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

$(4)\ q\ =\ p + h + e + f + n + m + s$

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 $(x' = x - x^*)$

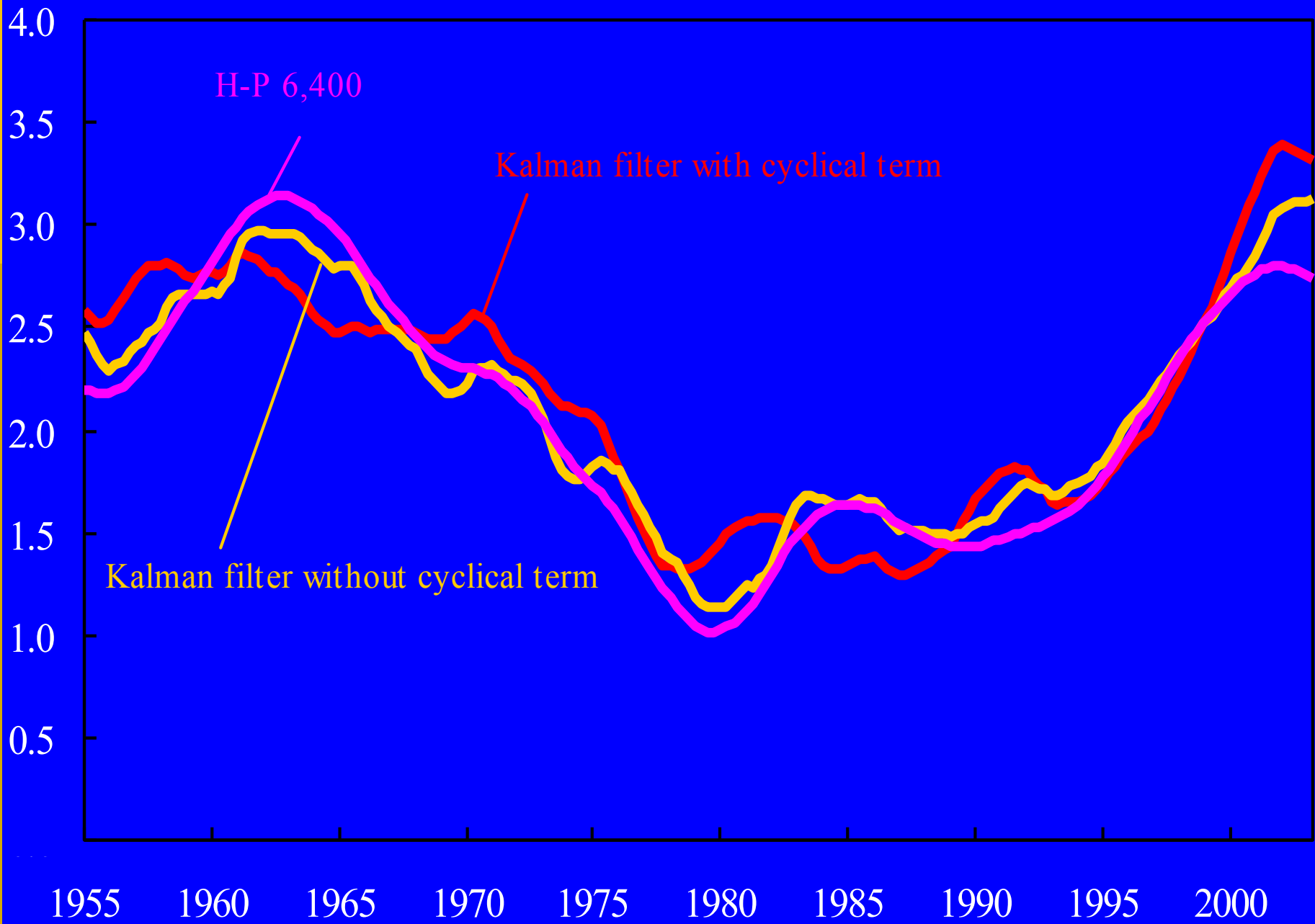# Potential GDP vs. Productivity: the Trend Story in Tables 1 & 2

