What Caused the Decline in U. S. Business Cycle Volatility?

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Instant Obsolescence in Macroeconomics

- Prosperity in 1960s bred conferences on "Is the Business Cycle Obsolete?"
- My 1984 conference came after the two large recessions of 1974-75 and 1981-82
- But on the day of the conference, the business cycle changed again, continuing the tradition of "instant obsolescence"
- No disputing the decline in volatility since 1984, but why?
  - Numerous participants in last week's Fed conference took it for granted that it was an achievement of monetary policy

Earlier Explanations of Postwar Stability Compared to pre-1929

- Increased share of government, higher tax base creates automatic stabilizers
- Less procyclicality of money supply
- FDIC, Other Financial Market Reforms

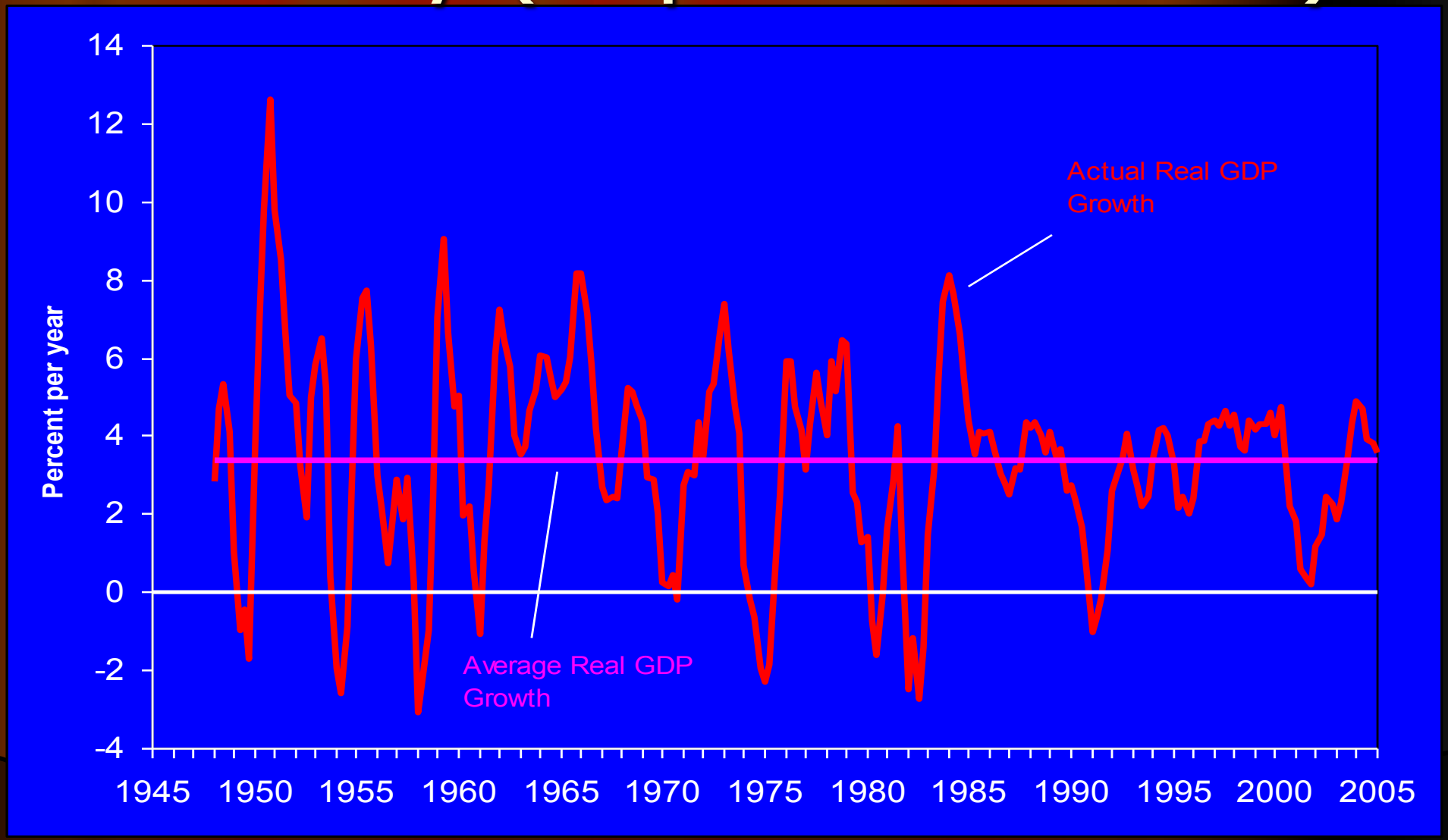
Stabilization *within* Postwar, before and after 1984

- Shocks
  - Demand shocks
    - Federal government now the culprit not the saviourFinancial and banking reforms
    - Inventory management
    - Financial Market Deregulation stabilized residential housing
  - Supply shocks, a main focus of this paper
- Improved monetary policy
- Of Lesser Importance
  - Shifts in shares to services

