Science with a Mission

MISSION WITH A CAPITAL

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Our Challenge

- We as a nation and indeed we as members of the human community are faced with challenges, that unless solved, will substantially impact our collective future:
  - Climate change
  - Energy
  - Food production
  - Budget Deficits
  - Terrorism
  - Nuclear Security/Non-proliferation
  - Disease & pandemic
  - Availability of clean water
  - etc

What we do: our mission

- DOE is the single largest Federal government supporter of basic research in the physical sciences in the US
- Provides more than 40% of total Federal funding in this area.
- DOE is principal Federal funding agency of the Nation's research programs in high-energy physics, nuclear physics, & fusion energy sciences.
- SC manages fundamental research programs in basic energy sciences, biological and environmental sciences, and computational science.
- DOE largest single funder of materials and chemical sciences,
- DOE supports vital parts of U.S. research in climate change, geophysics, genomics, life sciences, and science education.

To what end

- Pursuing the fundamental breakthroughs needed to create a ***sustainable energy economy*** of the 21st century
- Understanding ***climate change*** and improving the environment
- Building ***research infrastructure*** and partnerships that foster innovation, and
- Unraveling ***nature's deepest mysteries***

Why this is important/why you should care

- The keys to our collective future run through three themes:
  - **Sustainability**
  - **Education**
  - **Innovation**
- History shows that money invested in these areas have high returns, as measured by ***quality of life***

Sustainability

- We spend/use less than we make/produce
- The next generation has an education level at or above the previous generation
- We leave or environment as good or better than the condition than we received it
- We ***act*** in ways consistent with this approach

