

**Comments on “Technology
Optimism” by Baily and
Manyika**

Robert J. Gordon

Northwestern University, NBER, CEPR

San Diego AEA Session, January 4, 2012

Ambiguity: Technology Optimism but Uncertainty About E and Y Growth

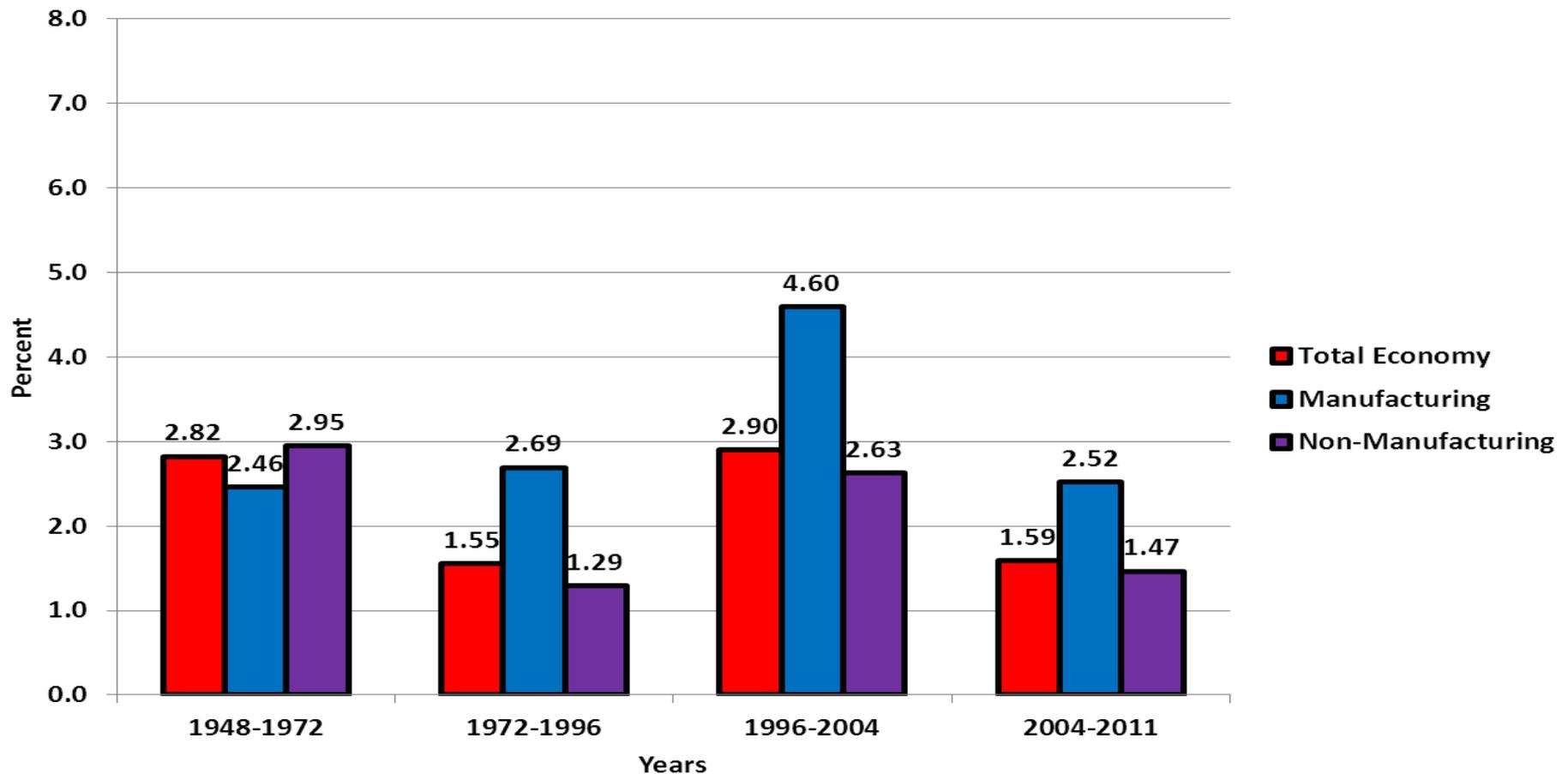
- There has been a lot of attention to my “End of Growth” pessimism about the U. S.
- Yet the authors’ conclusion is not far from mine.
- The problem is: it is possible to be very optimistic about the future of *manufacturing productivity growth* while *very pessimistic about growth of income per capita and especially consumption per capita in the bottom 99% of the income distribution*