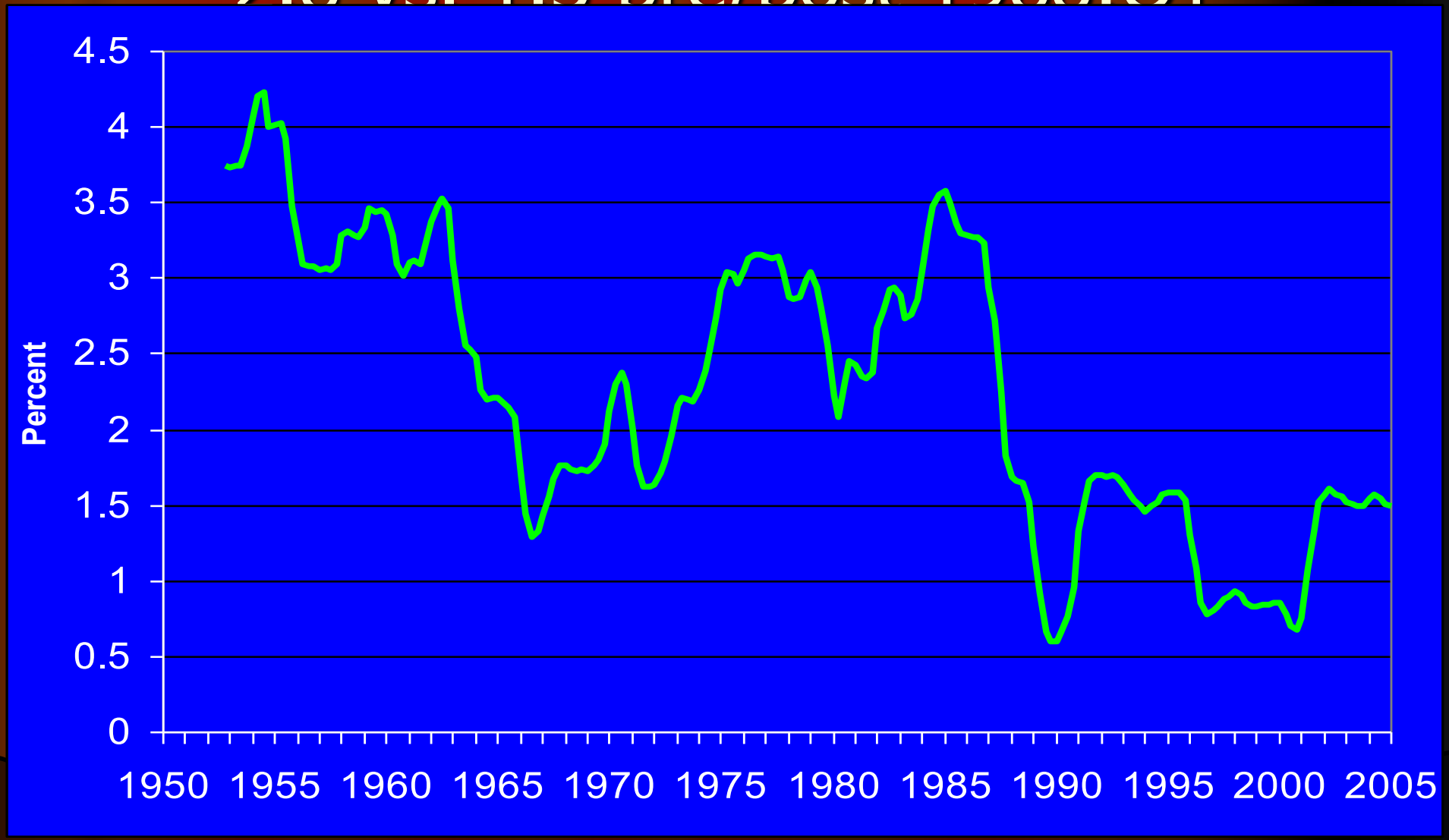
Preview of Paper

- Composition analysis across 11 components of spending on GDP
  - Role of composition shifts vs. reduction in within-sector volatility
  - Isolation of three sectors as most responsible for improved stability; support for demand shocks
- Building a three-equation macro model
  - Inflation, Taylor Rule, Change in Output Gap
  - In the spirit of Stock-Watson two papers, but a more explicit interpretation of the shocks and a surprising result about monetary policy

