

Is U. S. Economic Growth Over? Controversy and Implications

**Robert J. Gordon, Northwestern,
NBER, CEPR, OFCE**

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The Standard View of Economic Growth

- U. S. Real GDP per capita grew at 2.18 percent per year between 1929 and 2007. That is “normal”.
- Any reduction below this “normal” is *temporary due to the financial crisis*.
- Long-term plans should continue to be based on future growth in U. S. per-capita GDP of 2 percent per year.

But This is Wrong for Two Reasons

- Innovation is Slowing down
- “Superstorm Sandy” provides better proof than any abstract argument I could provide
- This talk organizes economic progress according to the three big Industrial Revolutions:
 - IR #1, IR #2, and IR #3

Organizing Principle: The IR's

- **First Industrial Revolution (IR #1), 1770-1830**
 - Steam engine, cotton spinning, railroads, iron and steel
- **Second Industrial Revolution (IR #2), 1870-1910**
 - Electricity, elevators, power tools, electrified factories
 - Internal combustion engine: cars, trucks, busses, airplanes
 - Running water and indoor plumbing
 - Telegraph, telephone, radio, motion pictures
 - Chemicals, drugs starting with aspirin

Incremental Improvements After the Initial Inventions

- **IR #1**
 - 85% of U. S. RR mileage built after 1870
 - Intercity elapsed times 3X faster 1940 than 1870
- **IR #2: Further developments continued to 1970**
 - Airplane, jet aircraft
 - Interstate highway system, nonstop coast to coast
 - Air conditioning

The Third IR, Computers and Electronics and the Web

- **It started 50 years ago in 1960**
- **Initially it replaced human labor just as did the previous IRs**
 - **1960s bank statements and telephone bills**
 - **1970s airline reservation systems and the first ATMs**
 - **1980s bar code scanning and the first PCs**
 - **1990s the web, e-commerce, e-mail became universal even via dial-up**

The Basic Case: Econ Growth is Over in U.S. (no comment on elsewhere)

- **Faltering innovation: the new post-2000 inventions are much less important compared to the great inventions of IR #2.**
- **Superstorm Sandy: no electricity, rotten food in refrigerators and freezers, no heat, no way to heat food, no gas for cars, in some places no running water and sewerage outflow.**

Innovation Continues, but How Important Compared to the Old Ones

- **Some inventions could only be invented once.**
 - **Indoor comfort: central heat and a/c**
 - **Speed: Hoof and sail to Boeing 707, no further**
 - **Light, elevators, consumer appliances**
- **We aren't inventing anything now to match those core inventions of the second IR**

Two Complementary Arguments,

What if Both Were True?

- **Faltering Innovation**
 - The Innovations of IR #3, especially since 2002, do not measure up to IR #2
 - Superstorm Sandy provides the evidence
- **Six headwinds**
 - The six are designed for the US Economy
 - Which do the European economies avoid?
 - Hint: Canada and Sweden avoid some, maybe others