- Potential GDP growth *(Δq*)* 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

H-P and Kalman Methods

Percent

H-P 6,400

Kalman filter with cyclical term

Kalman filter without cyclical term

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

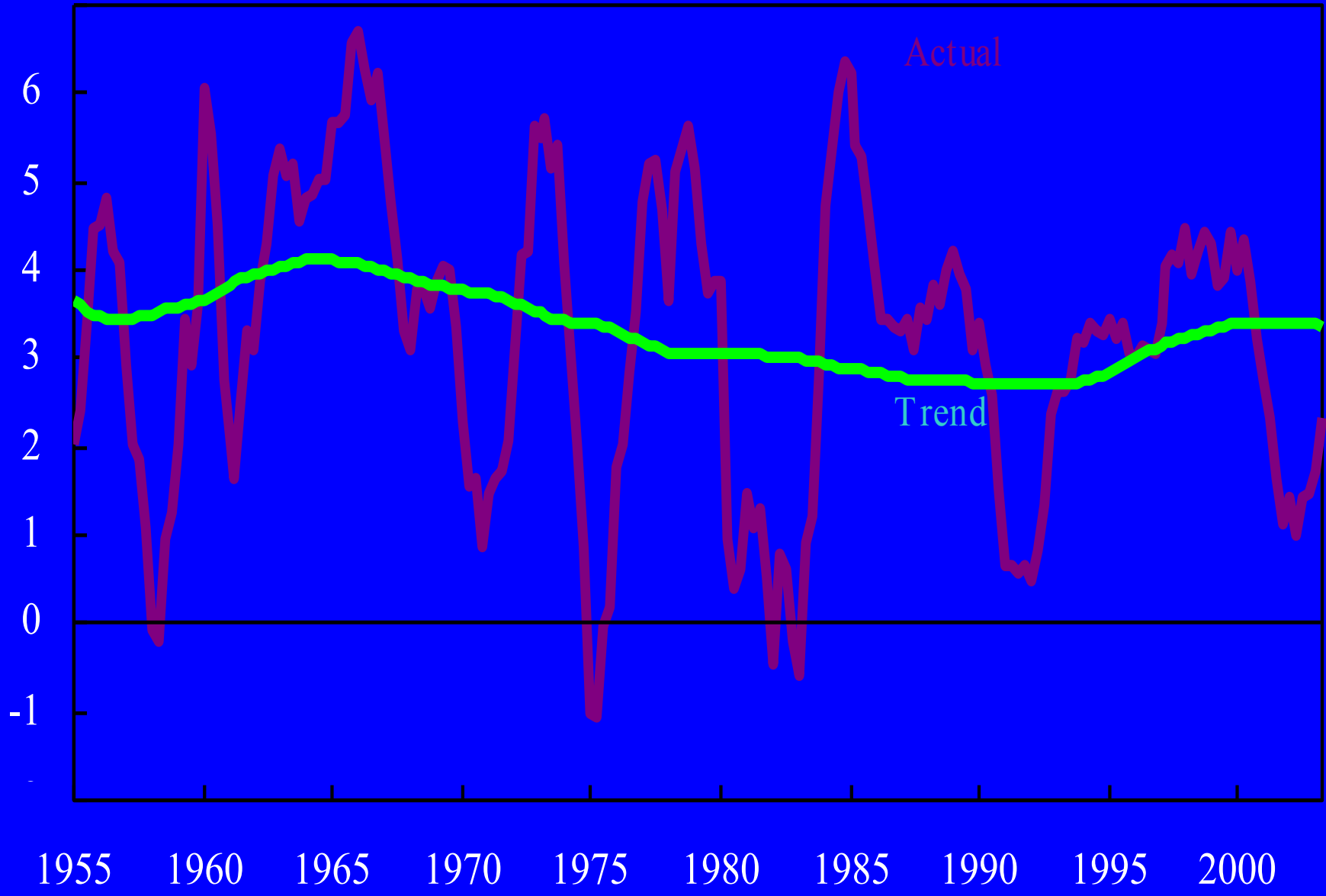- My Contrition, tempered on Data Availability
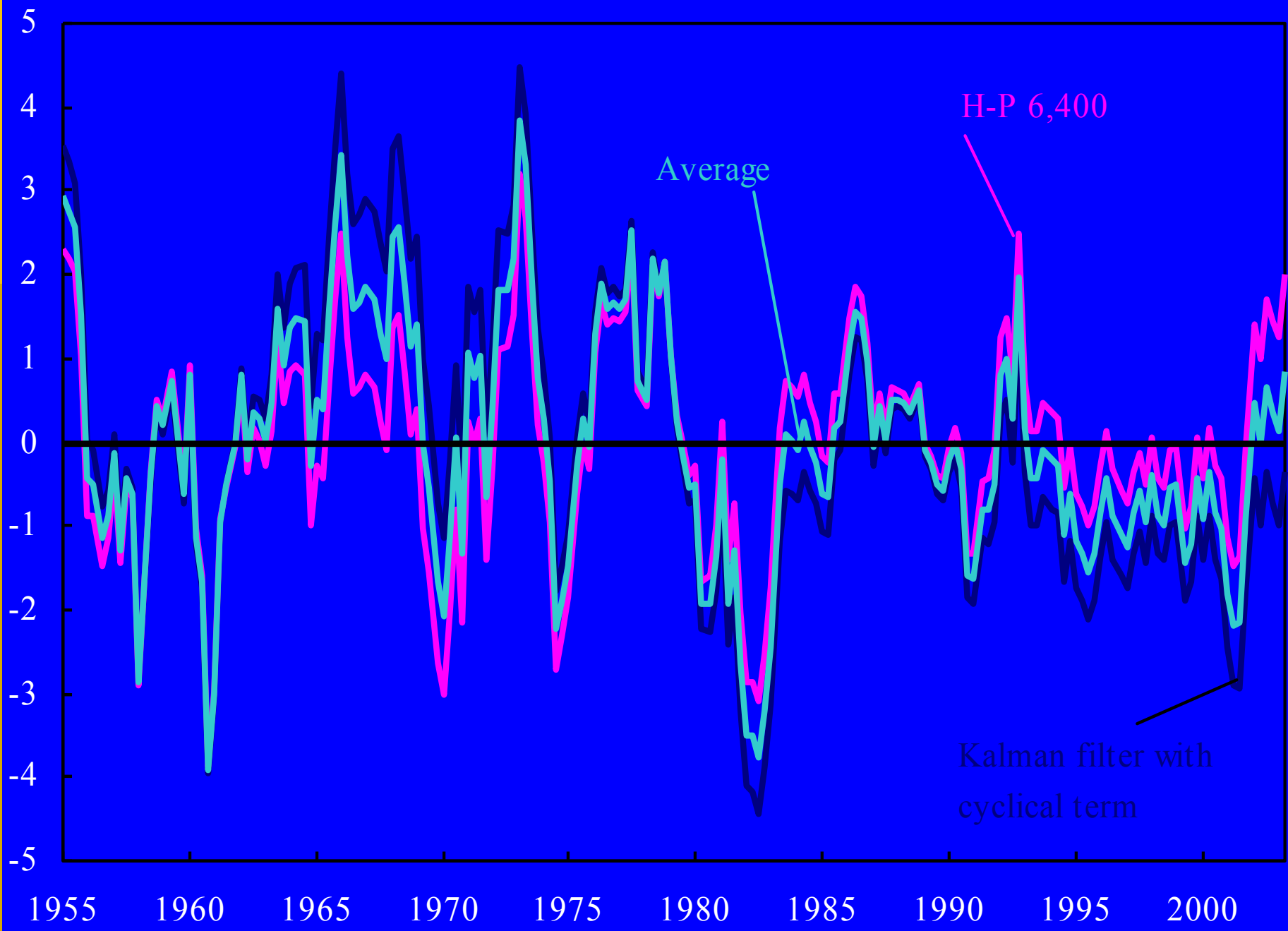
Okun's Law: Where is the Remaining Procyclical Effect?