Optimism About Productivity Growth in Manufacturing

- **My bar charts divide the postwar into four periods: 1948-72, 1972-96, 1996-2004, and 2004-12**
- **To understand the optimism about manufacturing, we compare total economy productivity (Y/H) with that in manufacturing and nonmanufacturing.**
- **Subsequently we compare Y/H and Y/N going back to 1891 for the total economy, but with the same postwar break points**

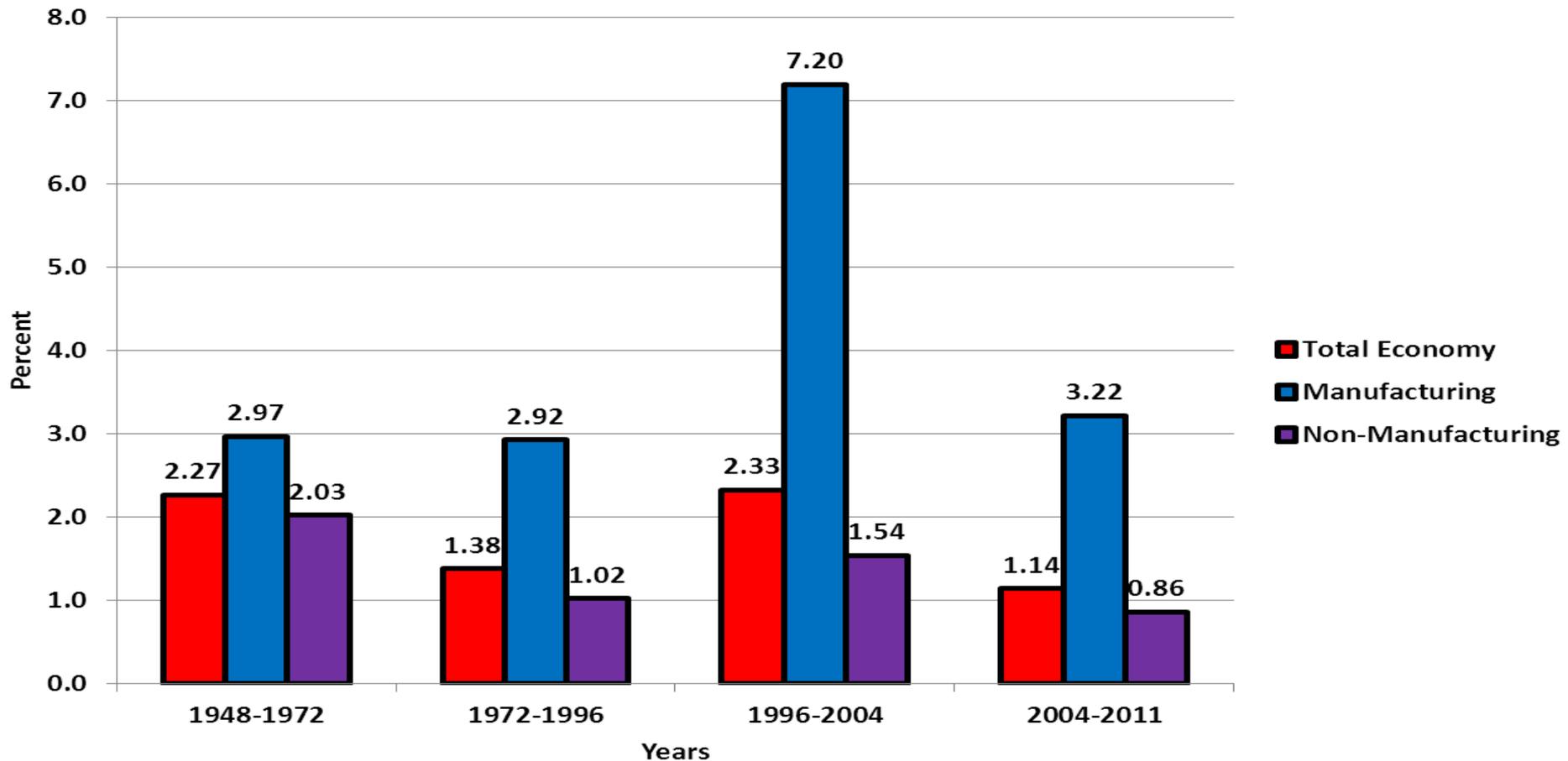
Y/H Growth: Total Economy, Manufacturing, Nonmanufacturing