Figure 1: Growth in Real GDP per Capita, 1300-2100

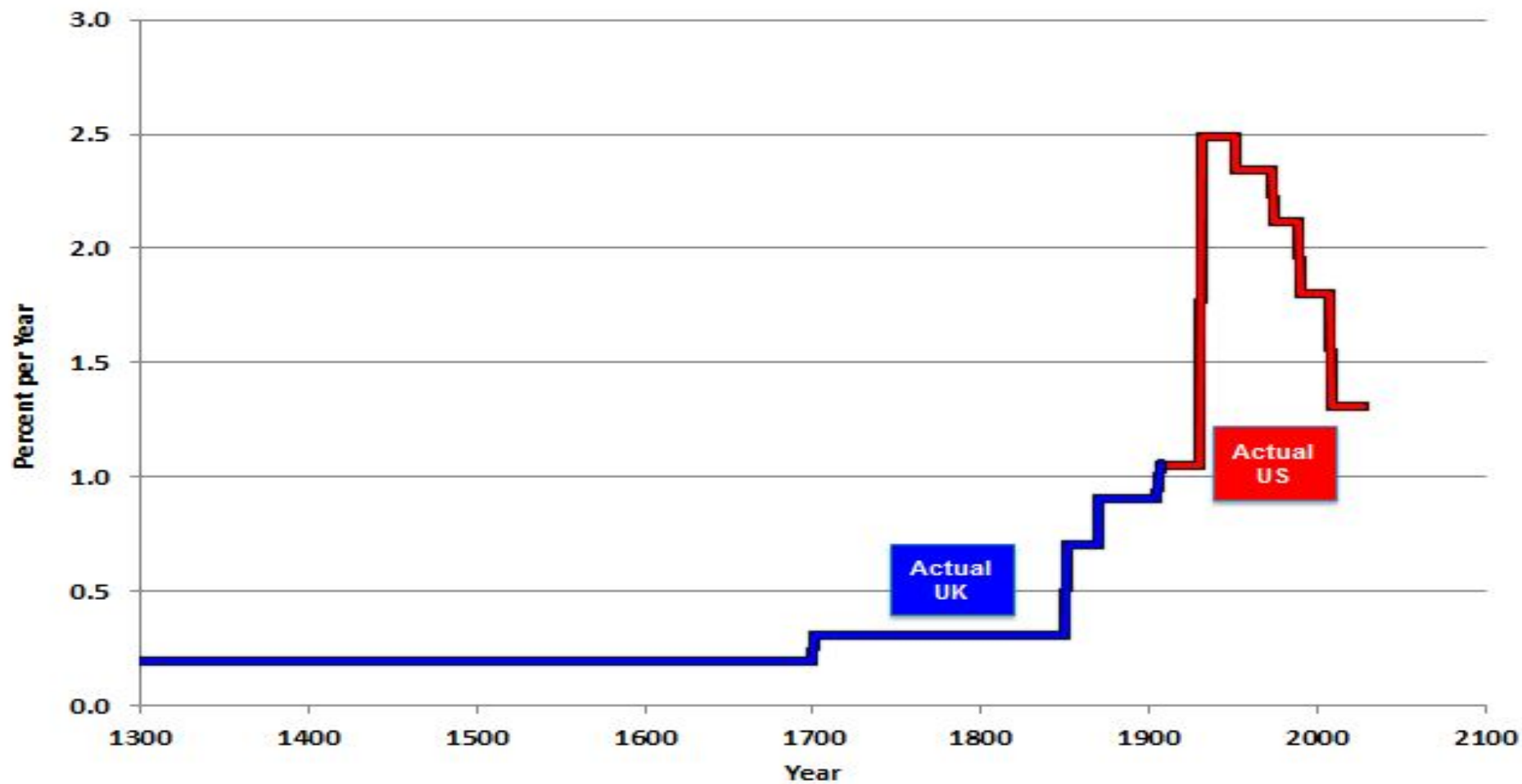


Figure 2: Growth in Real GDP per Capita, 