GDP vs. Public Debt

Federal Debt Held by the Public
Under CBO's Two Budget Scenarios

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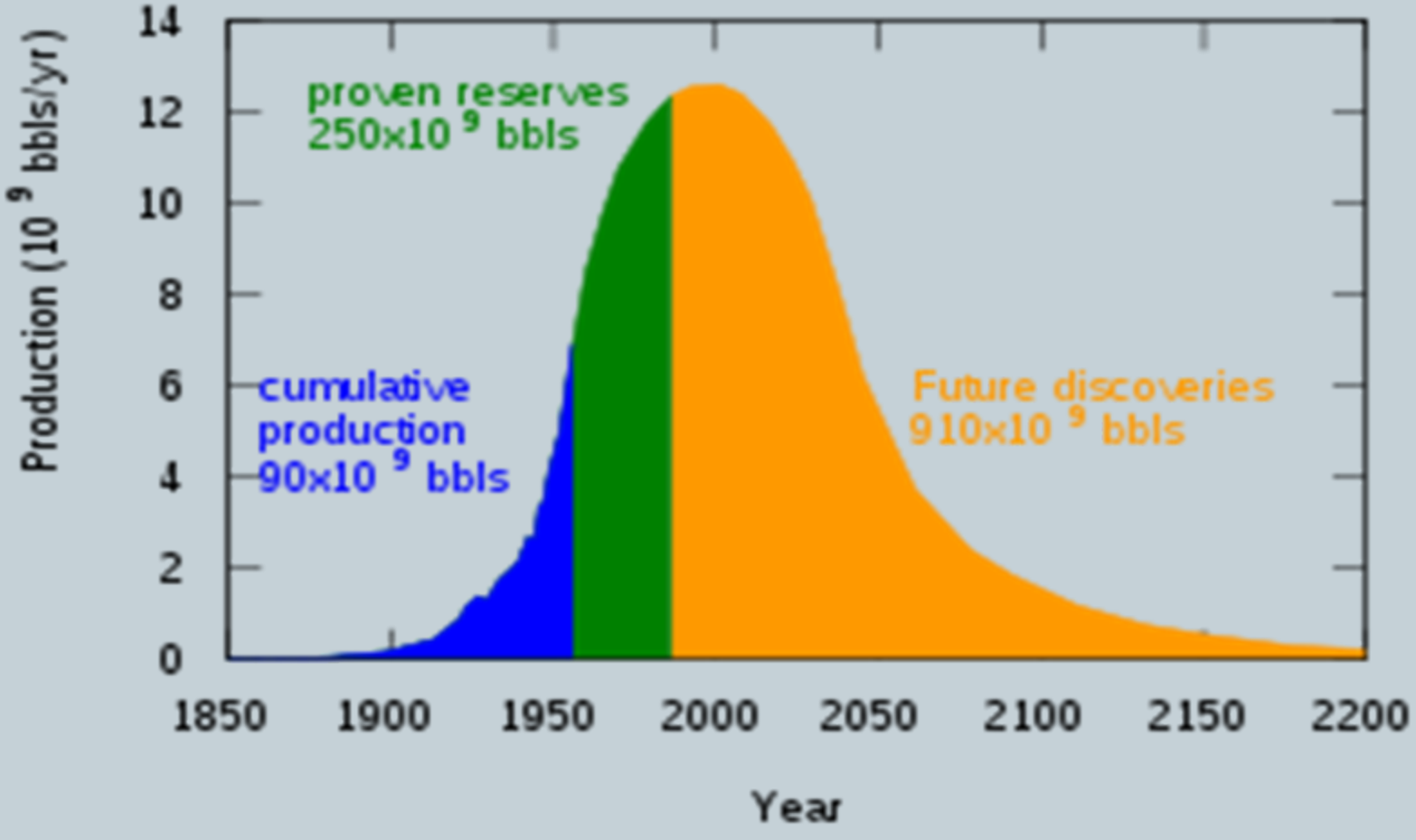