Figure 1: Annualized Growth Rates of Output per Hour; Total Economy and Selected Sectors, BLS Data



Same with BEA Data on Real Value Added and Hours, Same Scale

Figure 2: Annualized Growth Rates of Output per Hour; Total Economy and Selected Sectors, BEA Data



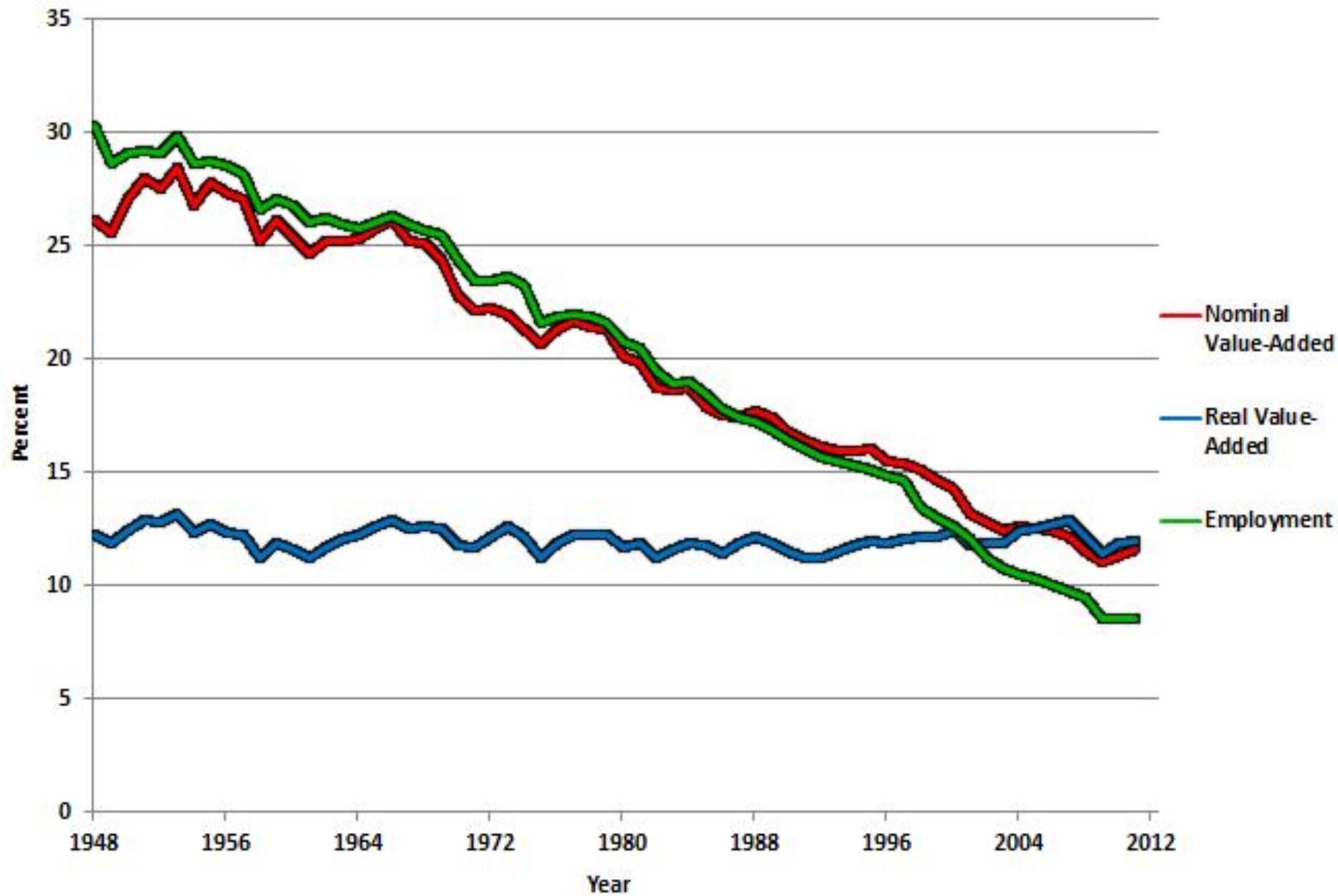
Interpretation

- **BEA and BLS Agree:**
 - 1996-2004 was a historical aberration
 - 2004-2012 looks just like 1972-96, which we often call the “dismal” slowdown period
 - Manufacturing productivity growth 2004-2012 was as rapid as in 1948-72
- **This nation has many problems, but manufacturing productivity growth is not one of them**
- **Bring on your army of small robots; but remember Krugman. What matters is who owns the robots.**

Why Manufacturing Won't Save Us: It is Gradually Disappearing