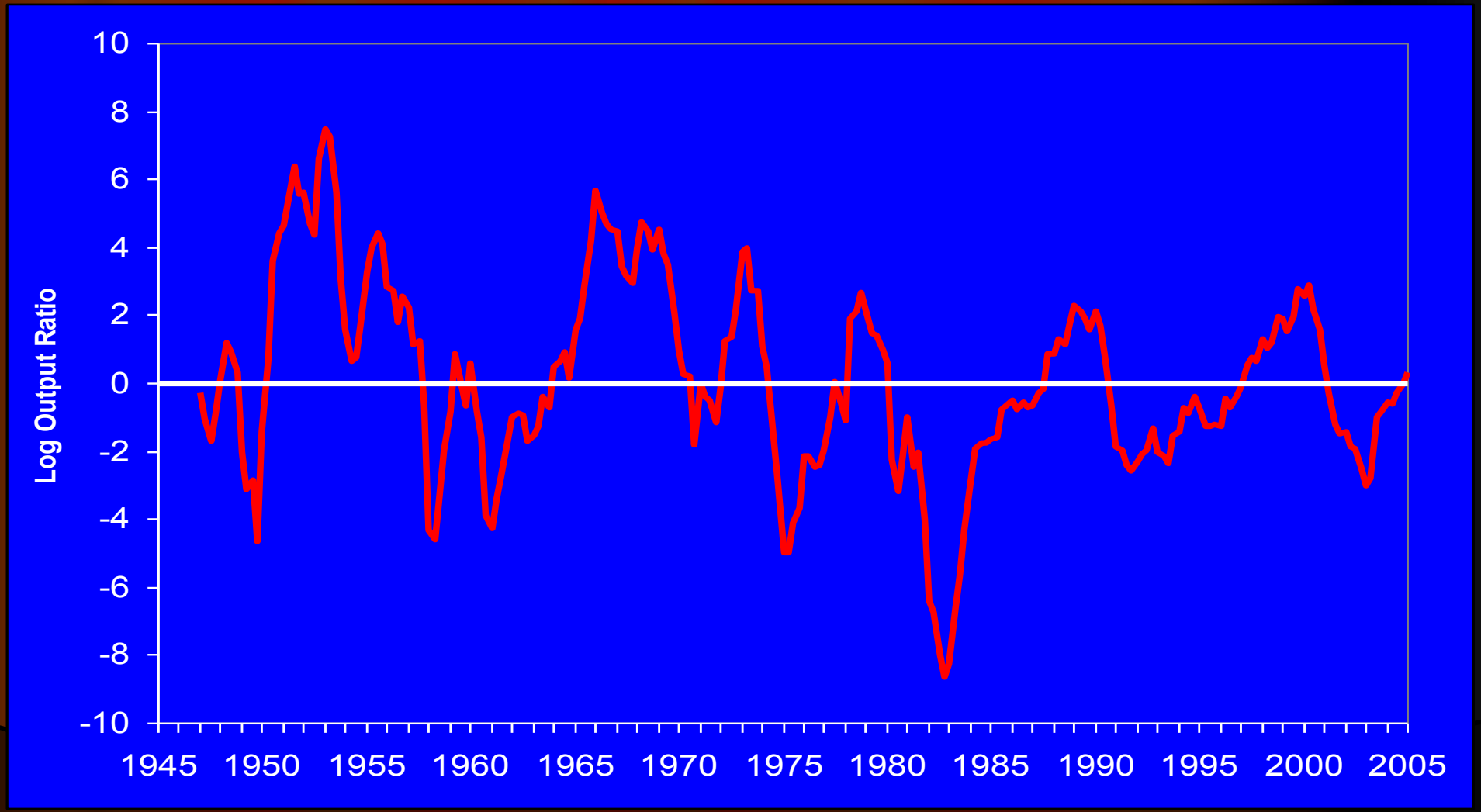
Initial Evidence on Reduced Volatility (4-qtr Δ Real GDP)



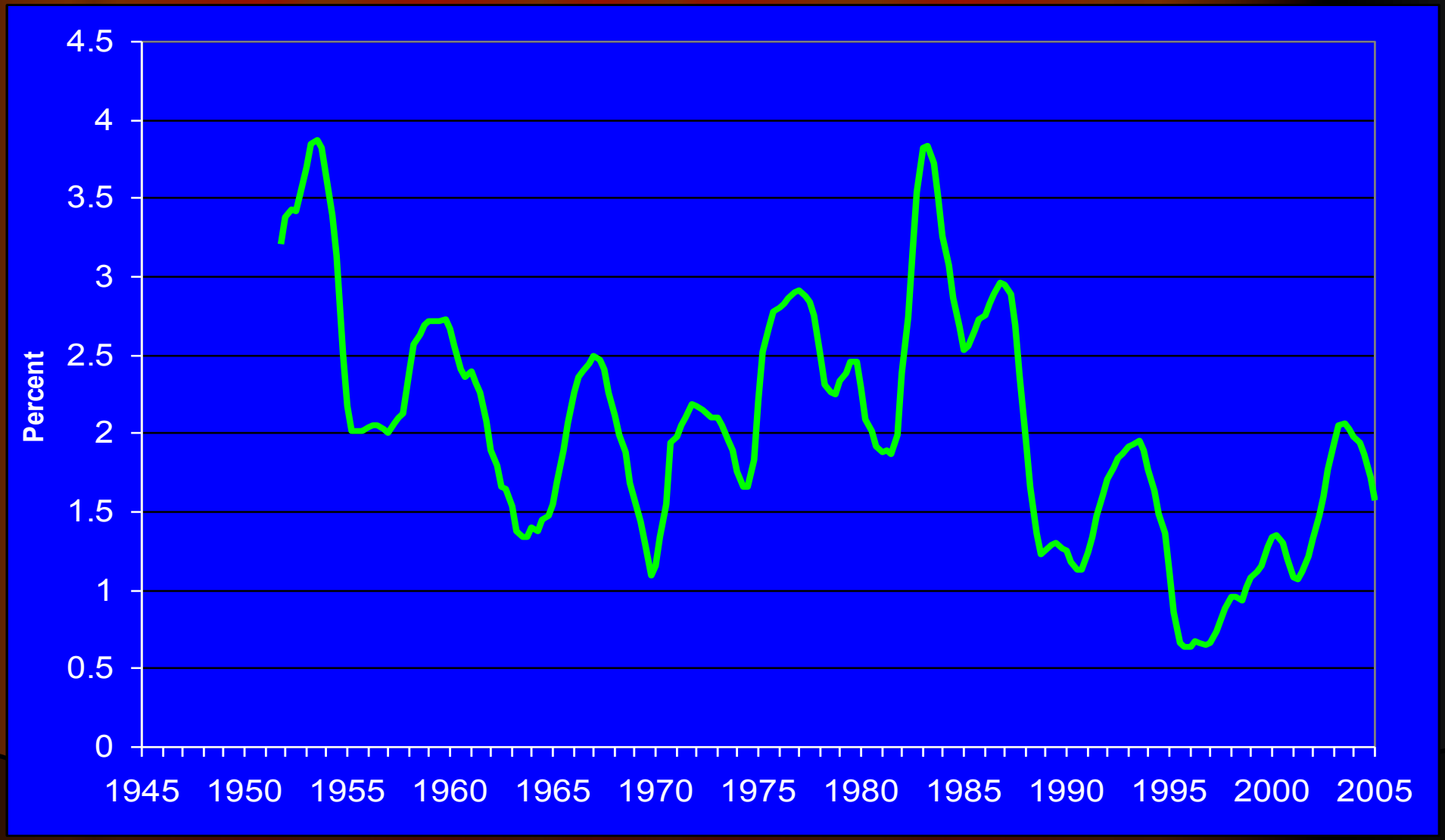
Rolling 20-quarter Standard Deviation of 4-qtr Δs in Real GDP, 2.8 vs. 1.3 pre/post 1988:Q1