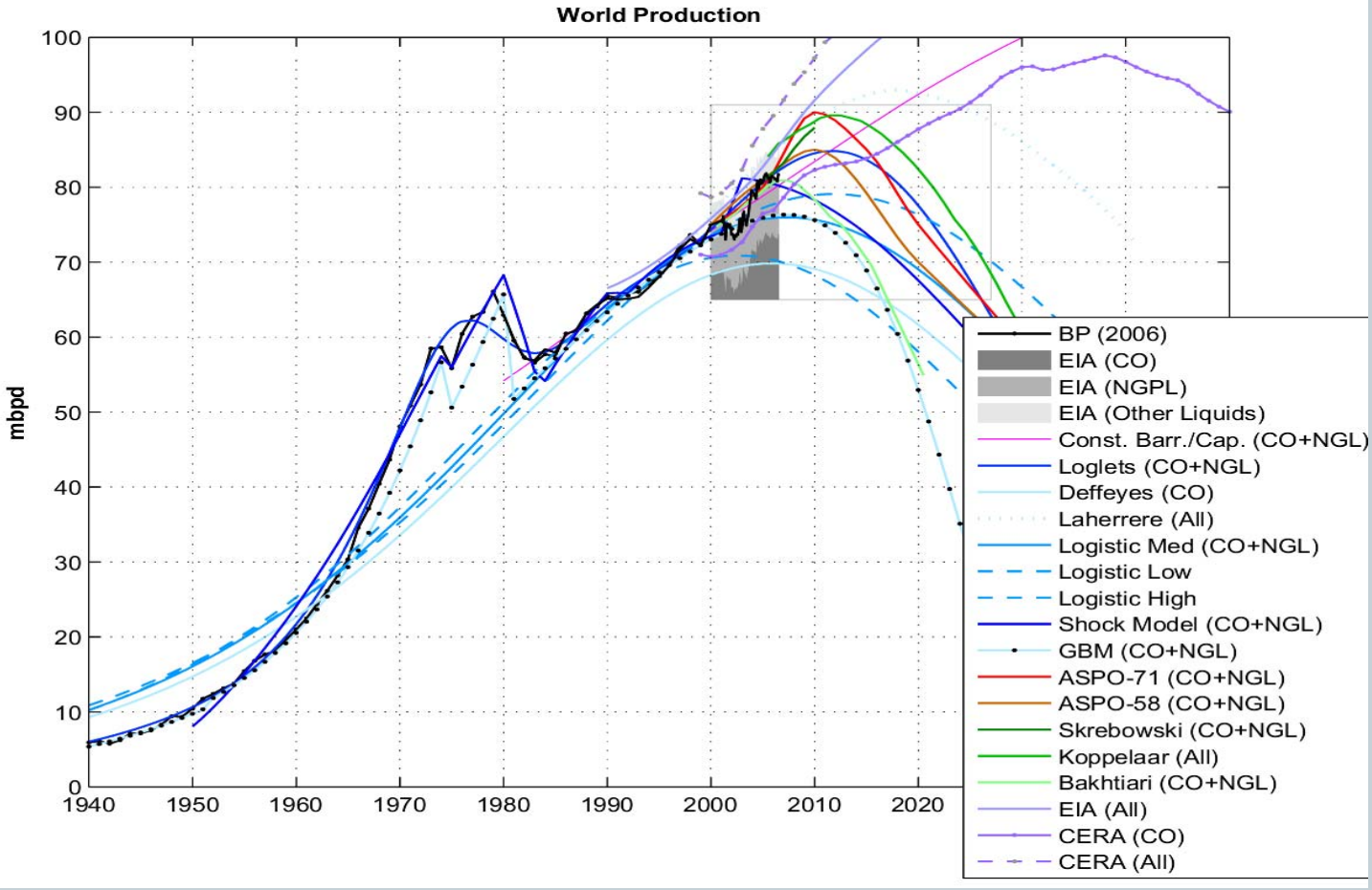
Peak Oil (M. Hubert 1956)



Peak Oil (updated)



Education

- “Education is our passport to the future, for tomorrow belongs to the people who prepare for it today” - Malcolm X

