

How Was the U.S. Economy Doing Prior to the 2016 Election?

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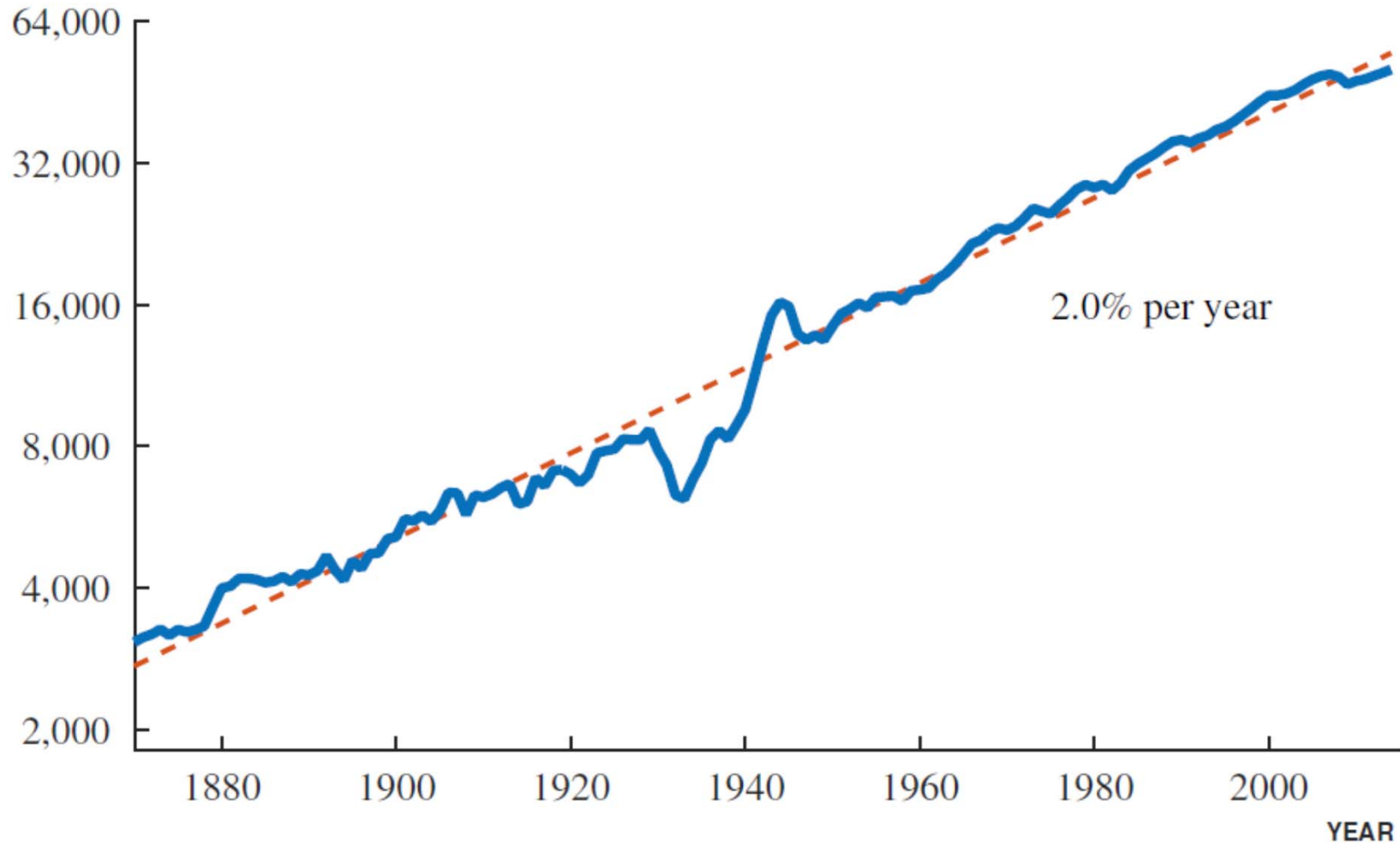
US Growth Path 1870-2014

- Growth rate of GDP per capita averaged 2.0%
- Living standards doubled every 36 years on average

Plotted are log GDP per capita and its growth path

GDP Per Person in the United States

LOG SCALE, CHAINED 2009 DOLLARS



Note: Data for 1929-2014 are from the U.S. Bureau of Economic Analysis, NIPA Table 7.1. Data before 1929 are spliced from Maddison (2008). Source: C. Jones (2016).