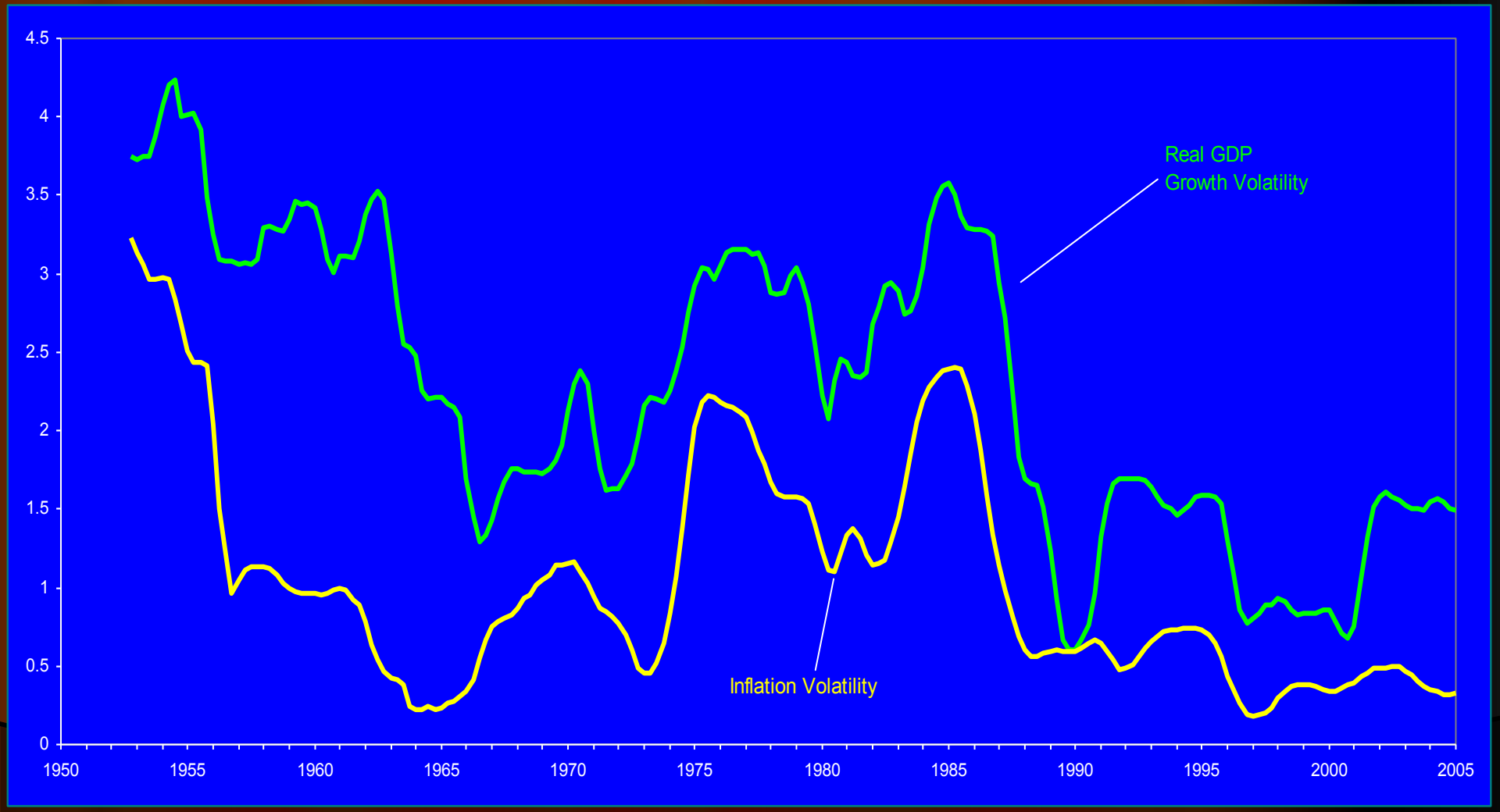
What About Changes in Natural Output Growth? A Better Criterion: the Output Gap