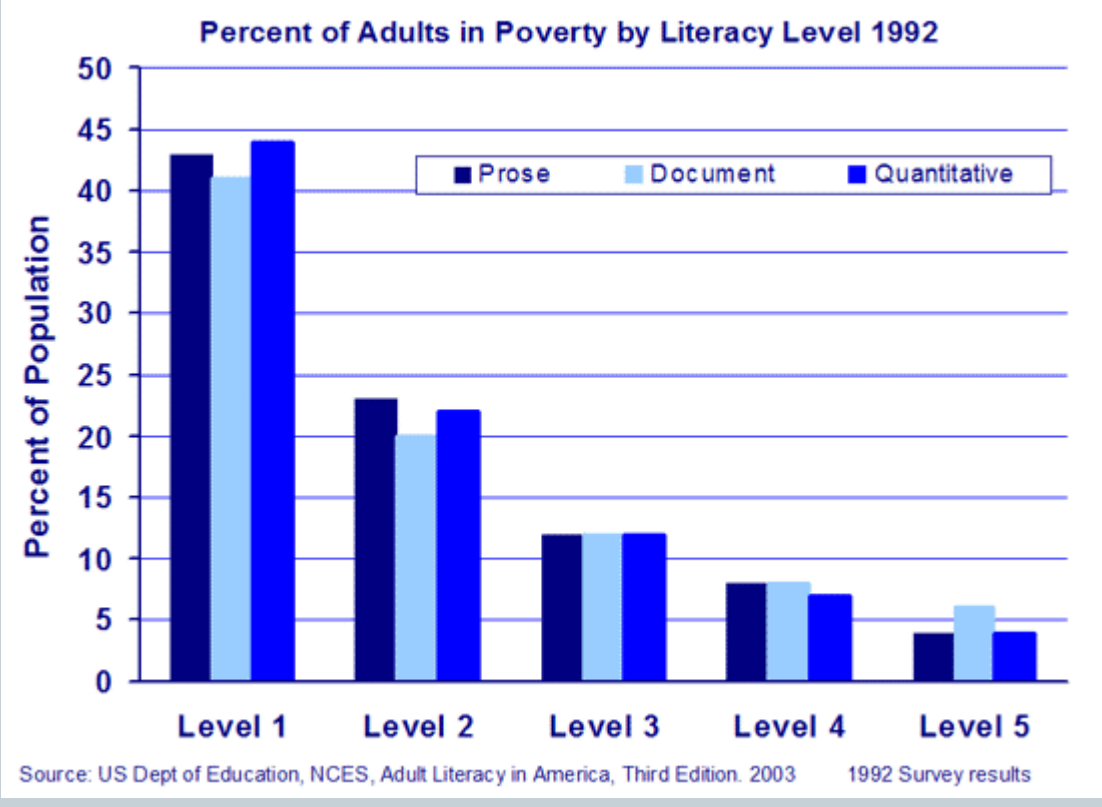
- The United States is no longer the world leader in secondary education; the United States 18th among the 36 nations examined. OECD

  "**The US has rested on its laurels way too long**, other countries have increasingly caught up and surpassed the United States.” Jacob Kirkegaard (Peterson Institute for International Economics in Washington)

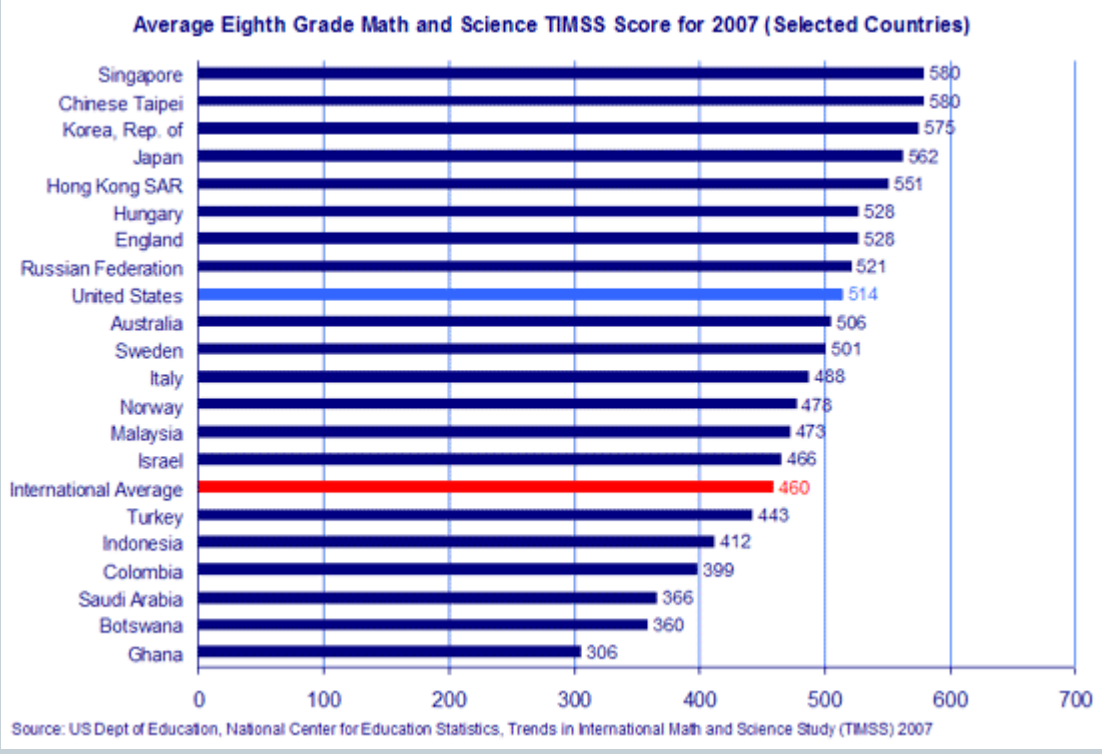
  "**We've been asleep for a good number of years as a country...**it's not that we're doing horrible, but the other guys are moving faster.” Richard Freeman (Harvard)

- US Rank (total 41) Math: **28** Reading: **18** Science: **22** Problem Solving: **29**