- Table 3: Peak and trough ratios of actual to trend

- Employment Rate 39, Productivity 38, Hours 24, LFPR only 5, other -7
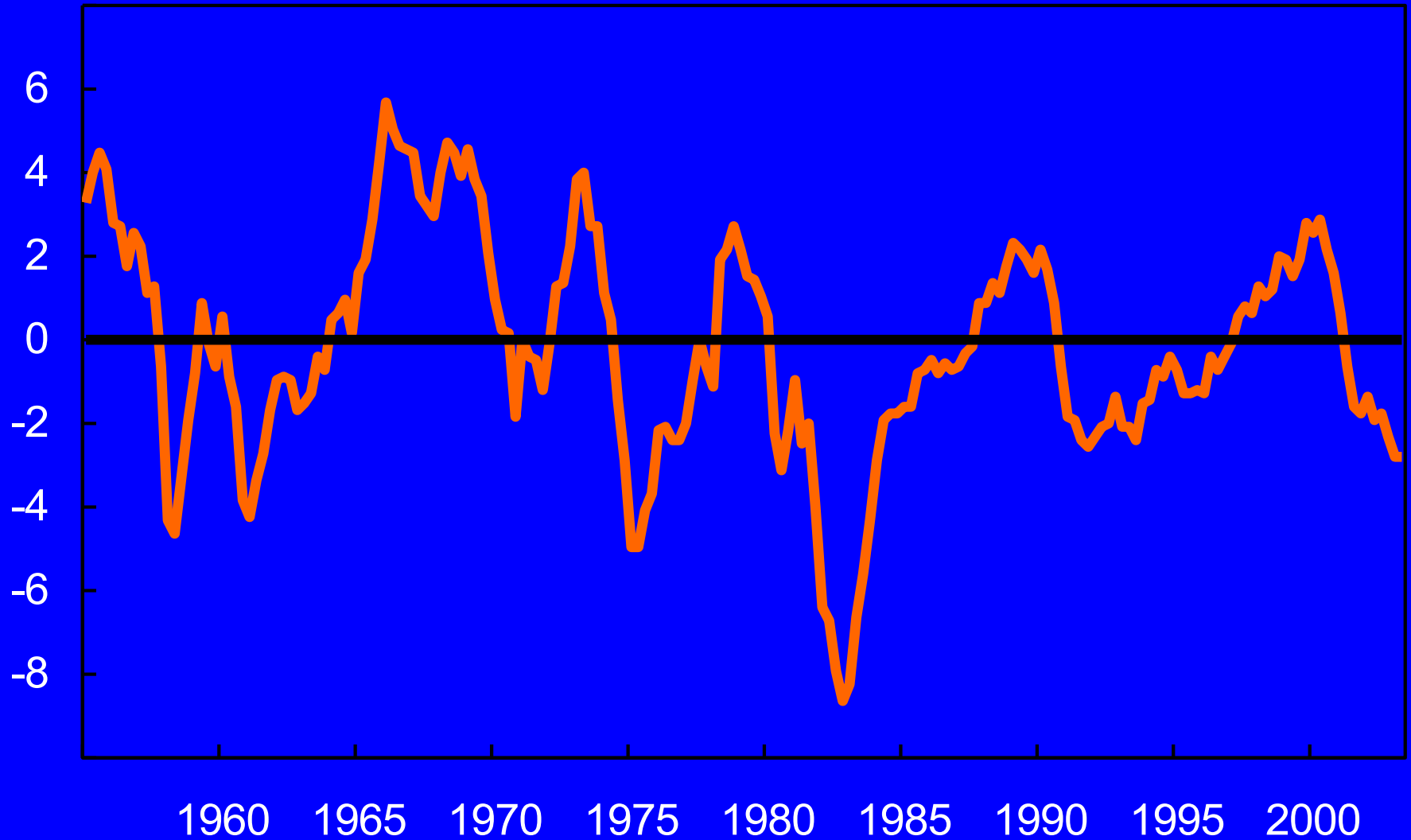
- Differences over cycles (LFPR, productivity)
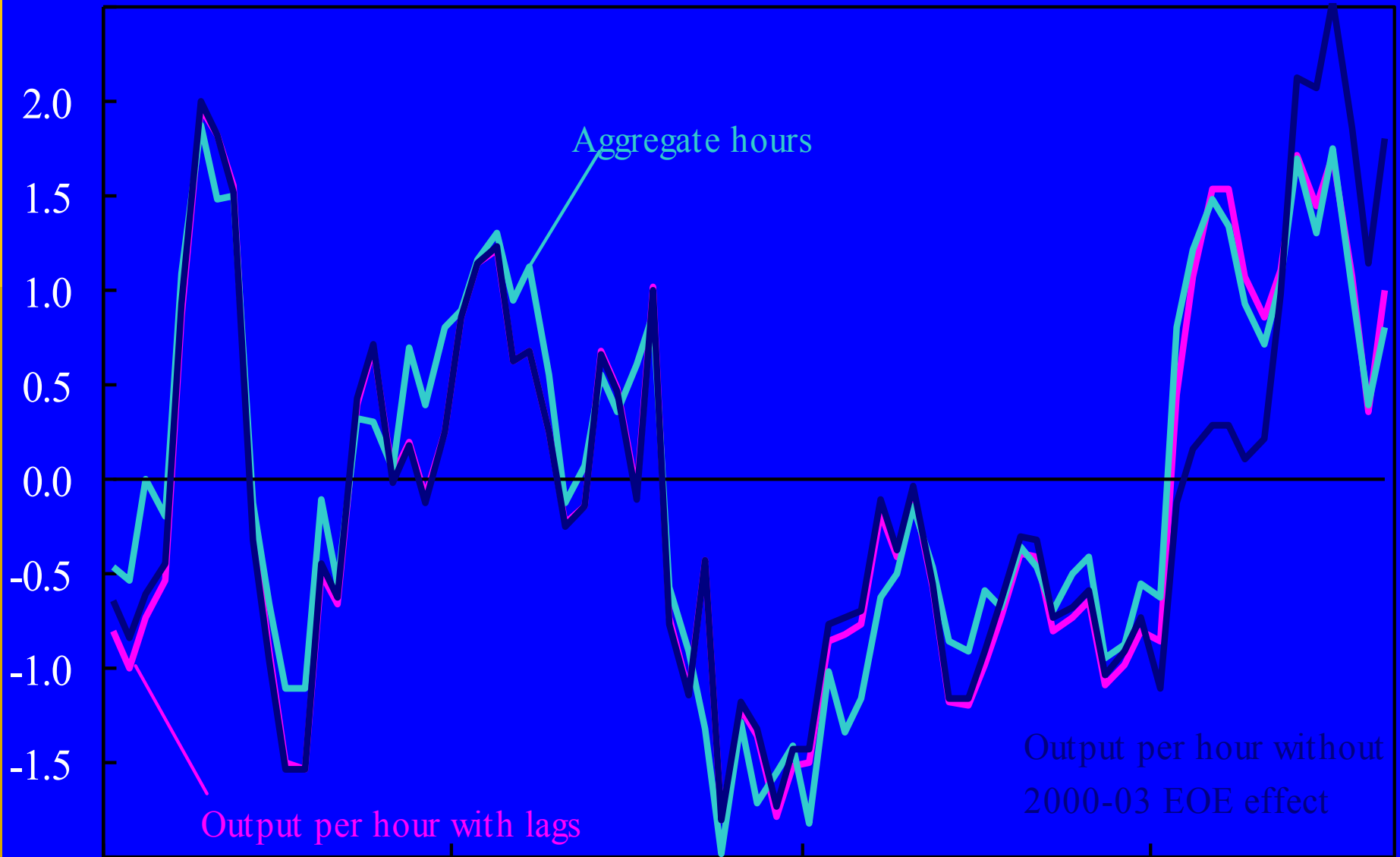
Actual and trend growth