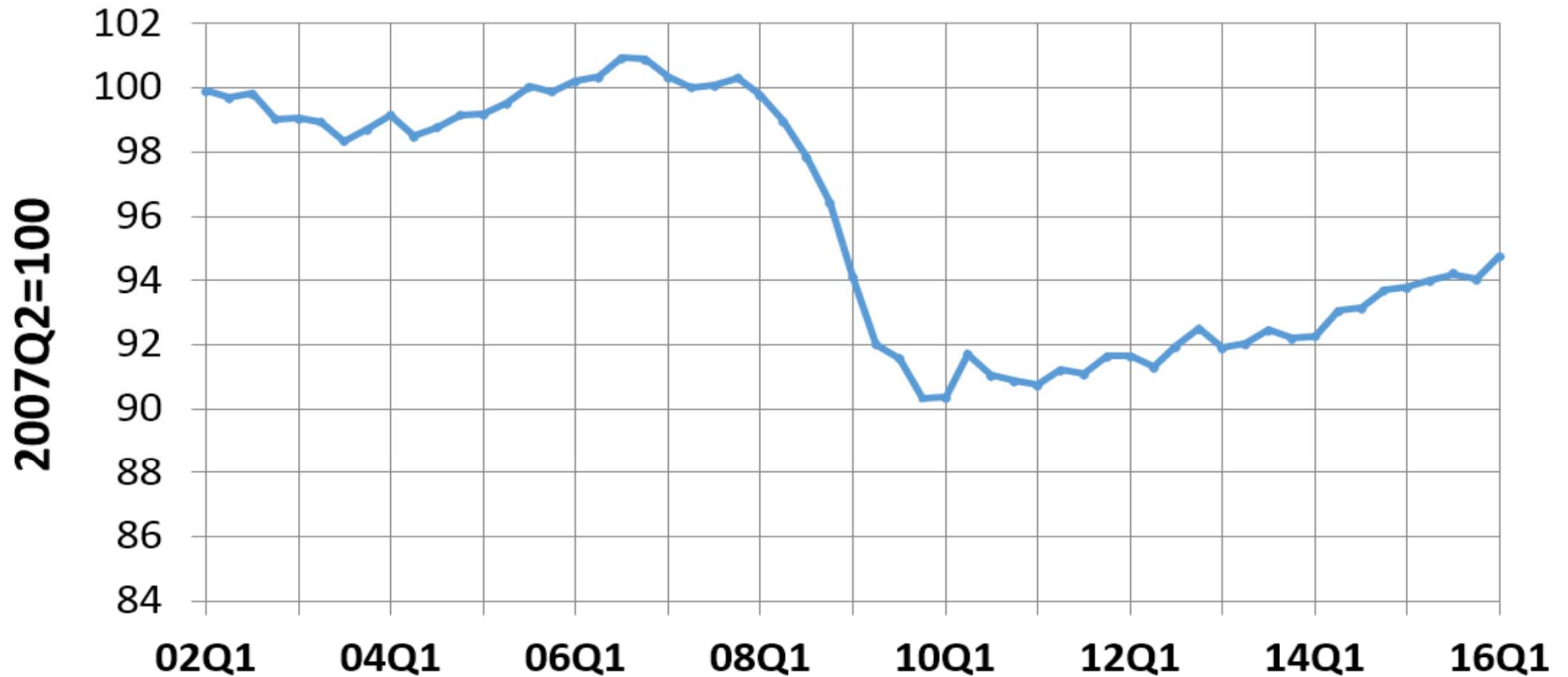
Theory Used

- Neoclassical growth theory which is the basis for quantitative dynamic aggregate theory
- Associated with a policy regime is a growth path to which the economy converges
- The growth rate along a growth path at a point in time is constant across countries

Hours Worked Numbers Say US Economy was on a Growth Path

- There was a recession in 2008 resulting from a combination of factors
 - Cutting immigration in beginning August 2007
 - End of a mini hi-tech boom
 - New ruling coalition was anti productivity growth
 - Policy that led of overbuilding of housing
- Hours behaved just as theory predicts

Annual Hours Worked Per Capita (16+)