1300-2100, with Actual and Hypothetical Paths

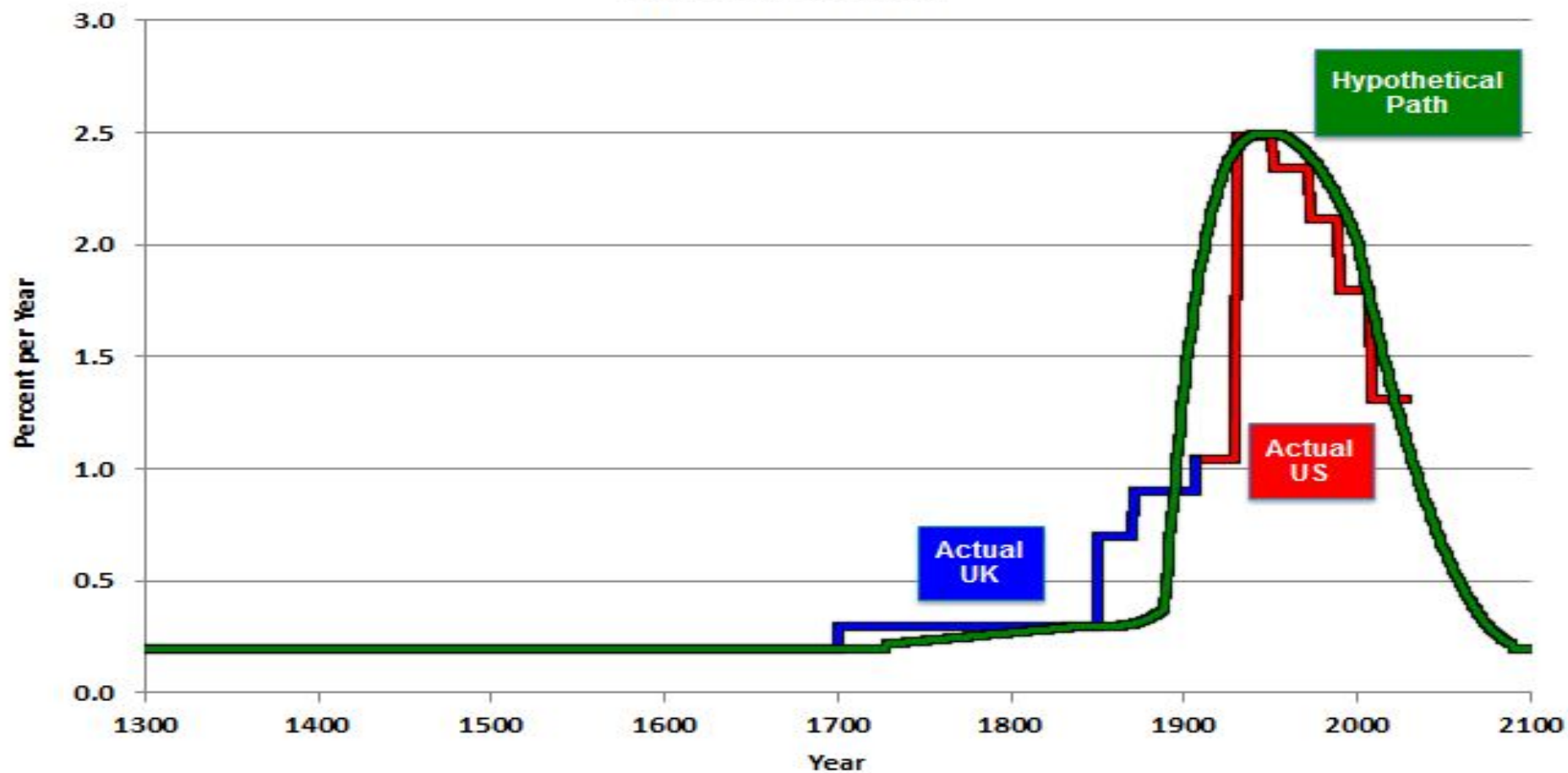
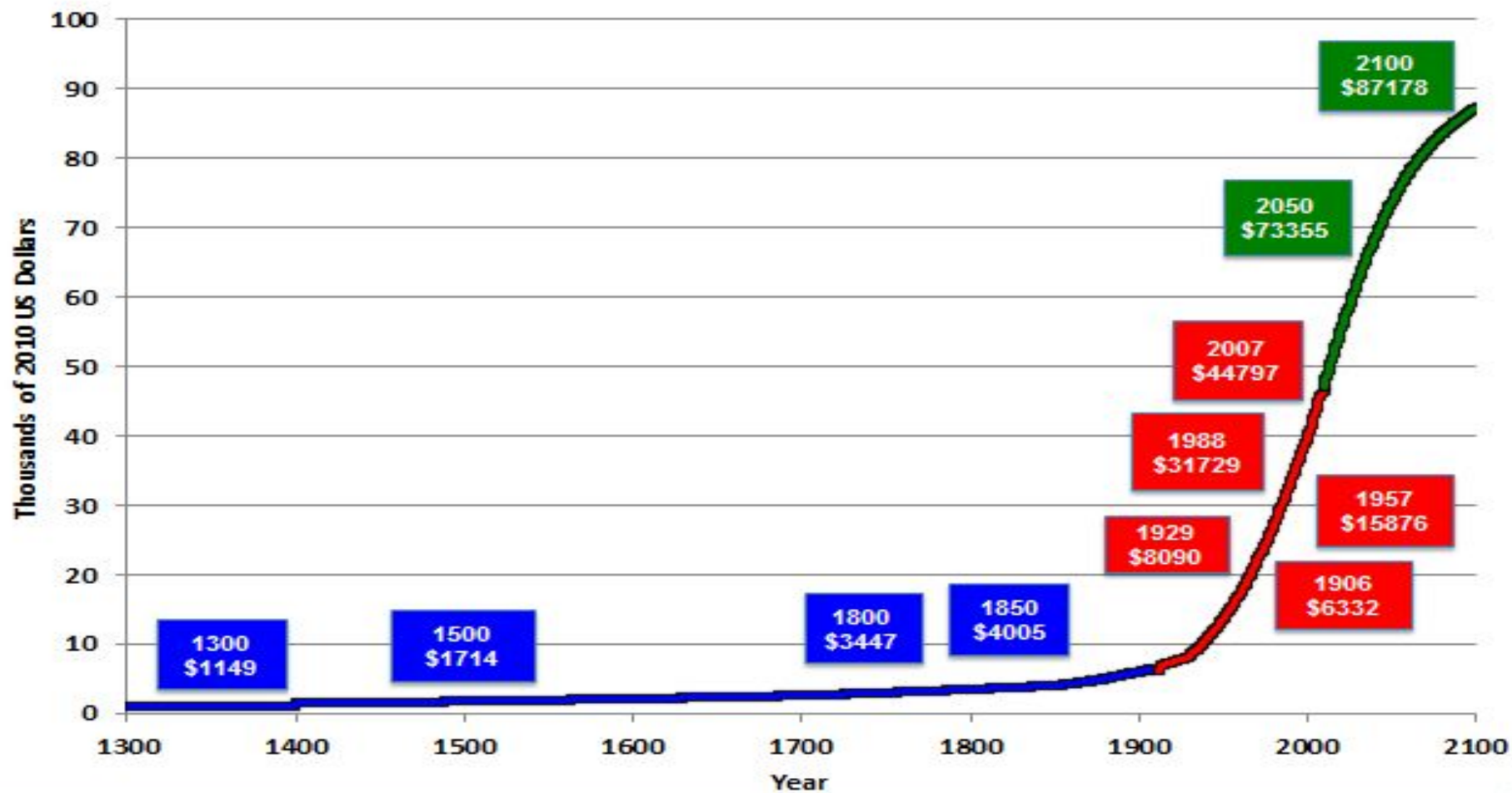