Stability Less Obvious but Still Significant, Decline 42% vs. 57%



Inflation vs. Output Volatility: Sometimes the Same, but Other Times Different



Turn to Tables for Decomposition Analysis

- Table 1: Standard Deviations and Shares of 11 Sectors
- Table 2: Effect of Shifts in Shares and Own-Sector Volatility
- Table 3: Contributions to GDP Change:
  - Emphasis on Residential Investment, Inventory Investment, and Federal Spending

Building the Three Equation Model

- Combines my “mainstream” or “triangle” approach to explaining inflation
  - Inertia
  - Demand through output or U gap
  - Specific supply shocks
- “Taylor Rule” equation for Fed Funds rate
  - Coefficients allowed to change, 1979 and 1990
- Output gap equation with feedback from interest rate changes

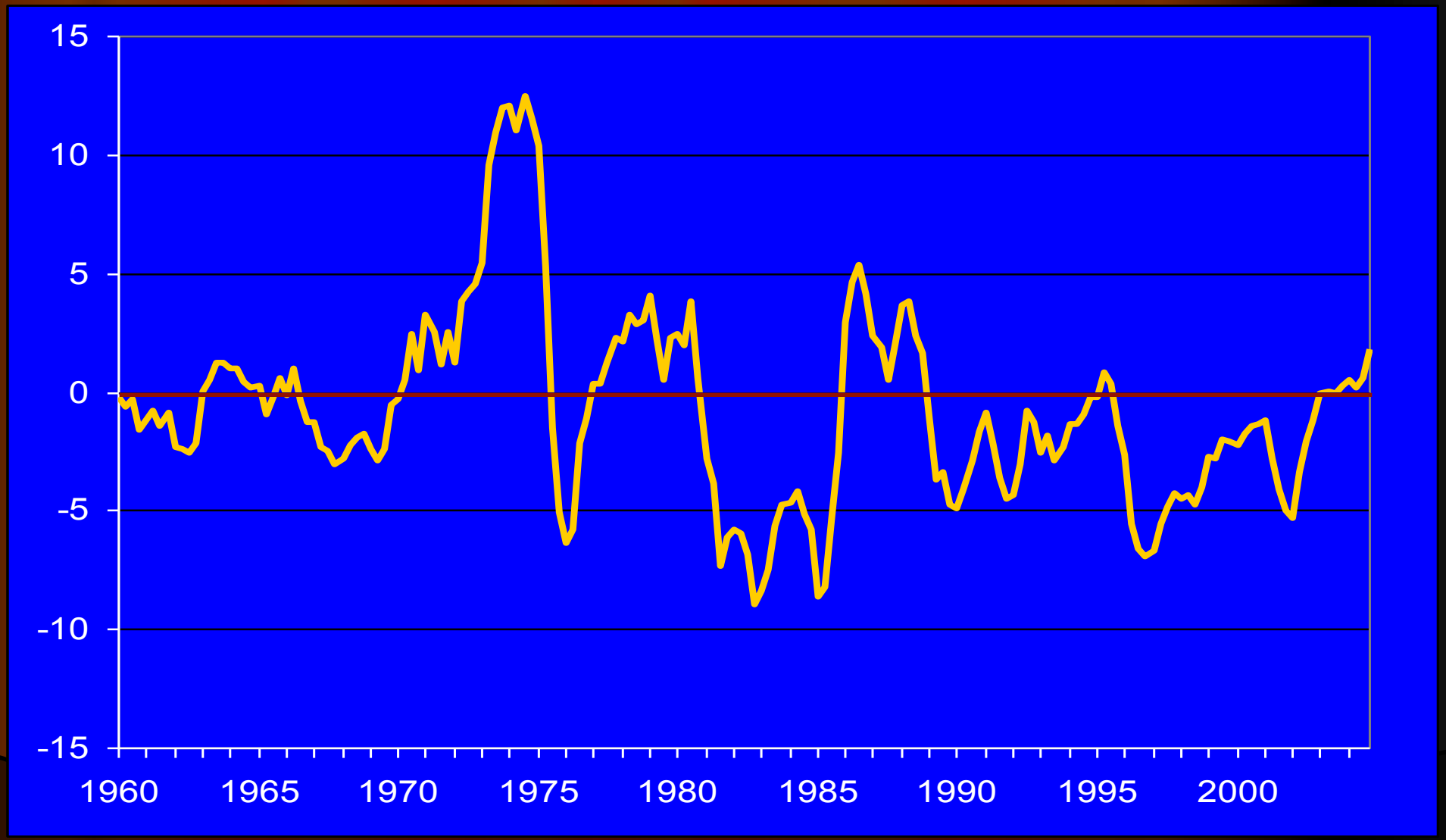
The Inflation Equation: the Distinguishing Features

- Long 24-quarter lags on past inflation
  - No pretense that these represent expectations – some unknown combination of expectations, wage contracts, price contracts
- Demand enters through the unemployment gap
  - Time-varying NAIRU estimated as part of equation estimation
  - "No-shock" concept of NAIRU

