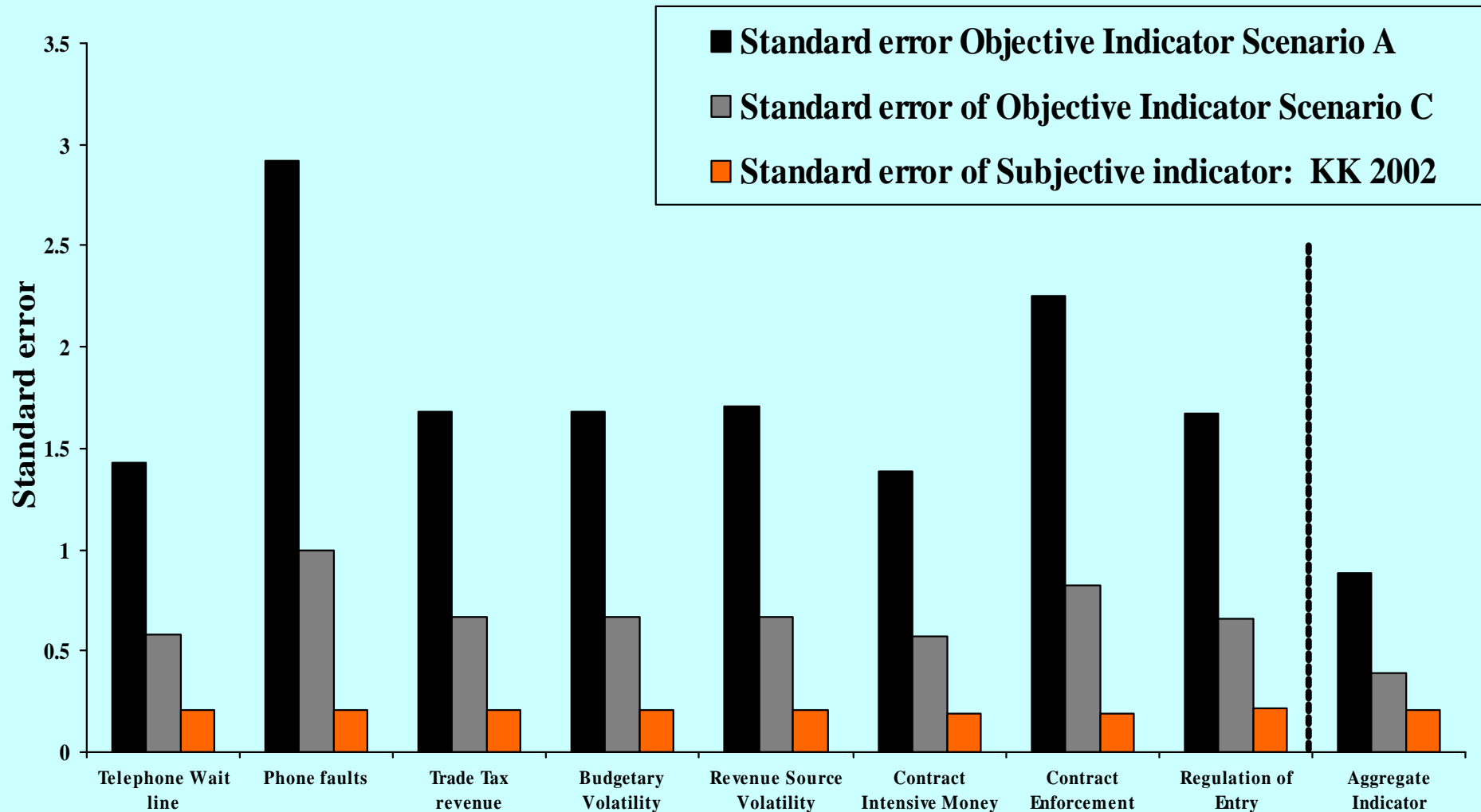
Measurement Error for Objective Indicators



Margins of Error for Objective Indicators

<u>Objective Indicator</u>	<u>Absolute Value of Correlation</u>	<u>Implied Margin of Error for Objective Indicator</u>			<u>Actual Margin of Error for Subjective Indicator</u>
		<u>(A)</u>	<u>(B)</u>	<u>(C)</u>	
Telephone Wait Time	0.56	1.43	0.88	0.58	0.21
Phone Faults	0.32	2.92	1.47	1.00	0.21
Trade Tax Revenue	0.50	1.68	1.00	0.67	0.21
Budgetary Volatility	0.50	1.68	1.00	0.67	0.21
Revenue Source Volatility	0.49	1.71	1.01	0.67	0.21
Contract Intensive Money	0.57	1.39	0.86	0.57	0.19
Contract Enforcement	0.40	2.25	1.22	0.82	0.19
Regulation of Entry	0.50	1.67	1.00	0.66	0.22
Aggregate Objective Indicator	0.73	0.88	0.60	0.39	0.21