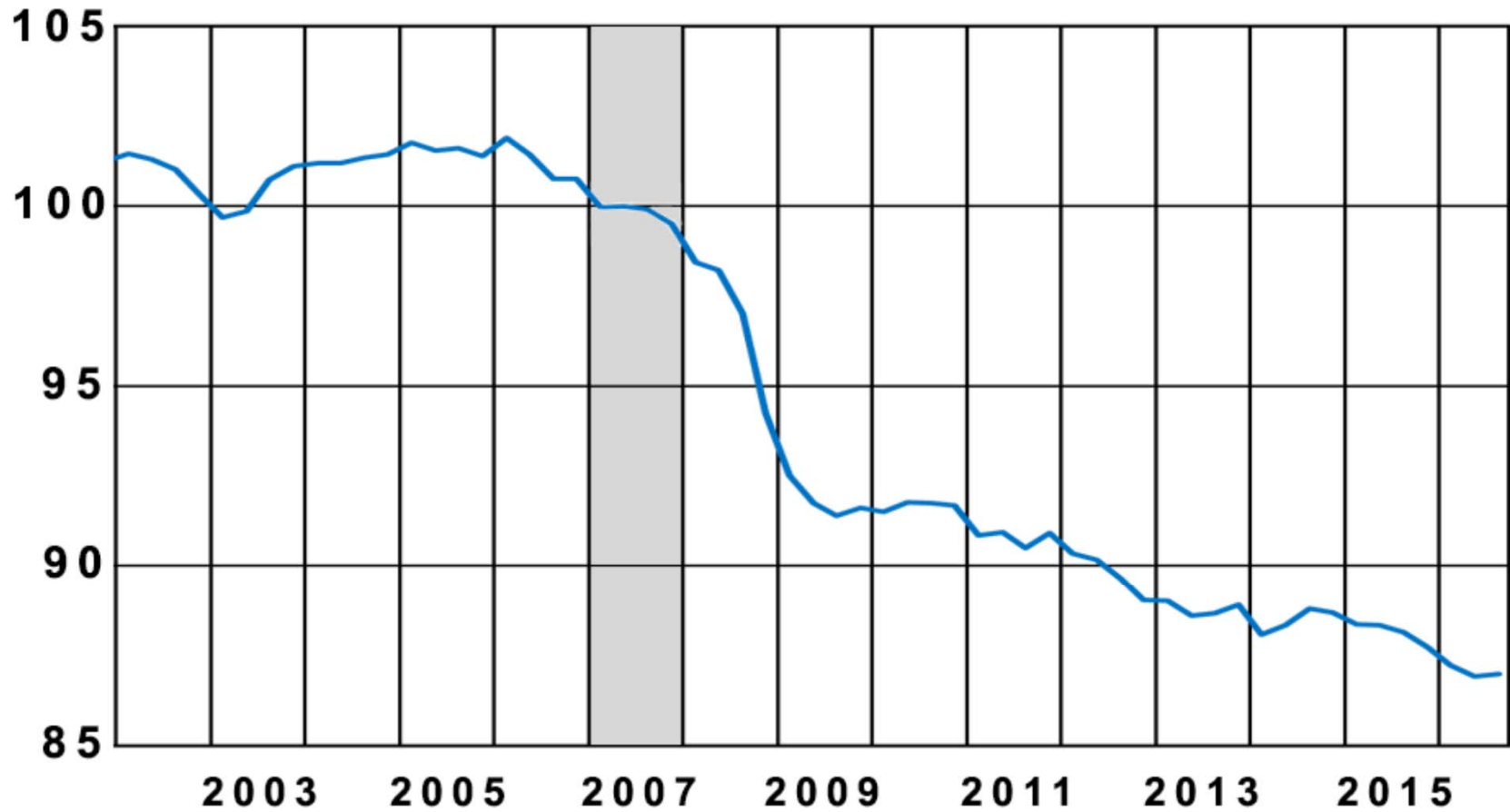


Note: Hours worked is seasonally adjusted. Military personnel are included.