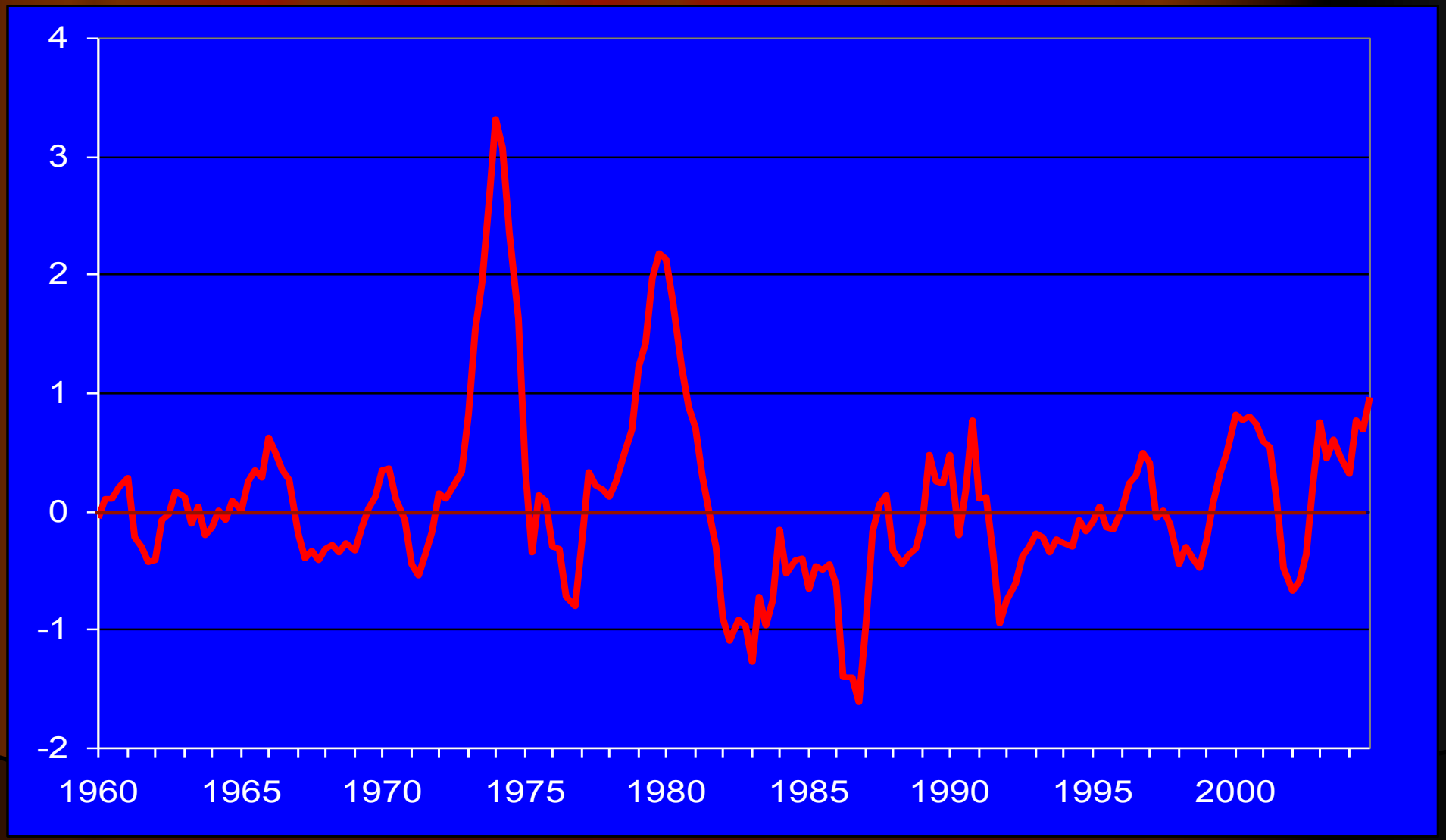
Supply-shock variables

- Changes in the relative price of imports
- The food-energy effect
- The medical care effect
- Acceleration and deceleration of the productivity growth trend
- Nixon-era controls, held down inflation in 1971-72, boosted inflation in 1974