•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%

Percent
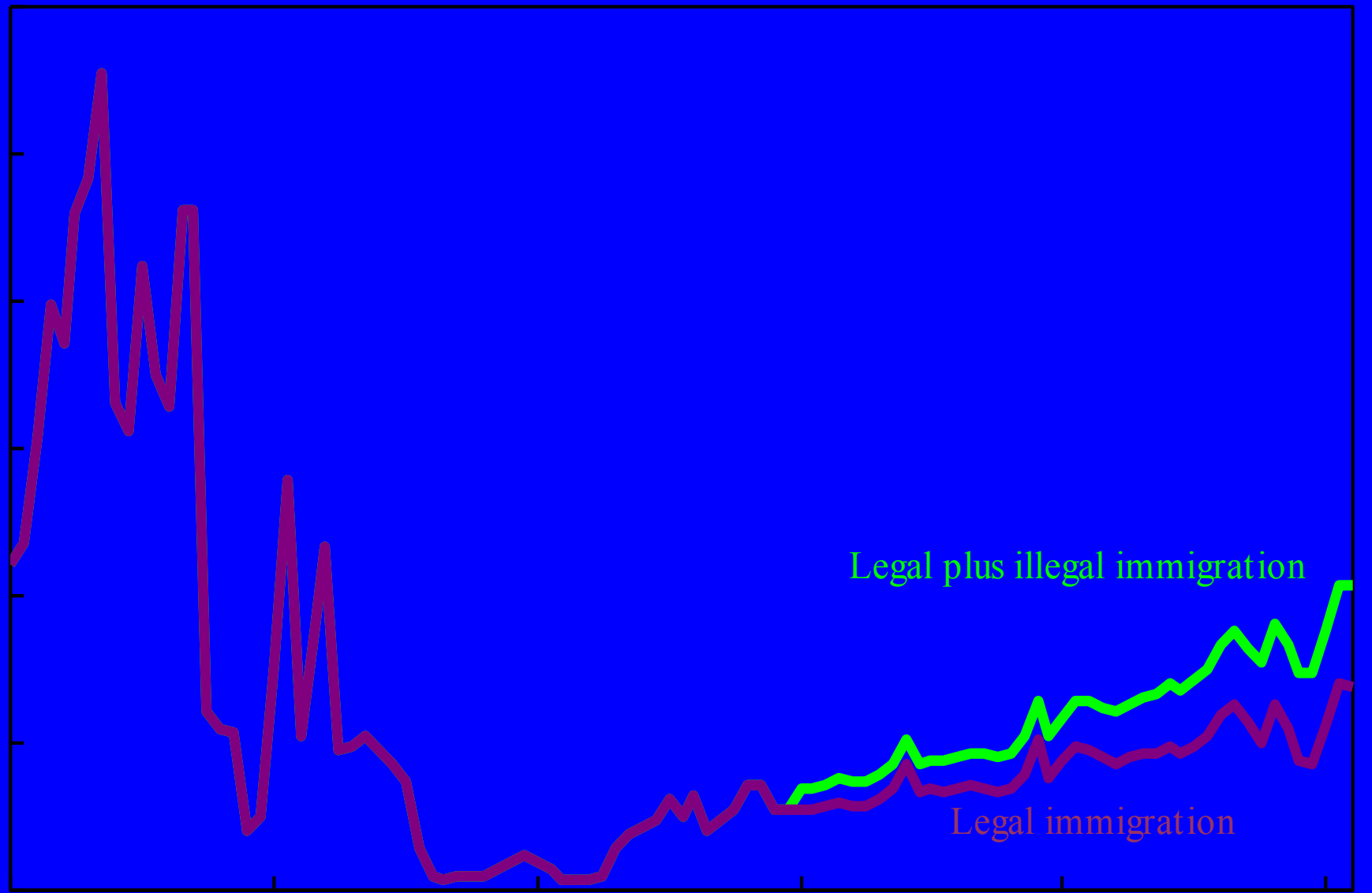
Legal plus illegal immigration

Legal immigration

1.0

0.8

0.6

0.4

0.2

1920   1940   1960   1980   2000

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