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

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

UBS European Conference

London, November 13, 2012
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

- **Actual UK**: Blue line indicates the growth of Real GDP per Capita for the UK over the years from 1300 to 2100.
- **Actual US**: Red line indicates the growth of Real GDP per Capita for the US over the years from 1300 to 2100.
Figure 2: Growth in Real GDP per Capita, 1300-2100, with Actual and Hypothetical Paths

- Hypothetical Path
- Actual
  - US
  - UK
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**: 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

- 1891-1972: 2.33%
- 1972-1996: 1.38%
- 1996-2004: 2.46%
- 2004-2012: 1.33%
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

- Actual Values
- 1.4% Projection
- 2012:Q3 Values: $46,909
- $43,282
- 8.4% Gap
Figure 6: US Output per Capita and Projections, 2007:Q1-2027:Q4

- **Actual Values**: $40,000, $50,000, $60,000, $70,000, $80,000, $90,000
- **1.40% Projection**: $58,073
- **1.01% Projection**: $53,584
- **8.4% Gap**
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

- Actual Growth 1987-2007: 1.8%
- Subtract Demography: 1.6%
- Subtract Education: 1.4%
- Subtract Inequality: 0.9%
- Subtract Globalization: 0.7%
- Subtract Energy: 0.5%
- Subtract Debt Reversal: 0.2%
Figure 2: Growth in Real GDP per Capita, 1300-2100, with Actual and Hypothetical Paths
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?