- **In our national accounts, the impact of growth rates in a given sector depend on its share in nominal value added**
- **As a creator of jobs, the role of manufacturing is expressed by its share of total employment**
- **Both the nominal VA share and employment share of the manufacturing sector have been falling fast and are now respectively 12 and 8 percent.**

Figure 13: Manufacturing Share of GDP, Various Measures, 1948-2011



Summary of Uncertainty About Nonmanufacturing

- BLS says 2004-12 = 1.47, up from 1.29 in 1972-96 **but half of 2.95 in 1948-72**
- BEA says 2004-12 = 0.86, down from 1.02 in 1972-96 **but less than half of 2.03 in 1948-72**
- Our productivity problem is in nonmanufacturing and evokes Zvi Griliches' "hard to measure" 1994 AEA Presidential Address

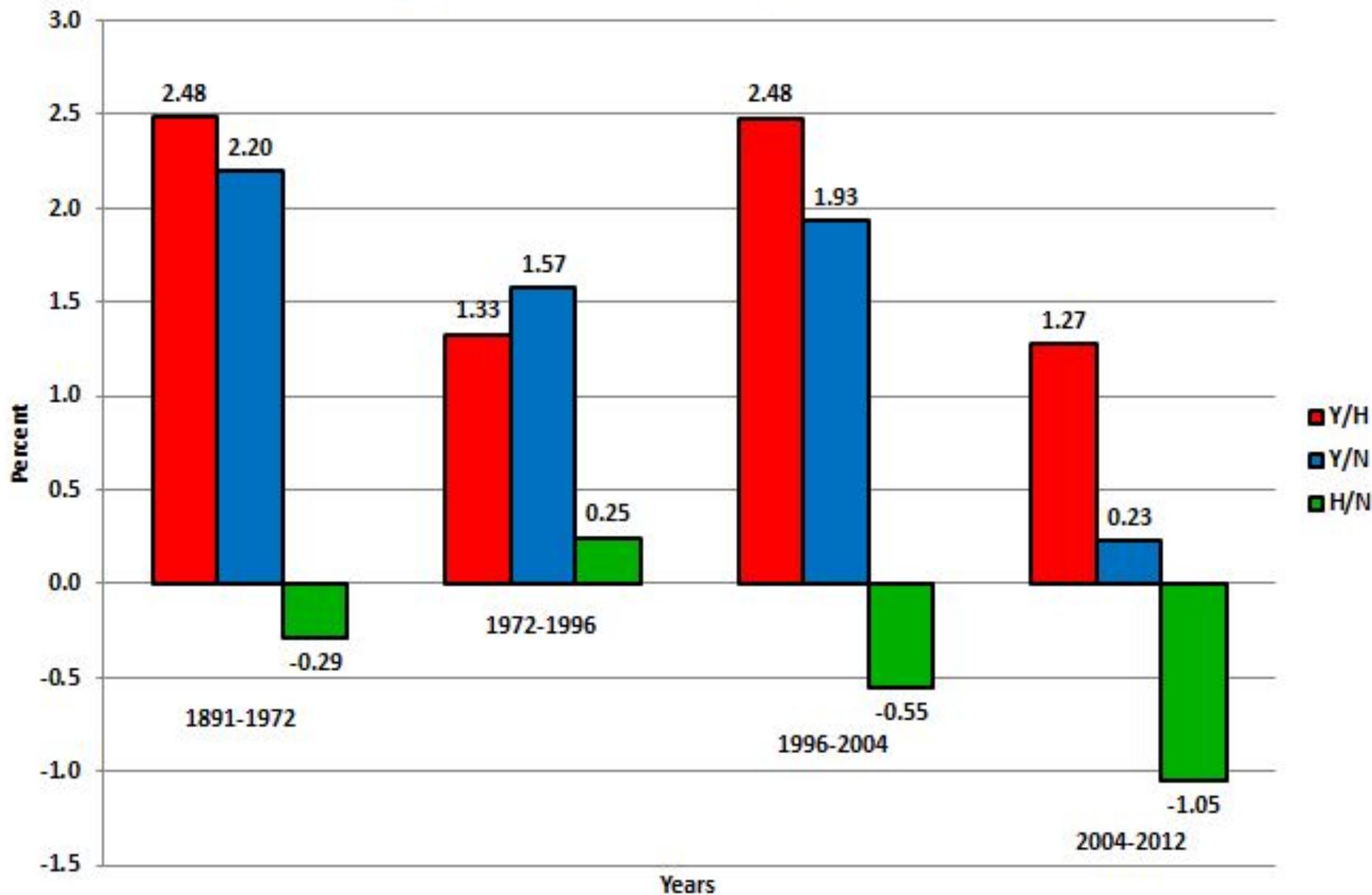
The Total Economy, 1891-2012, for both Y/H and Y/N