Figure 3: Actual and Hypothetical Levels of GDP per Capita, 1300-2100



Difference in Post-2001 Inventions

- **From 1960 to 2000, many IR #3 inventions involved the direct replacement of human labor by machine power**
 - **From the earliest telephone bills & bank statements to replacement of paper catalogues by electronic catalogues**
- **Since 2001 the most prominent inventions replace one form of entertainment or communication by another**
 - **Walkman to ipod, cell phone to smart phone, laptop to ultrabook and ipad**

Thought Experiment: How Important Were Innovations during 2001 – 2011?

- **Choice A: You get 2001 electronic technology and get to keep running water and indoor toilets. But you can't use any electronic invention introduced since 2001.**
- **Choice B is that you get everything invented in the past decade, right up to facebook, twitter, and the ipad 2, but you have to give up running water and indoor toilets.**
- **Which do you choose?**

Figure 4: Average Growth Rates of US Labor Productivity Over Selected Intervals, 1891-2012

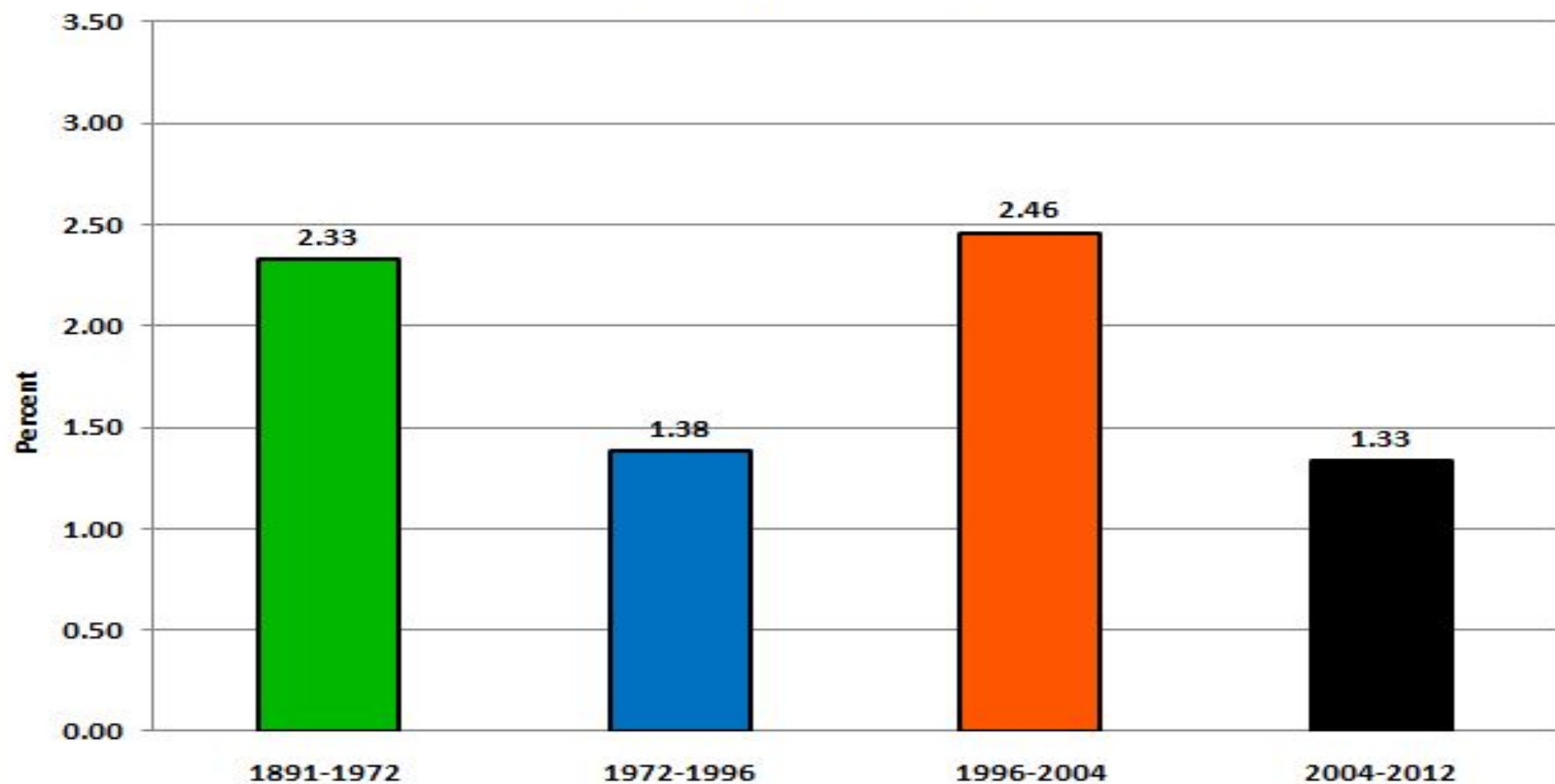
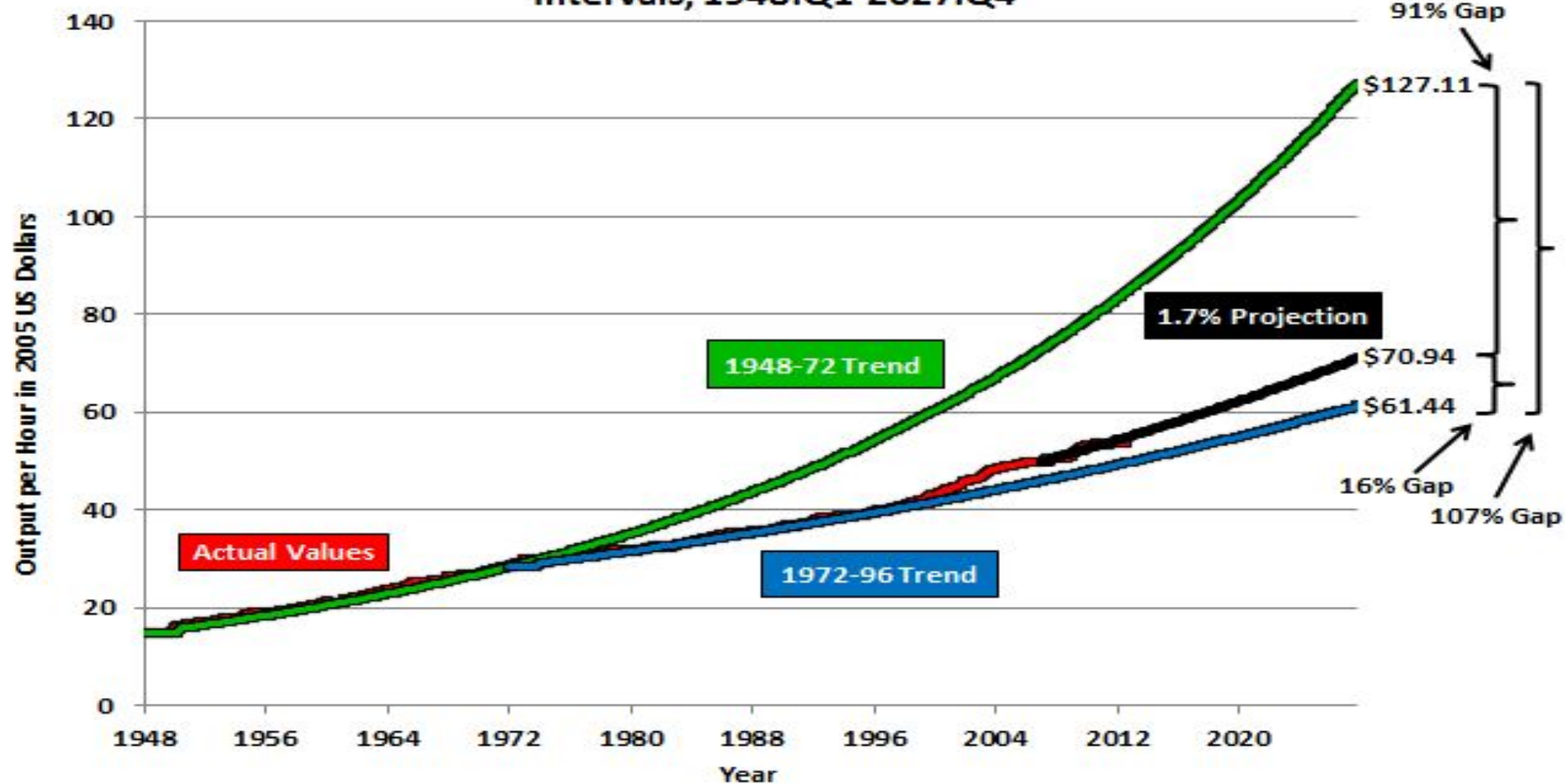