Large Margins of Error for Objective Governance Indicators



Option A: estimate of standard deviation of measurement error in subjective indicator is correct. Option C: standard deviation of measurement error in subjective indicator is twice as large as that in the objective indicator. The standard error of subjective indicator refers to the Governance component closely related to the associated objective indicator

Do Expert Poll Assessments Reflect Ideological Biases of Rating Institutions?

- We subject this “popular” critique to empirical scrutiny
- Look at *difference* between (i) country rankings based on expert assessments (potentially prone to ideological biases), and (ii) country rankings based on firm surveys (not prone to biases)
- Regress this difference in assessments on a variable measuring ideology of government in power:
IDEOLOGY = 1 (Left-Wing), =2 (Center), =3 (Right-Wing)

Results of Ideology Regressions: Rule of Law 2002

	PRS	PIA	EIU	DRI	CDU	BRI	QLM	HUM	HER
Ideology	1.52	3.39	5.61	5.67	4.68	7.32	6.47	5.32	7.42
t-stat	0.41	0.73	1.65	1.46	1.21	1.65	1.63	1.19	1.91*
n	52	47	51	46	42	25	49	56	56
Adj R-Sq	-0.02	-0.01	0.03	0.02	0.01	0.05	0.03	0.01	0.05

- Positive estimates mean source rates right-wing governments higher than corresponding survey
- Little evidence of significant ideological biases
- Only Heritage tends to rate right-wing governments higher, magnitude of difference is small (less than ten percentile rank points)
- No overall difference between polls & surveys

Margins of Error and Aid Allocation

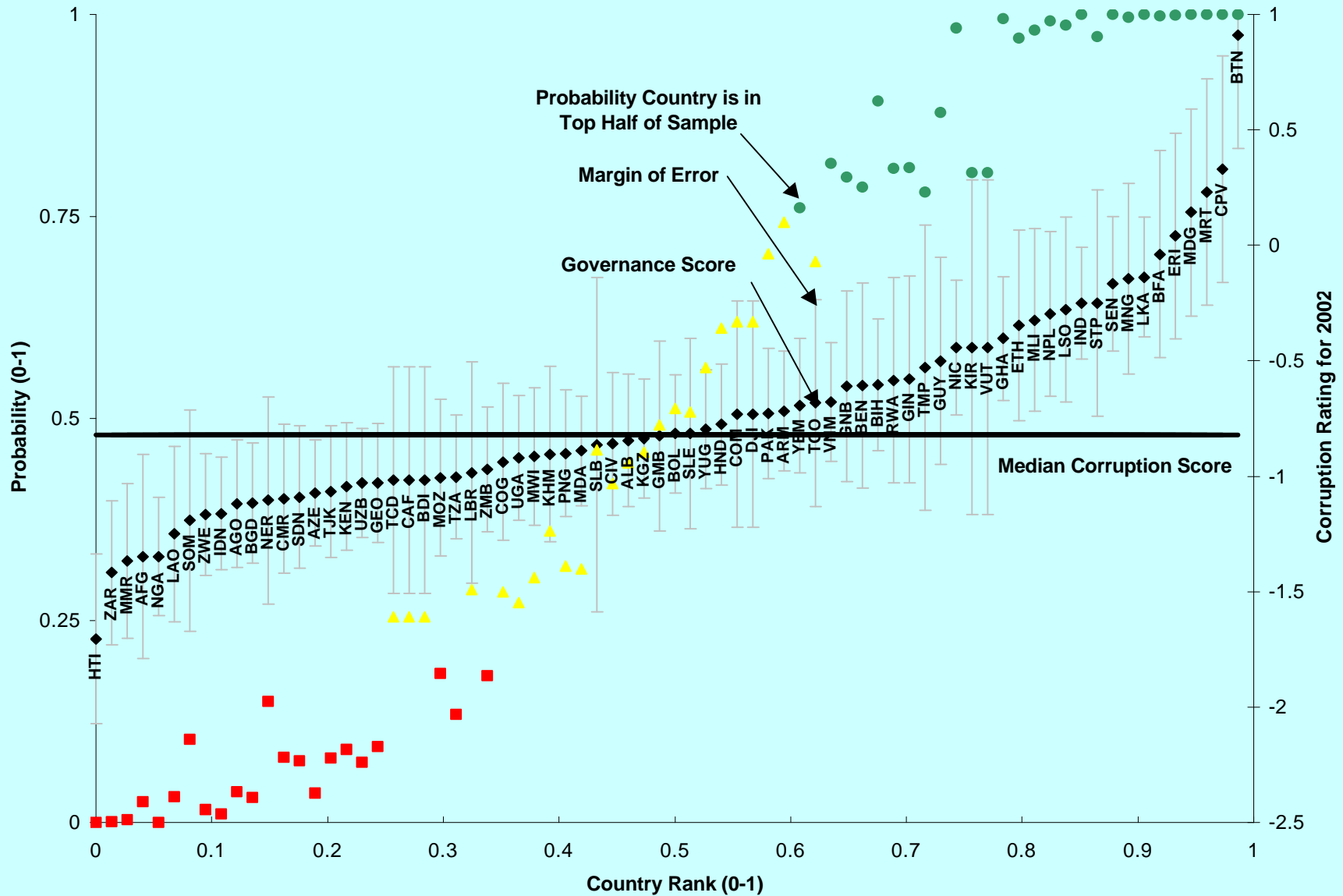
Example of U.S. Millennium Challenge Account