Poverty vs. Literacy



Eighth-Grade Test Scores



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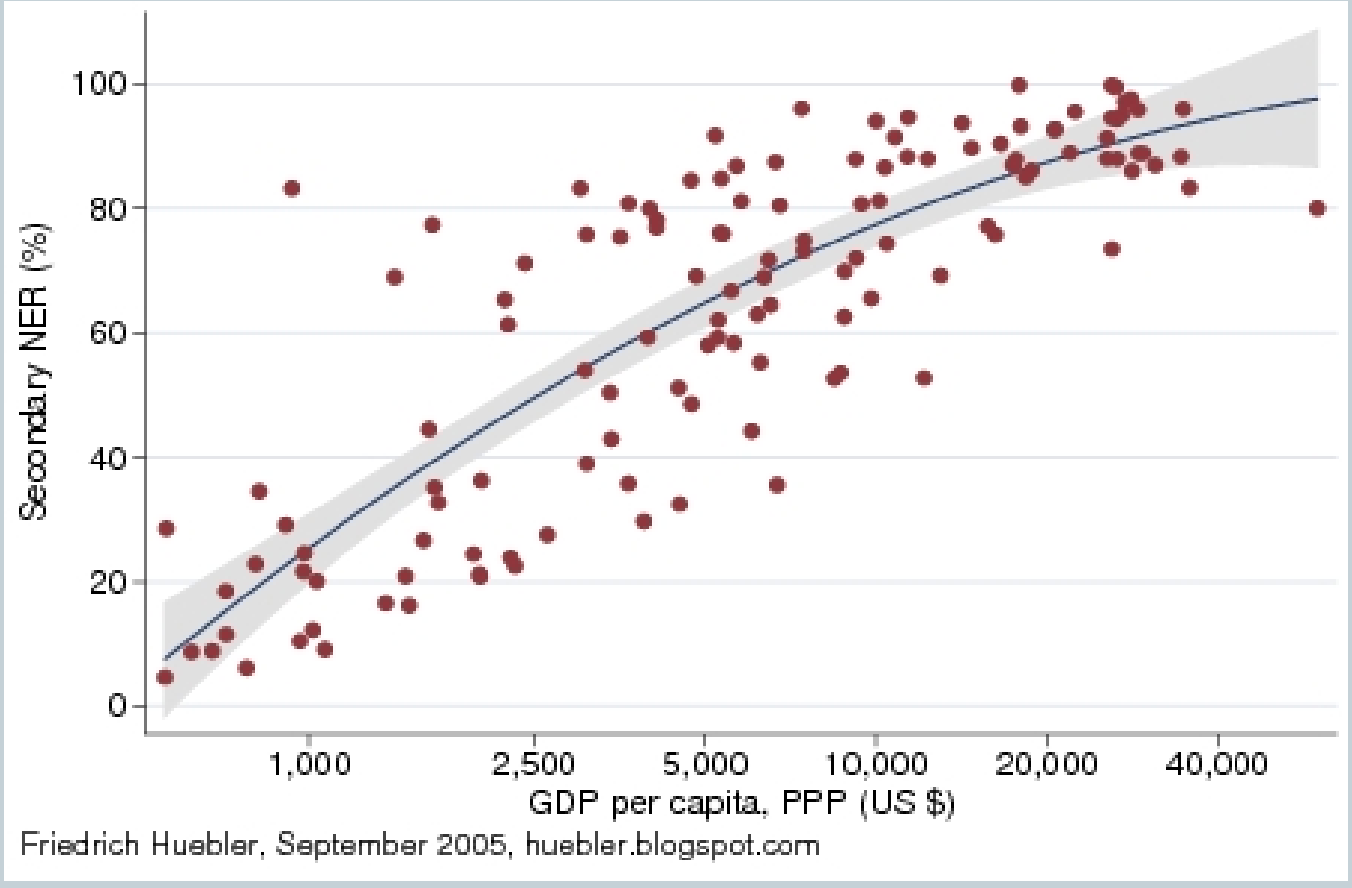
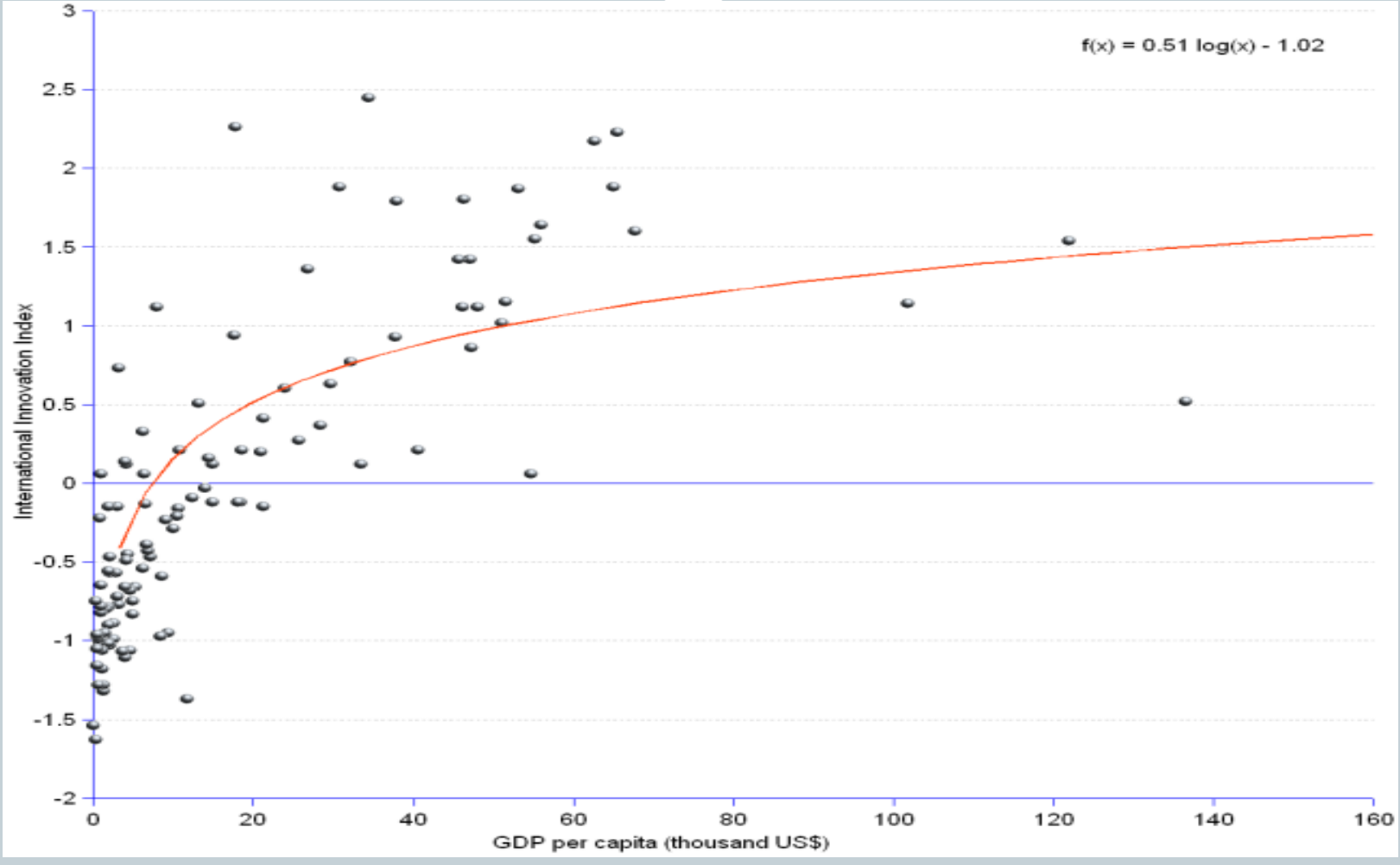
Education Rate vs. GDP