Figure 4: US Labor Productivity and Trend Growth Rates over Selected Intervals, 1948:Q1-2027:Q4



Last Section of Talk

- While innovation continues at a frenetic pace of innovation, the effect of innovations on the quality of life and work is diminishing
- **We could do these things only once, not again**
 - Replace the horse with the motor car and truck
 - Replace back-breaking labor of housewives by consumer appliances and running water
 - Achieve an even 72° temperature year-round
 - Travel at 550 mph on a jet plane instead the speed of a horse

But Let's Heed the Lessons from the Follies of Forecasting

- Let's *pretend* that the pace of innovation will continue at the same pace as in 1987-2007
- My 2007-vintage forecast is for income per-capita growth of 1.4 (compared to 2.2).
- This 1.4 forecast incorporates only *two* of the *six* “headwinds” putting the brakes on the growth of the U. S. standard of living

The First Two Headwinds, incorporated into 2007+ Forecast

- **#1. Demographic Dividend is Reversed**
 - Y/N grew **faster** than Y/H 1970-1995 because of female entry to the labor force and Baby Boom bulge of labor-force entry
 - Y/N will grow **slower** after 2011 due to Baby-Boom retirement
- **#2. Plateau of Educational Attainment**
 - Cost inflation in higher education, mounting student debt distorts life choices
 - Poor math-science scores in OECD cross-country tests
 - Achievement gap of black and hispanic minorities

Figure 7: US Output per Capita and Trend Growth Rates over Selected Intervals, 2007:Q1-2027:Q4

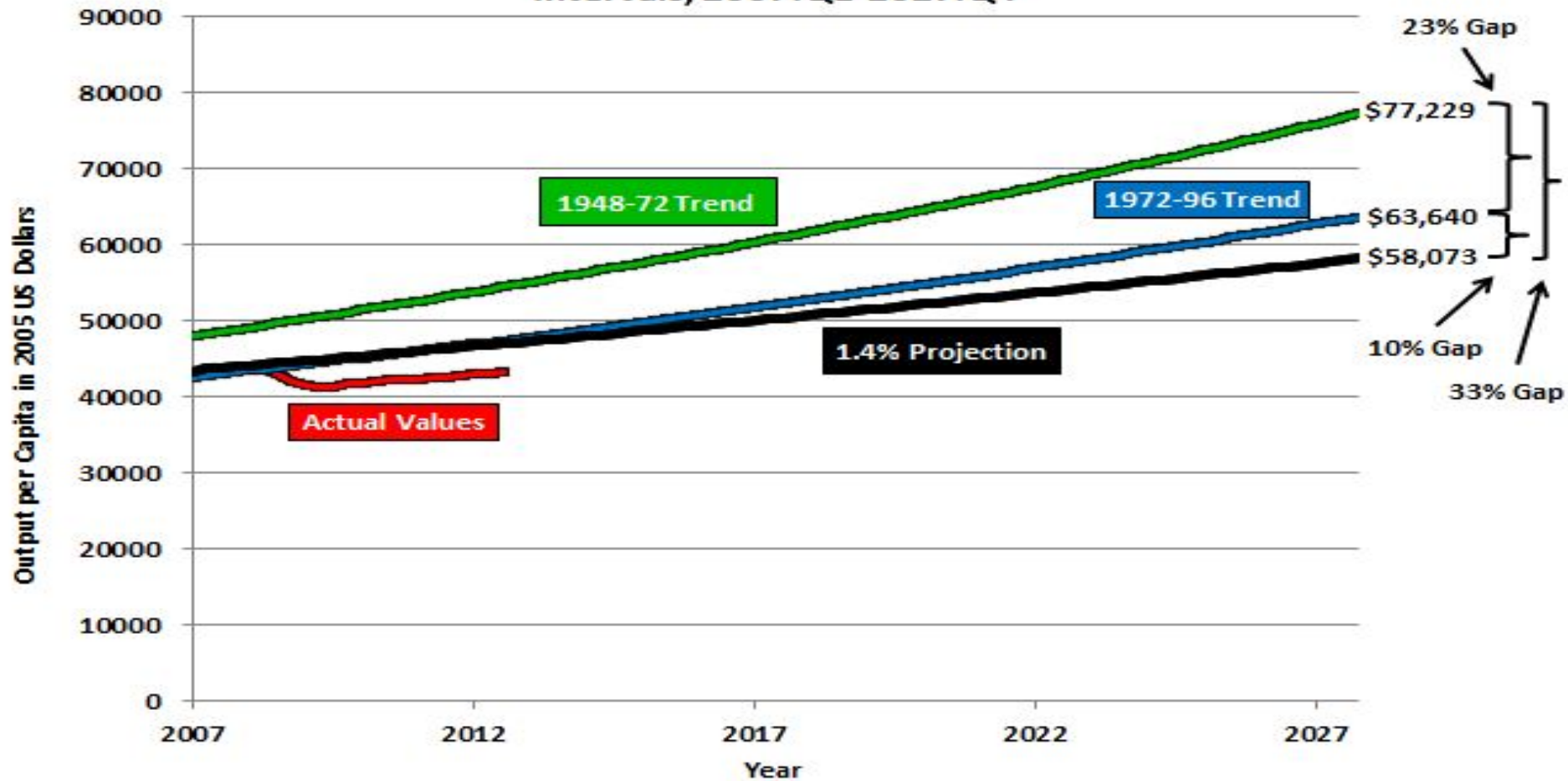


Figure 5: US Output per Capita 2007:Q1-2012:Q3, Projected 1.4% Trend Growth Rate 2007:Q1-2027:Q4