Real Per Capita GDP Statistics Say: Falling Deeper into Depression

- Depression and prosperity are relative terms
- GDP per capita is falling relative to pre-2008 growth path

US Detrended Real Per Capita GDP 2002-2016



Thesis: Real per Capita GDP is Falling Because of Measurement Problems

Real Output was Growing at Trend

- If right, the US economy has been on a balanced growth path for the last 5 years
- This path is over 10% below the pre-2008 growth path

Why CPS Hours are Reliable

- 60,000 Households are surveyed every month
- Household members are asked whether they worked in the survey week and, if so, how many hours they actually worked
- This gets at the fundamental issue of the time allocation between the business and the household sectors

- Unlike GDP statistics they are subject to almost no revisions
- If you want to know how the economy is doing, look at fraction of civilian population employed and the average hours worked per employed person.
- These statistics for the previous month are reported the first Friday of every month

- Job numbers do not provide a good measure of how many hours worked
- There are ten million proprietors who work, but do not have a job.
- There are other problems with using job statistics to measure hours worked

Why Real GDP Growth Rates are Less than Real Output Growth Rates in Recent Years

- There are secular reasons
- There are cyclical reasons

Secular Factors Result in Real GDP Under Measuring Output

- The Nordhaus (1996) paper, “Do Real-Output and Real-Wage Measures Capture Reality? The History of Lighting Suggests Not”, is a classic.
- There is a measure of lighting output that is based on physical measurement

The Lighting Measure is Lumen-Hours

- A lumen is the intensity of light. With twice as many lumens there is twice as much light
- From 1800-1996 he calculates the labor price of 1,000 lumen hours
- The conventional price increased by 1,000 times the true price

- Nordhaus had a good measure of lighting output
- What about measuring the output of medical services?
- There is no direct measure like lumen-hours

Conventional Measure of Medical Services Output

1. The national accounts measure the nominal value of the inputs to the production
2. This gives the nominal value of output
3. A price is needed to convert nominal output to real output

1. The national accountants assume no technical change, that is, assume there is no “quality” improvement.
2. If doctor’s time were the only input, this means the price of output is proportional to the price of doctor’s time.
3. Everyone agrees there have been quality improvements. The micro evidence is overwhelming.

Daniel Lawver Figured Out a Way to Measure this Improvement

- He as a graduate student was so far ahead of the profession that his work has been ignored
- I was the first to recognize his genius
- His papers are difficult to read because a good language has not yet been developed

Lawver's Major Finding

- In the 1995-2007 period the true price of medical consumption relative to non-medical consumption fell by 30%
- The reason the share of medical consumption increased by 15% in this period was that the quantity of medical service increased 30%
- Key in his measurement is the effect of medical services on survival probabilities and how much people valued this increase

- The problem of lifestyle being every bit or more important in determining survival probabilities was dealt with
- He had a panel of birth-year cohorts and for each cohort used an aggregate household construct

- The survival probabilities being endogenous resulted in the utility function being determined up to a positive constant
- This permitted the marginal rate of substitution between medical and non-medical consumptions to be determined
- Utility functions with different multiplicative constant have the same MRS
- This in turn permitted the determination of real medical output

- The better measurement implied the more rapid improvement in the quality of medical services increased real output growth by 0.3 percent a year in the 1995-2007 period
- This is a big part of the purported productivity slowdown
- The life cycle of new products has been falling and easily accounts for the rest of the slowdown

Cyclical Factors Result in Real GDP Under Measuring Output

- Cyclical fluctuations are associated with the transition from one growth path to another associated with a policy regime change and with technological change

Question: Is the US economy about to experience an artificial intelligence (AI) boom like the dot-com boom in the last half of the 1990s?

There are Remarkable Similarities

- People are working more hours with much of the increase being in occupations that play a major role in starting up new businesses to exploit the technology advances
- Corporate profit share of national income low
- Value of corporations relative to accounting profits were high
- GDP per hour worked was low

Normally in Booms

- Profit share of income is high, not low
- GDP per hour is high, not low

The Reason

- In fact, output was high, economic profits share high
- Intangible investment was abnormally high relative to measured output (GDP)
- Intangible investments being expensed and being significantly bigger is the reason

Supporting Evidence

- MBA students dropping out to start businesses
- R&D investments to GDP increased (NSF study)
- Value of corporations (FOF statistics) relative to GDP was high
- There was biased technological change towards intangible capital investment

Scientist and Engineers

- They made Clinton's administration look good in the 1995-1999 period prior to the large recession that occurred starting at the beginning of 2000
- I predict they will make Trump's administration look better than it would otherwise

Concluding Comment

Times are good and getting better at an increasing rate

The frustrating thing is keeping up with the changes

My experience with new cars is that they are becoming more user-friendly in the last couple of years