- Central Identity: $Y/N \equiv Y/H * H/N$
- Throughout most of history, H/N declined as economic agents chose to enjoy higher Y/N in part as leisure, shorter hours, longer vacations.
- The big exception was 1972-96, dominated by female entry into the labor force, which raised H/N and partially buffered Y/N from the Y/H slowdown
- Relative optimism about productivity (Y/H) in the last decade is tempered by the dismal performance of H/N .

2.0 Anchors Our Thinking

- **Real GDP per capita grew at 2.02 percent between 1891 and 2007.**
 - 2.20 for Y/H, -0.18 for H/N.
- **In my interpretation the 2.0 was propelled by the 2nd industrial revolution and all its spinoffs, 1891-1972**
- **Then the early decades of the computer revolution (IR #3), replaced many dreary clerical tasks by computer-related machines**
- **My prediction is that over the next few decades that 2.0 number falls to 1.0, and to 0.5 for the bottom 99%**

Figure 16: Annualized Growth Rates of Output per Hour, Output per Capita, and Hours per Capita, 1891-2012



The Authors Agree: Growth in Output per Capita is Grinding to a Halt

- **The paper's initial slide shows projected 40-year increases in real per-capita GDP (Y/N)**
- **Birth year 1960: 2.33 percent per year**
- **Birth year 2000: 1.22 percent per year**
- **This is close enough to my pessimistic view that I can adopt Baily and Manyika as teammates.**

There are Many Reasons to be Pessimistic About Future Y/N Growth

- **There are at least 7, but here I'll focus on only three**
- **Demography, Education, and Inequality**
- **Why have hours per capita grown so slowly?**
 - **Decline of 7% 2000-2004, no recovery, further decline of 8% 2004-2012**
 - **Baby-boom retirement**
 - **“The Missing Fifth”; Charles Murray’s “Fishtown”**
 - **Youth entering higher education but then dropping out, especially at community colleges**