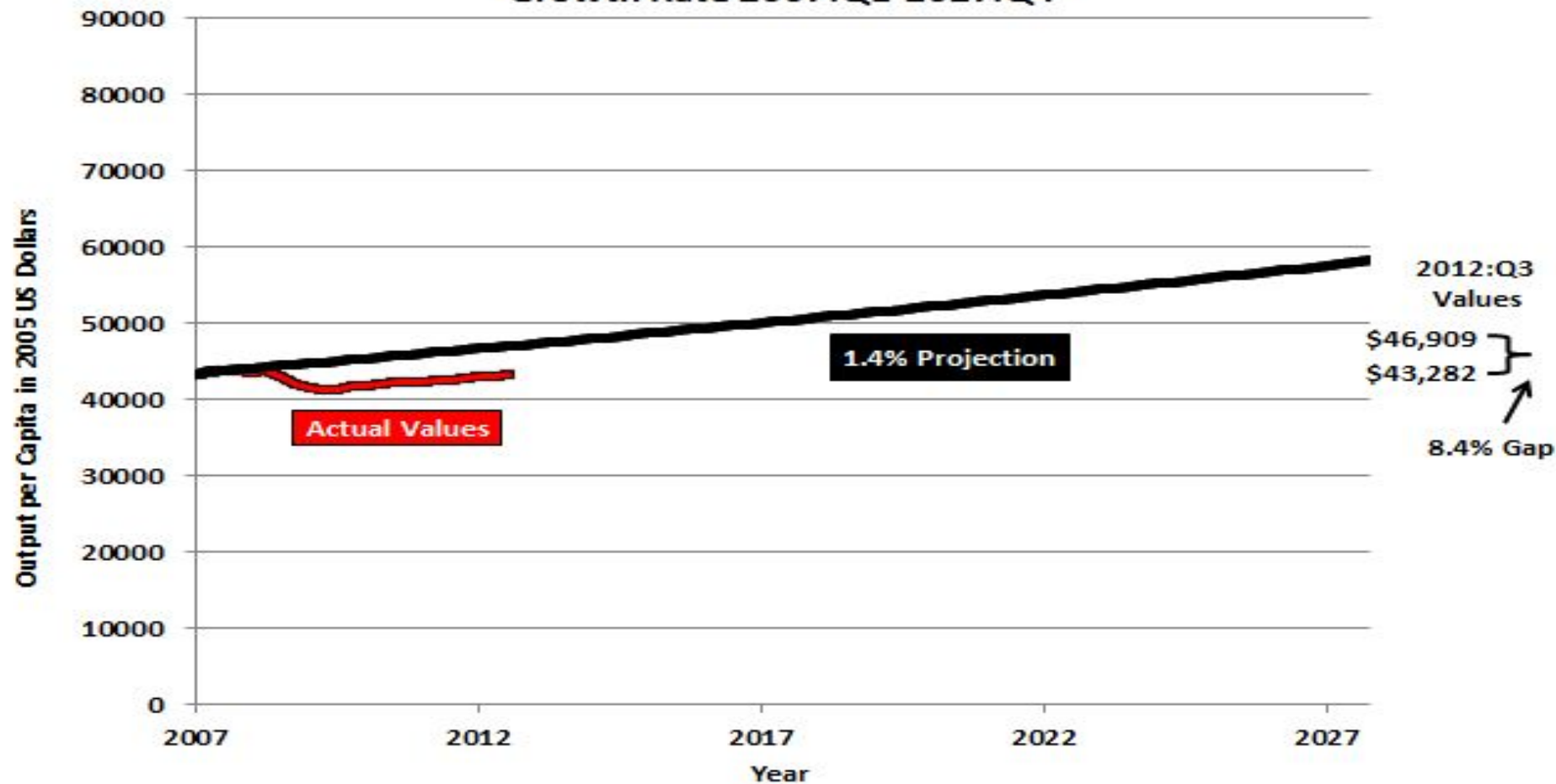
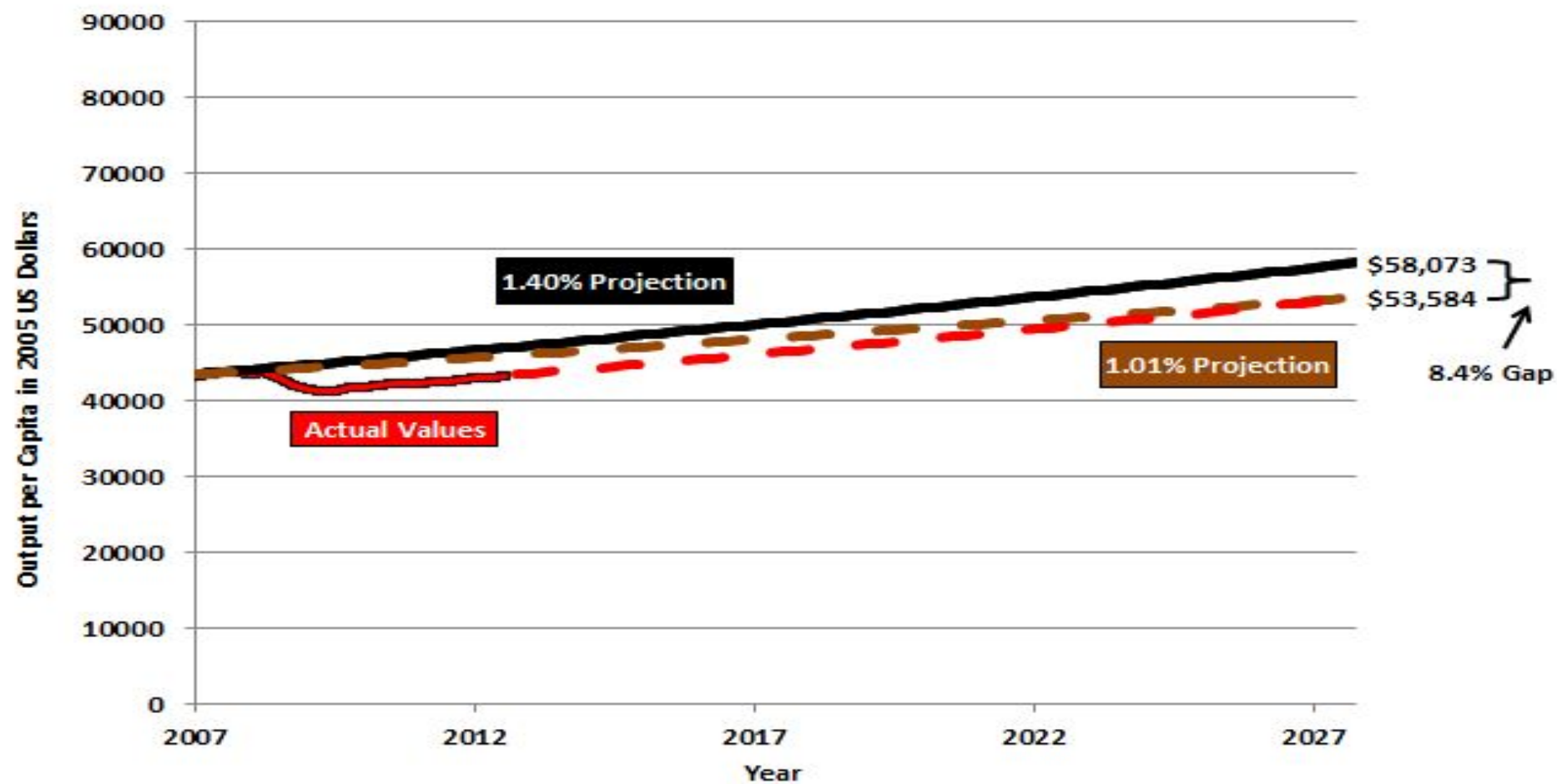