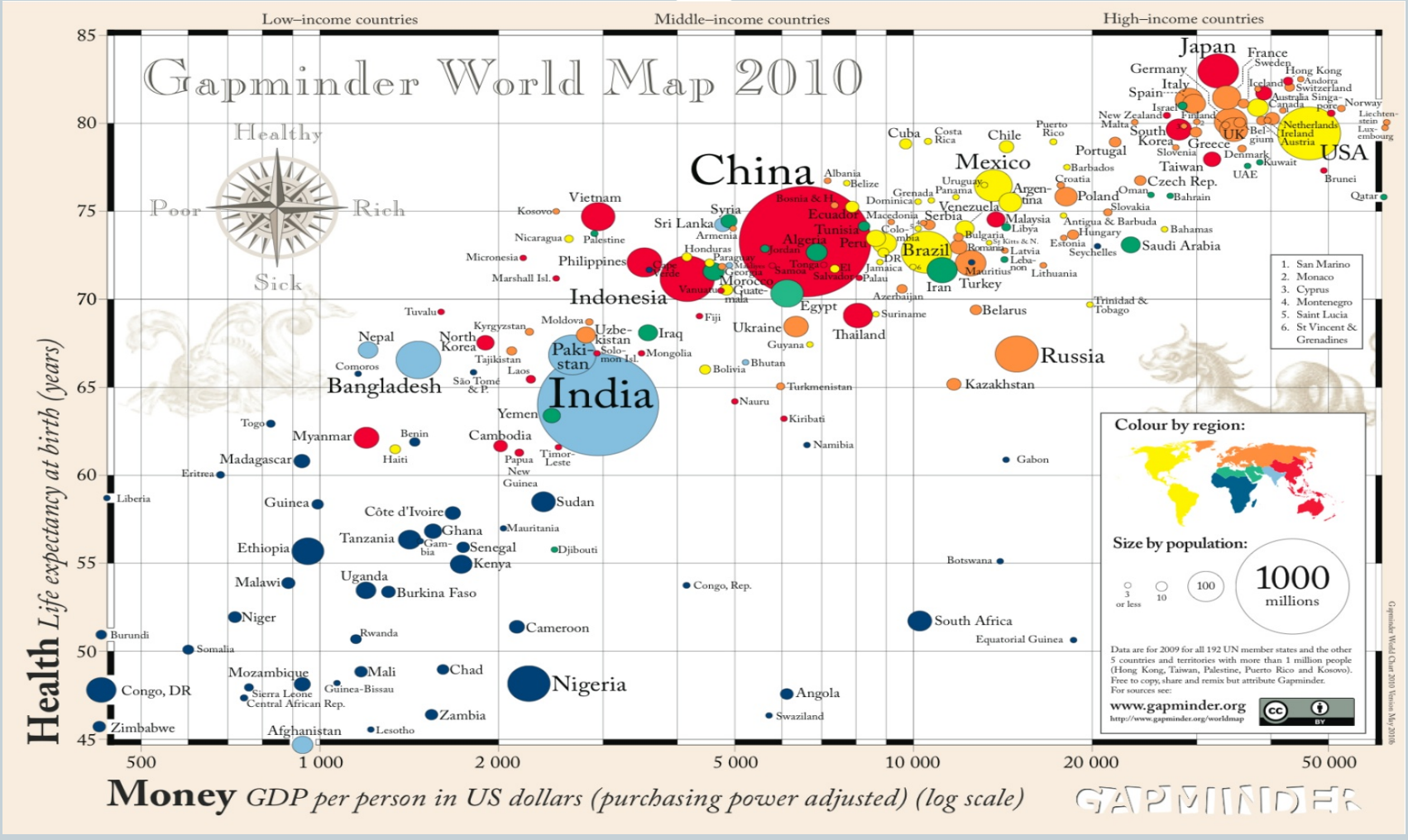
Innovation

- Key to any nations long-term success & prosperity
- Those nation's who are most innovative will be most prosperous (life expectancy, quality of life, infant mortality rates, human rights, literacy, poverty, etc) (http://filipspagnoli.wordpress.com/stats-on-human-rights/statistics-on-gross-domestic-product-correlations/)
- Innovation is made possible by education, determination, & investment
- It is a cycle that feeds on itself (reinvents/reinvests), but take away any element and it quickly evaporates