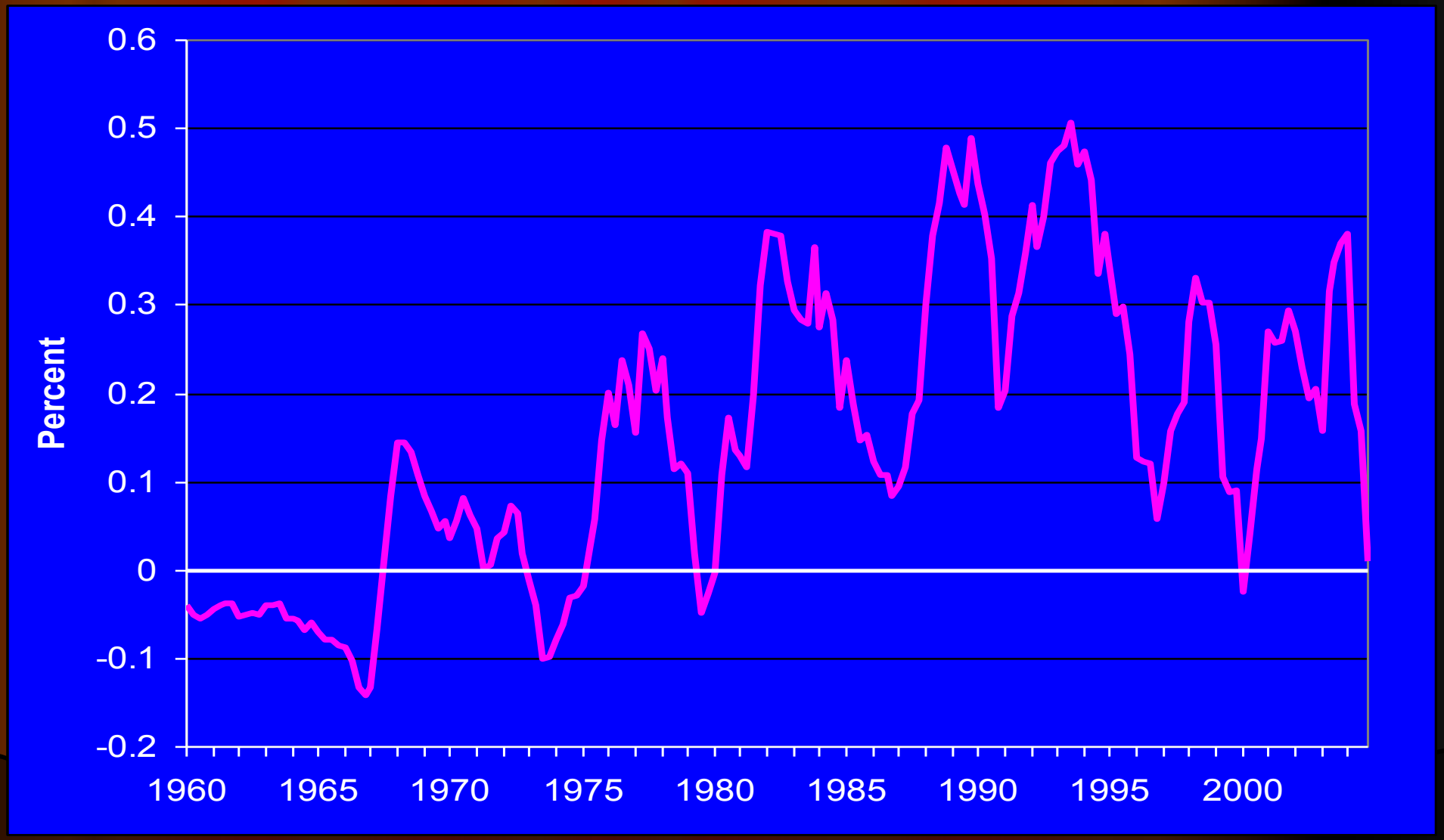
Changes in Relative Import Prices



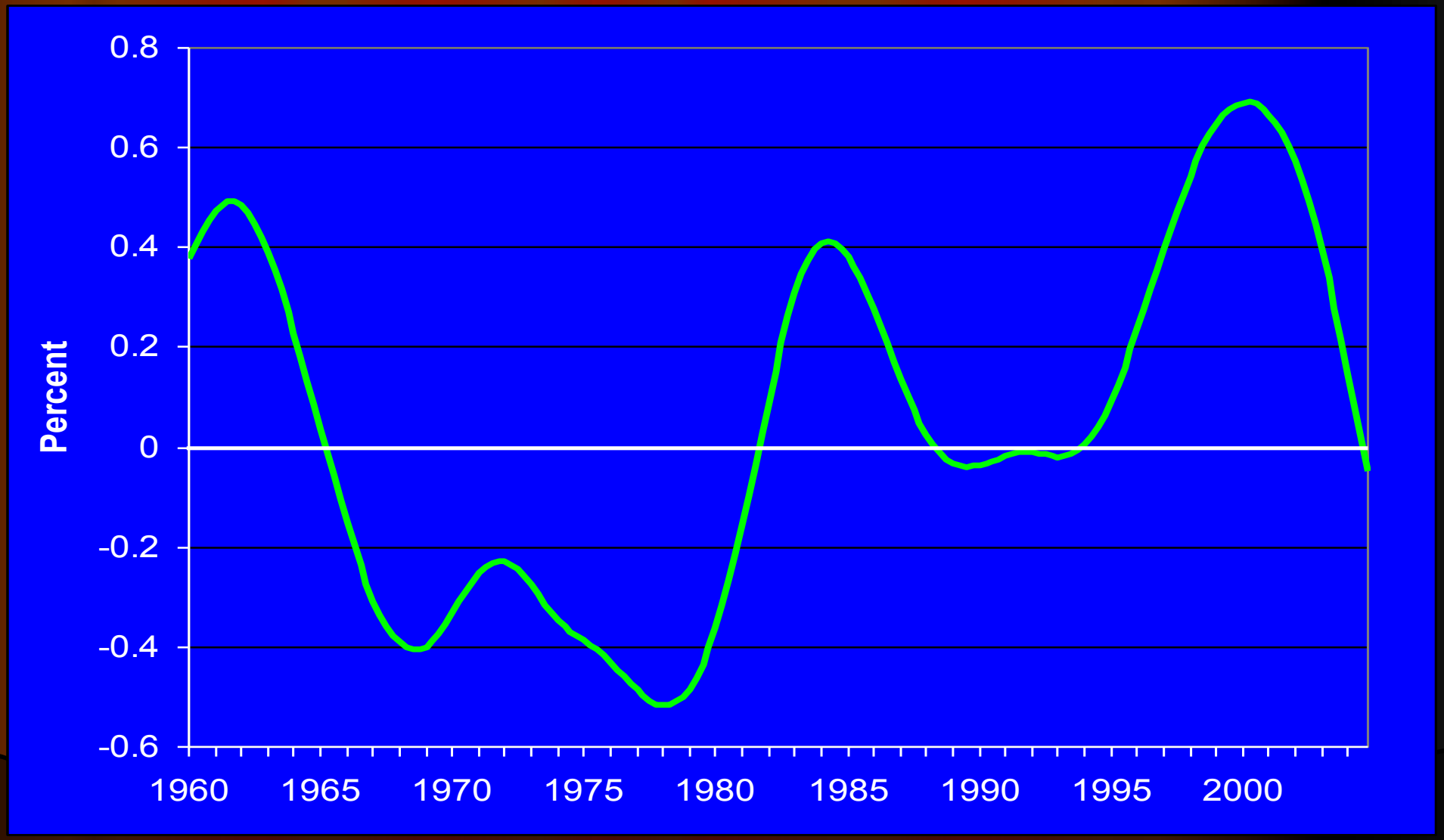
The Food-Energy Effect



The Medical Care Effect