Figure 18: Hours per Capita, 1992:Q1-2012:Q3

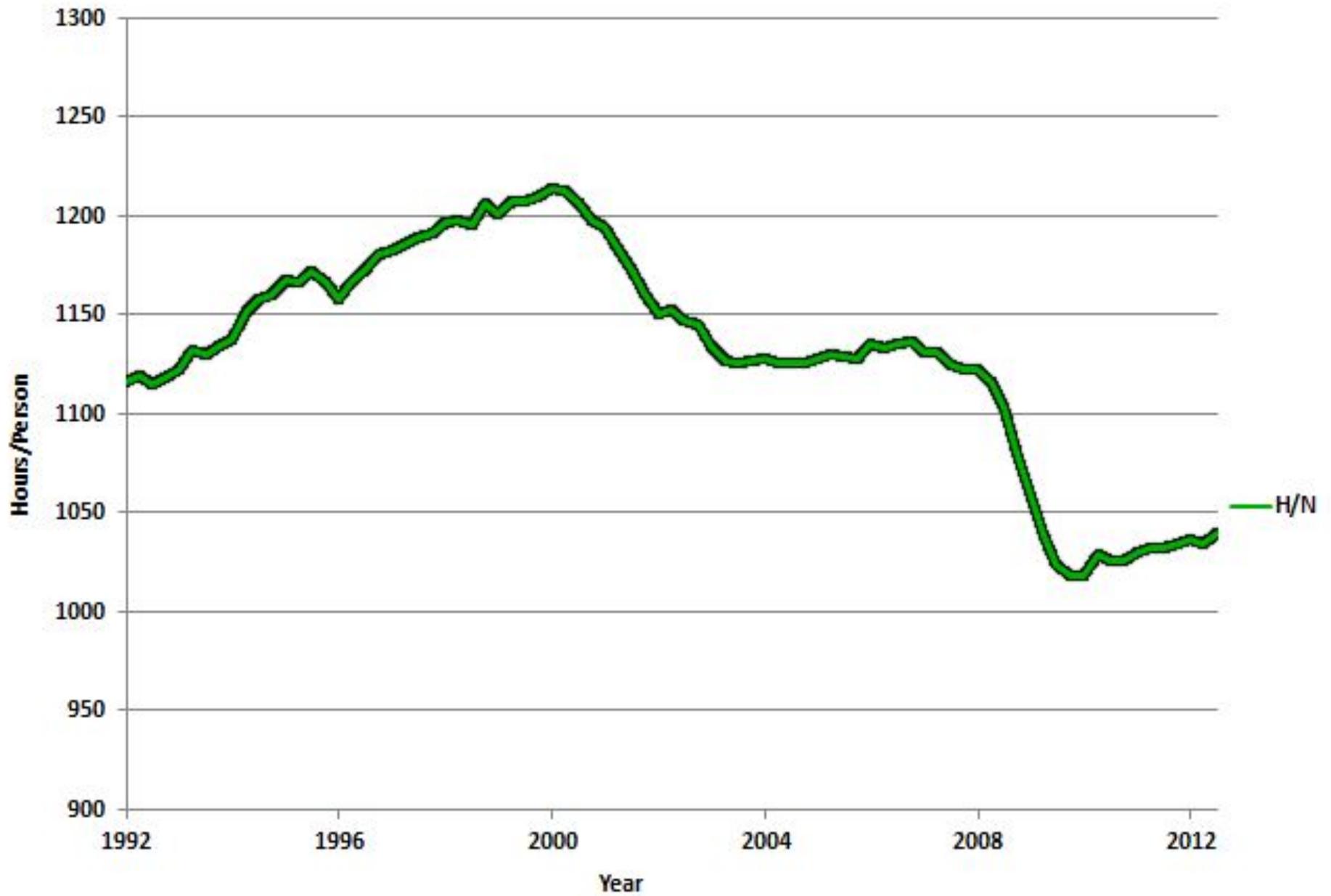
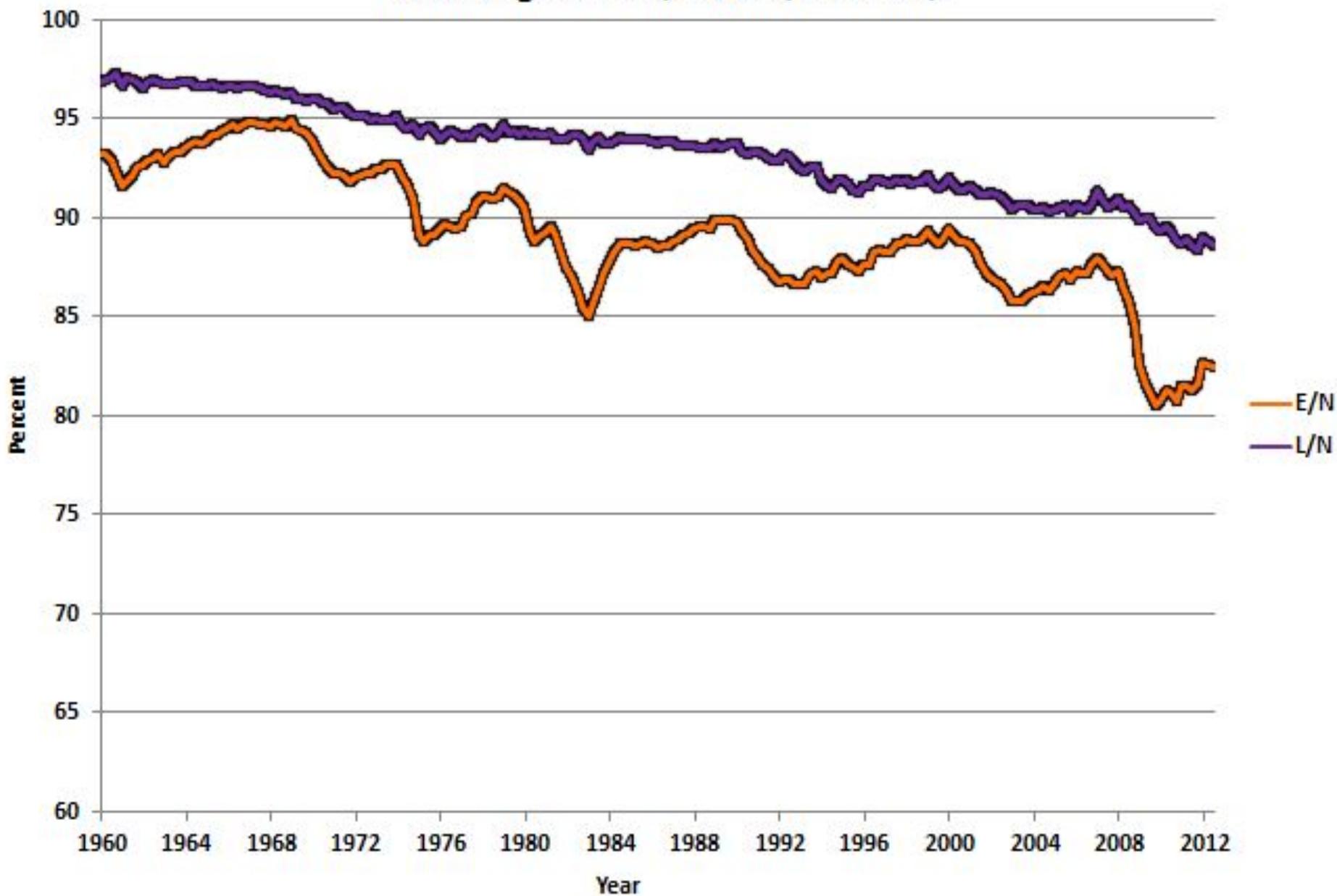