Figure 6: US Output per Capita and Projections, 2007:Q1-2027:Q4



More Headwinds, Here are #3 and #4

- **#3. Inequality: growth in median income is much slower than in statistical averages for income per capita**
 - 1993-2008. Growth of average real household income = 1.3%
 - Growth in bottom 99%, 0.75%. Top 1%, 3.9%
 - Top 1% captured 52% of income gains during 1993-2008
- **#4. Globalization linked with IT: Hurts the leading nation more than others. Outsourcing, imports hollow out the middle of the occupational distribution**

Headwinds #5 and #6

- **#5. Environment:** Payback for past growth, sacrifice for emerging market growth (is it fair?)
 - 1901 full steam ahead, environment be damned
- **#6. Twin deficits: consumer and government debt overhang.** However slow is growth in production per capita, consumption per capita will grow slower.

**Figure 6: Components of the Exercise in Subtraction, from 1987-2007
Growth in Per-capita Real GDP, To Hypothetical Future Growth in Real
Consumption Per Capita for the Bottom 99 Percent**

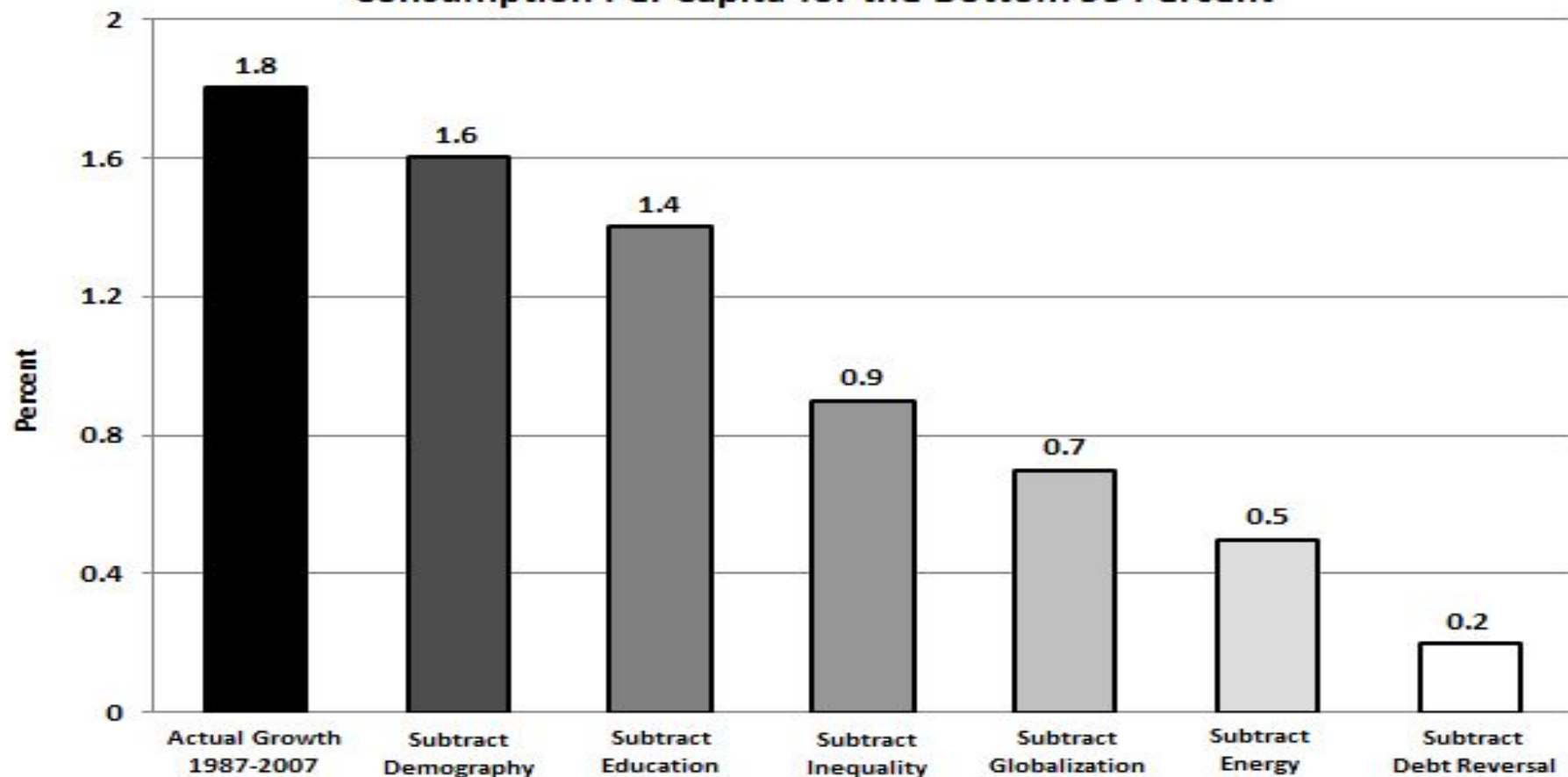
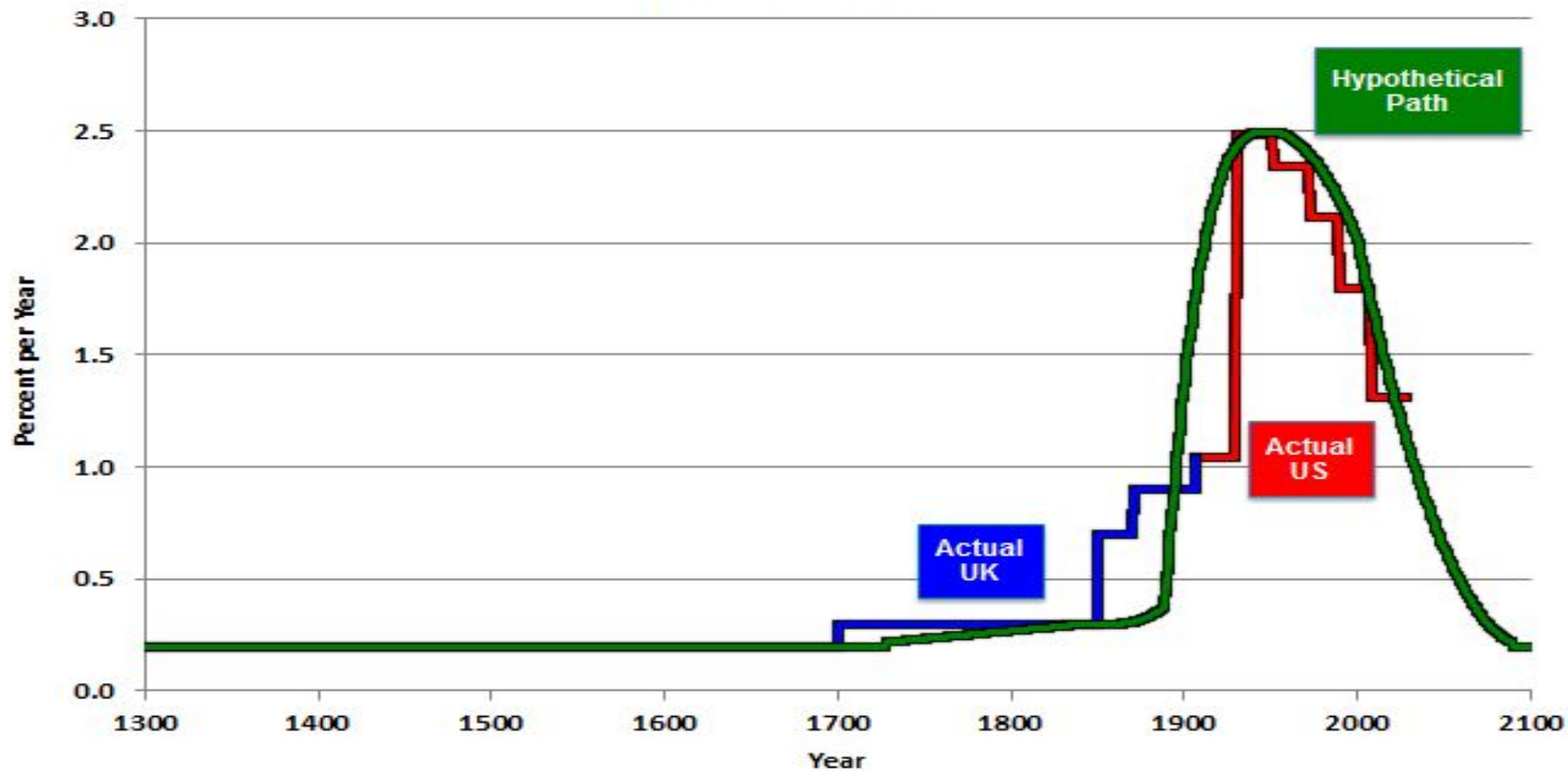


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What are Your Solutions?

- **These are big problems. Here is some of the low-hanging fruit of solutions**
- **#1 Demography**
 - **Populate our inner cities with immigrants**
 - **Raise the retirement age of Social Security**
- **#2 Education**
 - **Minority education – Heckman's early intervention**
 - **Higher Education – income contingent student loans administered by Federal government, no middlemen**

More Solutions

- **#3 Inequality: CEO and super-star pay, sports and entertainment, are pure rents; Henry George in 1879 said the optimal tax is on rents. (The economy grew just fine from 1948 to 1973)**
- **#4 Globalization, factor-price equalization. We have to be smarter than them. Why do Chinese ace the math tests, Germans do vocational education so well?**

More Solutions

- **#5 Environment. US shouldn't do anything without reform in China and India which spew out most of the world's carbon. No solution**
- **#6 Debt, deficits. Easy fix to Federal deficit, take Bowles-Simpson and juice it up. Social security is easy, medical care requires forced conversion from fee per service to Mayo-clinic-type group practices responsible for prevention, not just services.**

Questions for Our Discussion

- **Do you buy my theme that long-run growth is temporary? That many inventions were one-time-only?**
- **What can we learn from differences among countries. Are Canadians or Swedes as pessimistic? Why not?**
- **What are your solutions for the headwinds if you don't like mine?**