To be eligible for MCA funds, potentially-eligible IDA countries with per capita GDP less than \$1435 must score above median in half the indicators in three categories:

- Ruling Justly: Six indicators, including Voice, Government Effectiveness, Rule of Law, Control of Corruption
- Investing in People: Four indicators covering health and education spending and outcomes
- Promoting Economic Freedom: Six economic policy indicators including Regulatory Quality

and must score above median on Control of Corruption

Margins of Error and MCA



Margins of Error and the MCA

- Targeting aid towards countries with good institutions and policies makes sense
- Transparent publicly-available eligibility criteria encourages monitoring, accountability, progress

at the same time...

- Have to consider margins of error, especially with “hard” in-or-out rules like corruption hurdle: focus on ‘yellow light’ group just below the median
- Gather more information, country diagnostics, etc.
- Aggregate indicators advantage on margins of error
- Margins of error a major challenge for all other indicators as well -- which also need to address issue of country coverage gaps and timeliness

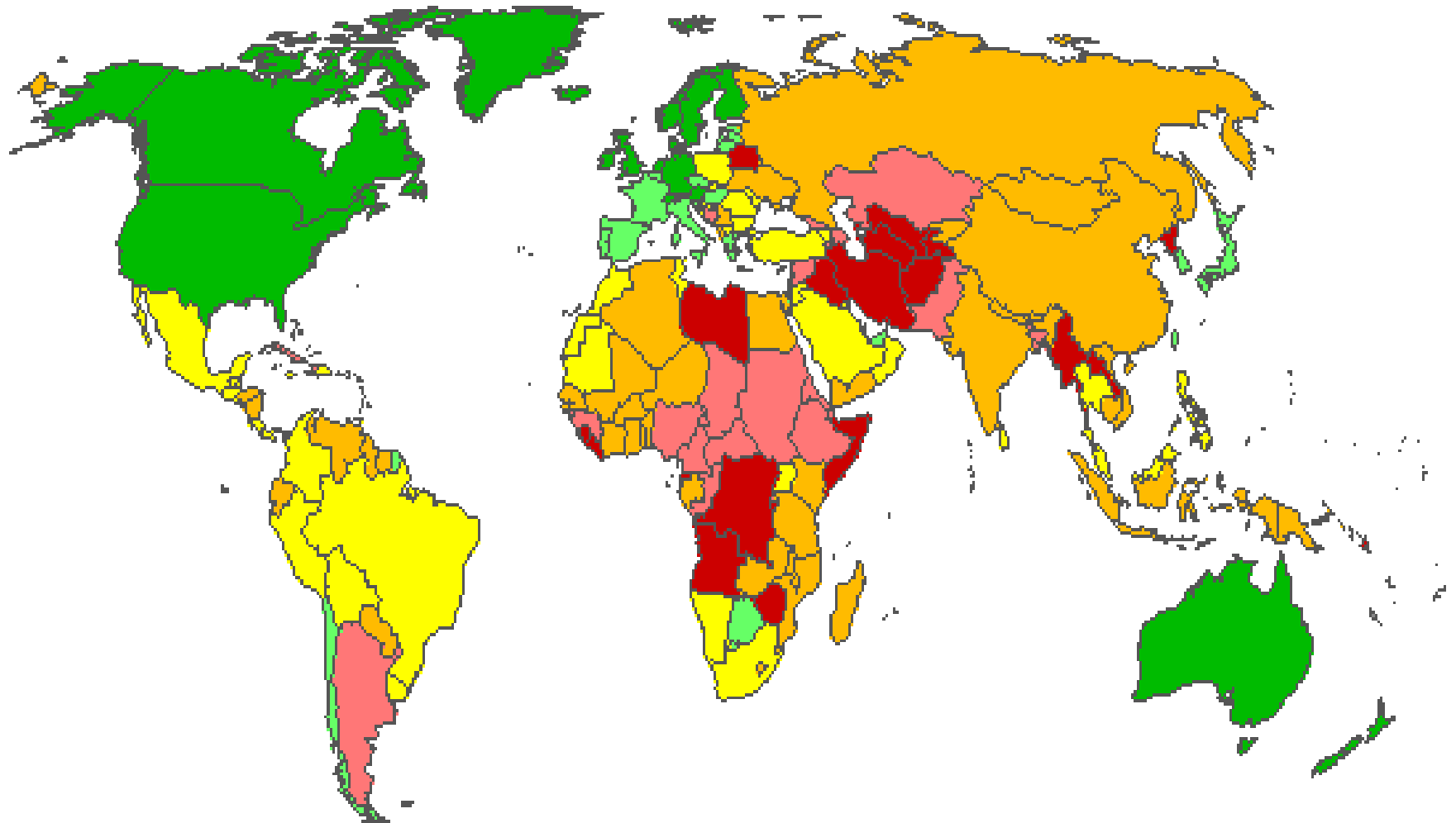
Recommendations for MCA Eligibility Rules