Innovation vs. GDP



Life Expectancy vs. GDP



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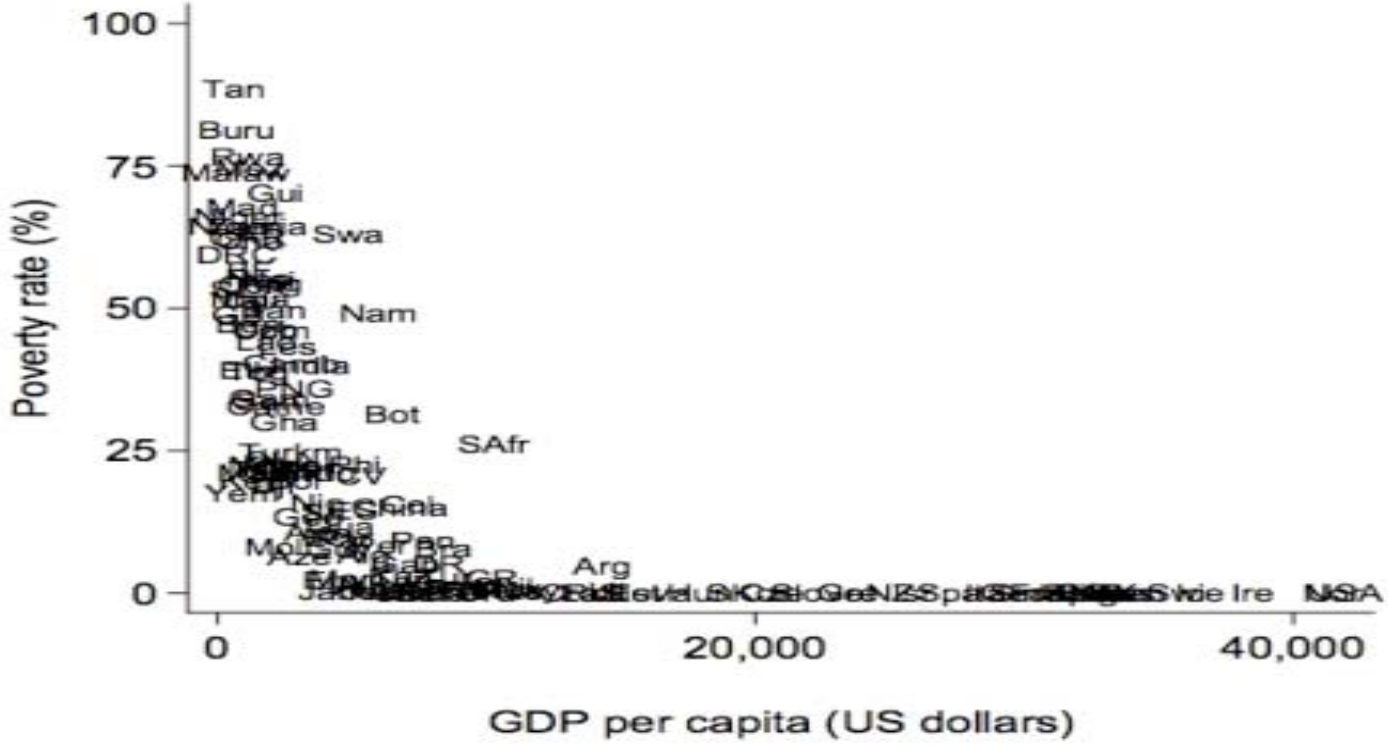
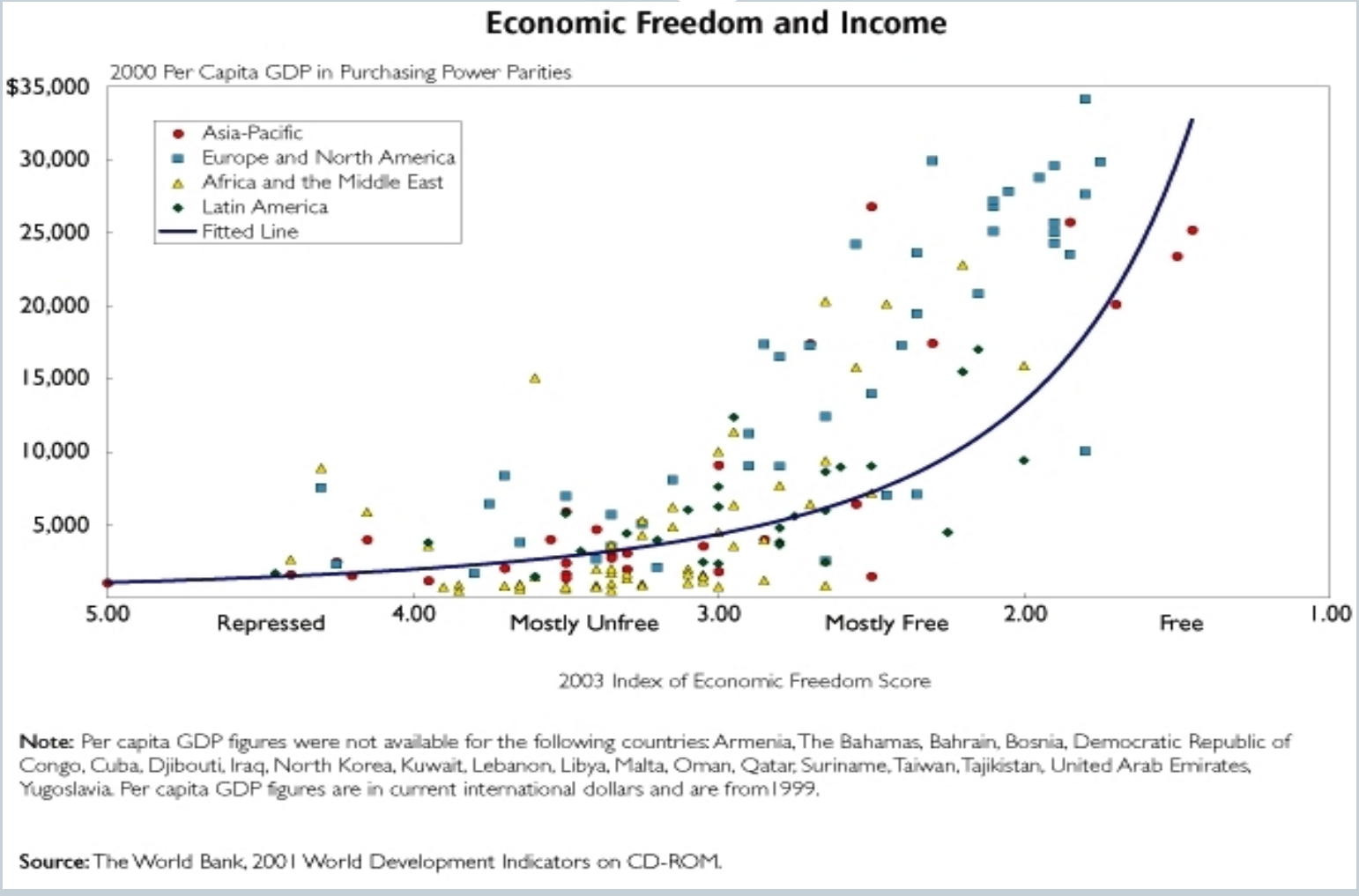
Poverty vs. GDP



Note: Data are for 2005. 133 countries. Poverty rate is the share of people in households with income or consumption of less than $1.25 per day. Currencies are converted into U.S. dollars using purchasing power parities (PPPs).

Source: United Nations Development Programme (UNDP), *Human Development Report*, various years; World Bank, iresearch.worldbank.org/PovcalNet/povcalSvy.html.

