Productivity and Economic Growth in the Election Year and Beyond

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Forecasting Potential Output into the Future: Many Constituents

- Social Security: a 75-year Horizon
- Long-run Fiscal Policy: a 10-20 year Horizon
- Our Primary Focus Today: 20 years
- Global interactions
- Business investment decisions
Why Is Projecting Future Economic Growth a New Topic?

• Everyone Projects Productivity Growth and Adds +1

• Social Security “Crisis” is Based on Adding +0.2

• What is the Right Approach to Thinking About Future Productivity and Output Growth?
Long-range Forecasts Must be Based on the Past, but How Much of the Past?

- Productivity growth: do we look at the last 3 years, the last 8 years, or the last 30 years?
- Comparing a very noisy series with a very smooth series
  - The recent past of a smooth series might be enough
  - But a longer historical interval might be necessary for the noisy series
Can Pure Statistical Methods Handle Turning Points in Trends?

• Think of the mistakes we would have made making two-decade forecasts at these points in the past
  – In 1963: forecasting population growth
  – In 1968: forecasting productivity growth
  – In 1995: forecasting productivity growth again

• Not to mention 1929 and 1945!
For Long-range Forecasts, Our View of the Past Requires Cycle-free Trends

- We don’t want a cycle hiding inside a trend, the disadvantage of the H-P filter for some variables
- We may need different trending methods for some variables and eras
- Important example: productivity growth in the 1930s, 1940s
Hence We’ve Got to Talk About Cycles and Trends Together

• Today’s points of departure:
  – We want long-run forecasts
  – For this, we need the past
  – But we need somehow to filter the past to find out what is relevant for the future
  – Horizon into the past and detrending method may differ for each variable
Topical!
Especially since August 7,
Profound Puzzlement about Productivity Behavior

- Labor productivity growth mid-00 to end-03 of 3.64% p.a. dwarfs the 2.56% of 1995-mid 00.
- Yet the 1995-2000 revival has been strongly linked to the ICT investment boom.
- How could productivity growth accelerate after ICT investment crashed?
- Could the core explanation of the productivity growth revival rest in something other than ICT?
Organizational Tool for Both Cycles and Trends

• The Output Identity
• In its Simplest Form Makes Output Equal to the product of:
  – Productivity
  – Employment Rate
  – Labor-force Participation Rate
  – Working-age Population
  – Hours per Employee
• Hiding Inside the Output Identity are Numerous Useful Trend and Cyclical Relationships, including

  OKUN’s LAW
The Real-World Version of the Output Identity

\( q = p + h + e + f + n + m + s \)

By themselves, these symbols are logs of actual values.

With *, they are the trends of these variables.

With ‘, for each variable they are log ratios of actual to trend \( (x' = x - x^*) \)
Potential GDP vs. Productivity: the Trend Story in Tables 1 & 2

- Potential GDP growth ($\Delta q^*$) ranged from:
  - 4.07 in 1963-72 to 2.69 in 1978-87
  - Differences accounted for by
    - Productivity (peak 1954-63)
    - Population growth (peak 1972-78)
    - LFPR (peak 1972-78)
  - Offset by decline in hours/employee (peak 1972-78)
What does the Productivity Growth Trend Look Like?

• No Matter What the Method, Agreement that
  – Peak Growth in the Kennedy Years
  – Slowdown from mid-1960s to late 1970s
  – Recovery in early 1980s, mid 1990s, and a further recovery post-2000
The Implications for Deviations of Actual Productivity Growth from Trend

• Big Surprises

• So huge is the 2000-2003 Record that the Late 1990s Appear to be Below Trend

• My Contrition, tempered on Data Availability
Kalman filter with cyclical term

Average

H-P 6,400
Okun’s Law: Where is the Remaining Procyclical Effect?

- Table 3: Peak and trough ratios of actual to trend
- Employment Rate 39, Productivity 38, Hours 24, LFPR only 5, other -7
- Differences over cycles (LFPR, productivity)
• Log Ratio of Actual Real GDP to its Trend
Making a Long Story Short: Statistical Analysis

- Look at Figure 4, Compare Jobless Recovery of 1991-92 with that of 2002-03
- These are statistical residuals from the best possible attempt to explain the actual movements
What Has Been Going on in 2000-2003?

- Residuals much larger than 1991-92
- Employment rate no offset
- The Unprecedented Deviation between the Household Employment and Payroll Employment Totals
Why Did Productivity Growth Accelerate While ICT Investment Collapsed?

• The Collapse of Profits
  – NIPA vs. S&P
  – Accounting Scandals
  – Stock Option Compensation

• The Intangible Capital Hypothesis
Six Reasons Why 2000-03 Productivity Growth Should not be Extrapolated to 2023

• #1 The Early Recovery Productivity Bubble (see Table 8)
• #2 The Mismeasurement Hypothesis about Payroll Employment
• #3 Intangible Capital
• #4 For twenty years into the future, some weight should be given to 1972-95
The Last Two Reasons

• #5 Jorgenson-Ho-Stiroh on Labor Quality
  – 1995-2001 0.38 percent contribution
  – 2001-2011 0.16
  – 2011-2021 0.02

• #6 Europe Lags Behind. Does This Tell Us Anything?

• Guesstimate, stats say 3.2 for 2004, how about a range of 2.25-2.75, centered on 2.5?
Connecting the Past to the Future

• For Future Potential GDP Growth, we ignore employment rate, LFPR, and mix/employment measurement effects

• Focus on
  – Productivity growth
  – Population growth
  – Growth (shrinkage) in Hours/Employee
Population Growth

- **Fertility:** “American Exceptionalism”. Reasons for it to continue
  - Hispanic immigrants
  - Demographers and Phelps: Europe’s disfunctional youth culture

- **Mortality:** continued decline in death rates, but how fast?
  - Example of how far into the past we should look
  - Rate 1995-2000 only ¼ of 1968-82
The Wild Card: Immigration

- Figure 5: Continued Postwar Increase as Share of Population
- Growth Rate of Legal since 1970: 3.4%
- Trustee’s: absolute decline
- Only 1% growth rate in immigration will boost 2075 U. S. population from 415 million to 600 million
- Implies future population growth of 1%
Adding it All Up, Table 11

• Let’s Work Through the Table
• Implications for Social Security
• Time Sequence of When this is Going to Happen
Conclusions

• To project Potential GDP into the future, we need to understand the past
  – How much of the past is relevant?
  – Which movements of actual data in the past are reflected in trends, in “regular” cyclical movements, and residuals?
The Two Jobless Recoveries

• The 1991-92 Productivity Bubble can be largely explained (EoE effect)

• The 2002-03 Productivity Upsurge comes out as a residual despite 3.1% trend growth

• Will this residual go away? (residual collapsed and changed sign in 1993)
Translating the Past into the Future

• Six Reasons why 2000-03 Productivity Growth Won’t Continue
  – Next two decades, 2.5% NFPB, 2.00% total economy

• Population and hours per employee add 1% per year

• Total implied potential GDP growth, 3.28% in contrast to 2.95% 1987-2001