- Important to take margins of error seriously (for all indicators) – non-trivial risk of misclassifying countries
- Using multiple indicators reduces misclassification risk, but it remains substantial for “hard” corruption hurdle – *towards softening such ‘hard’ rule*
- Rely on additional sources of data, especially for borderline cases just above or below the cutoff – *complement with diagnostics*
- Measuring progress over time is difficult but important
- Maximizing country coverage for all indicators is key

Summary and Conclusions

- Six dimensions of governance, covering 199 countries for 1996, 1998, 2000, and 2002 -- data from 25 sources
- Data is informative, but margins of error, explicitly measured, need to be taken seriously
- Are there *global trends* in governance? – *Not improving*
- Methodological issues in construction/use of indicators:
 1. Why subjective data?: *Availability, Coverage, and it Matters*
 2. Margins of error for objective indicators: *Significant*
 3. Ideological biases in expert assessments? – *Not really*
 4. Margins of error w/r aid allocation rules: *Take seriously*
 5. Relative measures penalize *absolute* improvements?: *No*
- Aggregate cross-country indicators do inform, but are a blunt tool: Specific policies/strategies should also be informed by complementary in-depth country-specific diagnostics

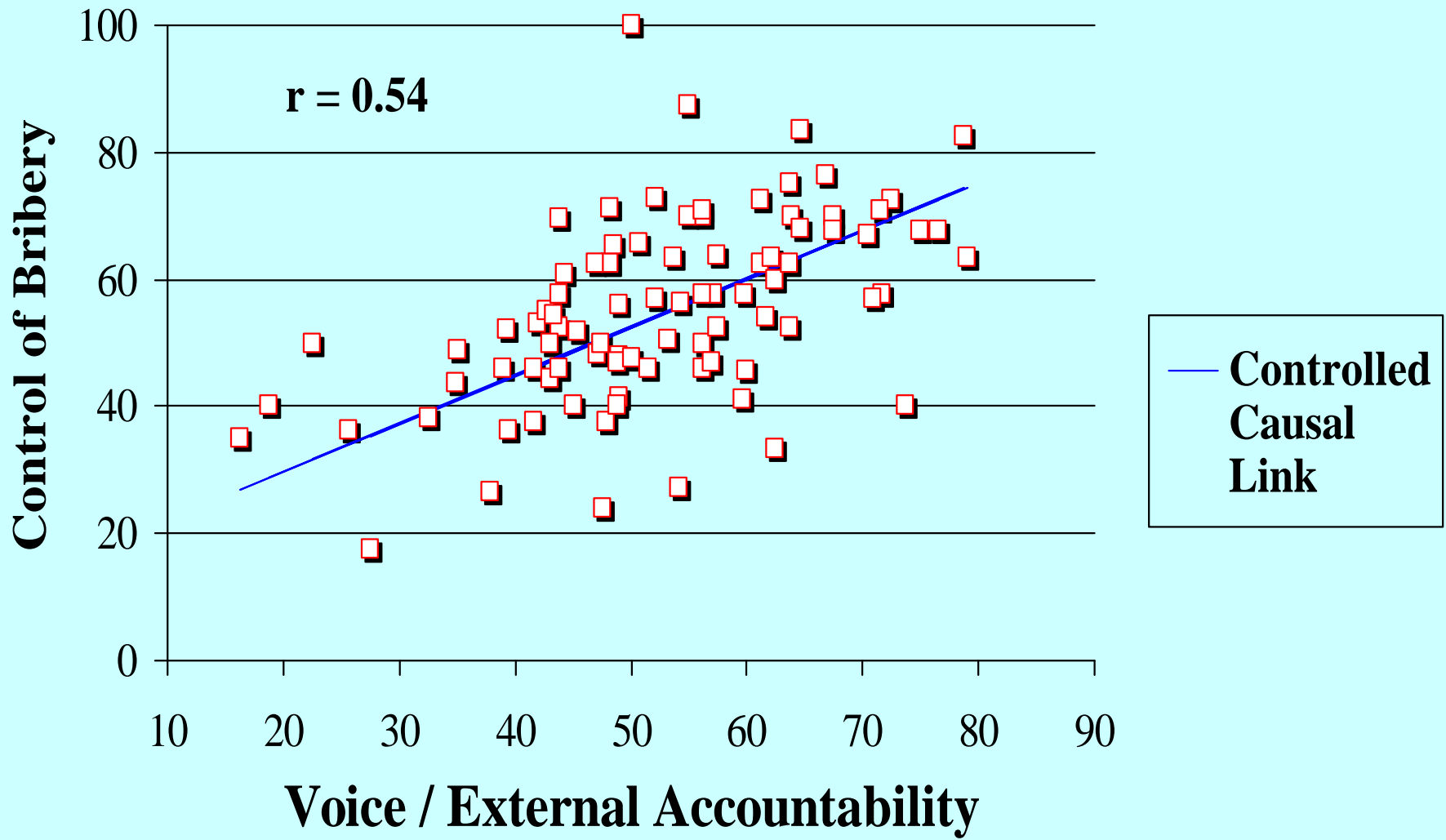
Governance World Map: Regulatory Quality 2002



This is an illustrative world map. Source for data: <http://www.worldbank.org/wbi/governance/govdata2002>; Map downloaded from: <http://info.worldbank.org/governance/kkz2002/govmap.asp>

Colors are assigned according to the following criteria, according to percentile rank: Light Red, bottom 25th percentile (bottom 10% in Dark Red); Orange, between 25% and 50%; Yellow, between 50% and 75%; Light Green between 75% and 90%; Dark Green above 90%. Caution applies due to margins of error.