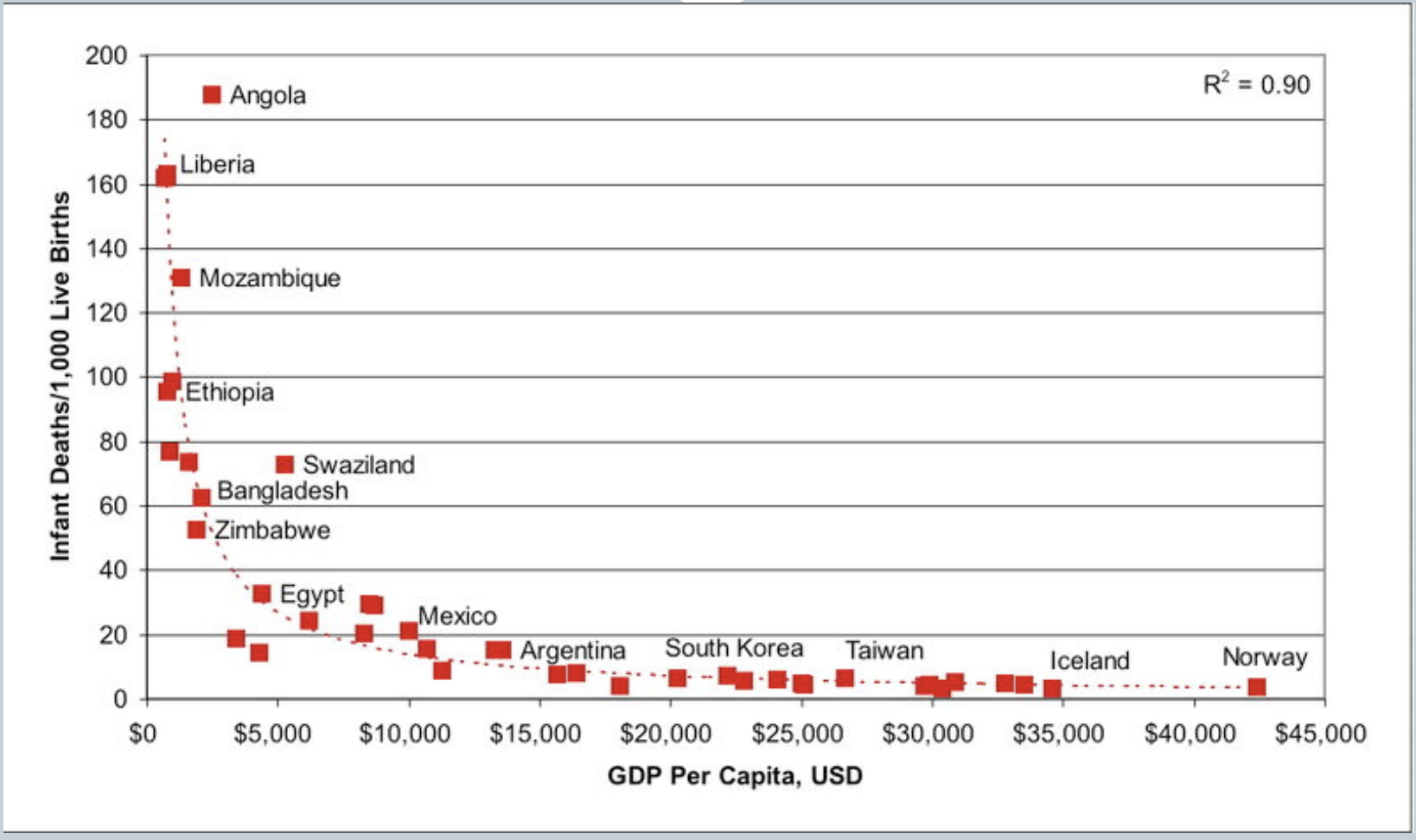
Freedom vs. GDP



Note: Per capita GDP figures were not available for the following countries: Armenia, The Bahamas, Bahrain, Bosnia, Democratic Republic of Congo, Cuba, Djibouti, Iraq, North Korea, Kuwait, Lebanon, Libya, Malta, Oman, Qatar, Suriname, Taiwan, Tajikistan, United Arab Emirates, Yugoslavia. Per capita GDP figures are in current international dollars and are from 1999.

Source: The World Bank, 2001 World Development Indicators on CD-ROM.

Infant Mortality Rate vs. GDP



GDP 2050 Rank Country

(In billions US Dollar [US$] equivalent)

Name	2000	2010	2020	2030	2040	2050	Change
CHN	1,078	2,998	7,070	14,312	26,439	**44,453**	**(40.0X)**
EU *	9,395	12,965	16,861	21,075	28,323	**35,288**	(3.7X)
USA	9,825	13,271	16,415	20,833	27,229	**35,165**	(3.6X)
IND	469	929	2,104	4,935	12,367	**27,803**	**(59.0X)**
JPN	4,176	4,601	5,221	5,810	6,039	**6,673**	(1.6X)
BRA	762	668	1,333	2,189	3,740	**6,074**	(8.0X)
RUS	391	847	1,741	2,980	4,467	**5,870**	**(14.8X)**
UK	1,437	1,876	2,285	2,649	3,201	**3,782**	(2.7X)
GER	1,875	2,212	2,524	2,697	3,147	**3,603**	(1.9X)
FRA	1,311	1,622	1,930	2,267	2,668	**3,148**	(2.4X)
ITA	1,078	1,337	1,553	1,671	1,788	**2,061**	(2.0X)

What Science Can Do

- Investments in education and science have very clear and high returns to any nation
- What we do here and now can impact the future
- Our Laboratories must be put in a position to deliver the mission
- We can operate safely, with high standards and meet mission objectives

What it is we seek to discuss

- Innovation and breakthroughs will only be possible if we understand the fundamental link that ***world leadership in laboratory operations enables and drives world leadership in science***

- World leadership in laboratory operations **requires** *innovative and integrated management systems and processes*

- SC has implemented a number of initiatives that we believe provide the foundation for excellence in operations that facilitates and drives innovation & discovery.

- SC's theme for this year's conference is

Mission-focused operational excellence drives outstanding laboratory performance