Figure 20: Employment per Capita and Labor Force Participation Rate, Males Ages 25-54, 1960:Q1-2012:Q3



The Dismal State of American Education

- Tertiary education completion among 25-34 year olds: U.S. 41%, Canada 56%
- \$1 trillion in student debt
- U.S. ranked #21 of #26 OECD countries in high school graduation rates
- 85% of foreign exchange students say that their American high school classes are much easier than in their native countries
- The black-white gap has not narrowed since the 1960s and the social negatives of the bottom 30% of the white income distribution (Murray's Fishtown) are at levels chronicled in the 1965 Moynihan report.

The Stark Saez Statistics on Inequality

- 1993-2008: **AVERAGE** real income growth = 1.3 percent per year.
- Same period: same concept for the bottom 99% grew at 0.75 percent a year.
- There is no reason why this increase in inequality will not continue for the same reasons as before
- This is why I mark down my forecast of 1.0 percent future Y/N growth to 0.5 percent for the bottom 99%

Conclusions

- **All this talk about small robots and “big data” is not going to save us.**
- **Productivity growth in manufacturing can continue to chug along at 3% (BEA) or 2.5% (BLS)**
- **But transition to the total economy for Y/H**
- **Then transition from Y/H to Y/N**
- **Run it through the six headwinds**
- **And we’ll be lucky to achieve growth in income per capita of the bottom 99% of 0.5% for decades into the future**