External Accountability/Feedback Mechanisms Help Control Bribery (Bolivia in-depth country diagnostic)



Based on Public Officials Survey from Bolivia diagnostic. Separate project, this is to illustrate importance of complementing worldwide indicators with in-depth country diagnostics. Each dot reflects rating of a public institutions in Bolivia.

References and Links to full papers and further materials

- Governance Matters III:
<http://www.worldbank.org/wbi/governance/pubs/govmatters3.html>
- Governance Matters:
<http://www.worldbank.org/wbi/governance/pubs/govmatters.html>
- Aggregating Gov Indicators:
<http://www.worldbank.org/wbi/governance/pubs/aggindicators.html>
- Growth without Governance:
<http://www.worldbank.org/wbi/governance/pubs/growthgov.html>
- Governance Indicators Dataset:
<http://www.worldbank.org/wbi/governance/govdata2002/>
- Governance Diagnostic Capacity Building:
<http://www.worldbank.org/wbi/governance/capacitybuild/>

Data for Analysis and Informing Policy Advice; Not for Precise Rankings

The data in this presentation is from aggregate and individual governance indicators, and as emphasized, is subject to a margin of error (as are many other similar measures). Thus, it is not intended for precise comparative rankings across countries, but to illustrate performance measures, assist in drawing implications for strategy, and an input to further research. Neither the data nor the presentation necessarily reflect official views by the World Bank or its Board of Directors. Errors are responsibility of the authors, who benefited in this work from collaboration from many experts.

<http://www.worldbank.org/wbi/governance>