The Productivity Growth Trend Acceleration

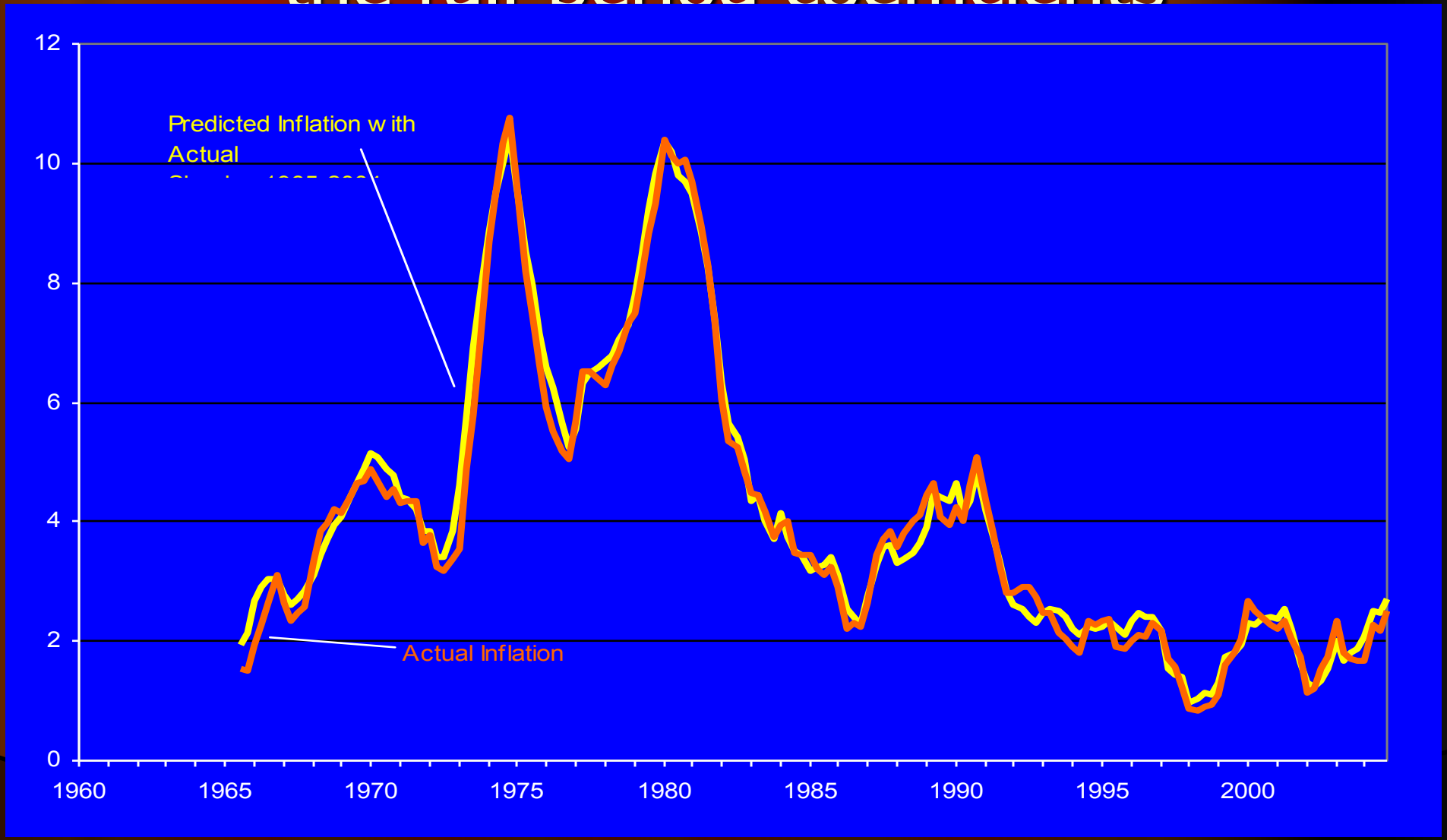


Actual Unemployment Rate and the Time-Varying NAIRU *(TVN)*

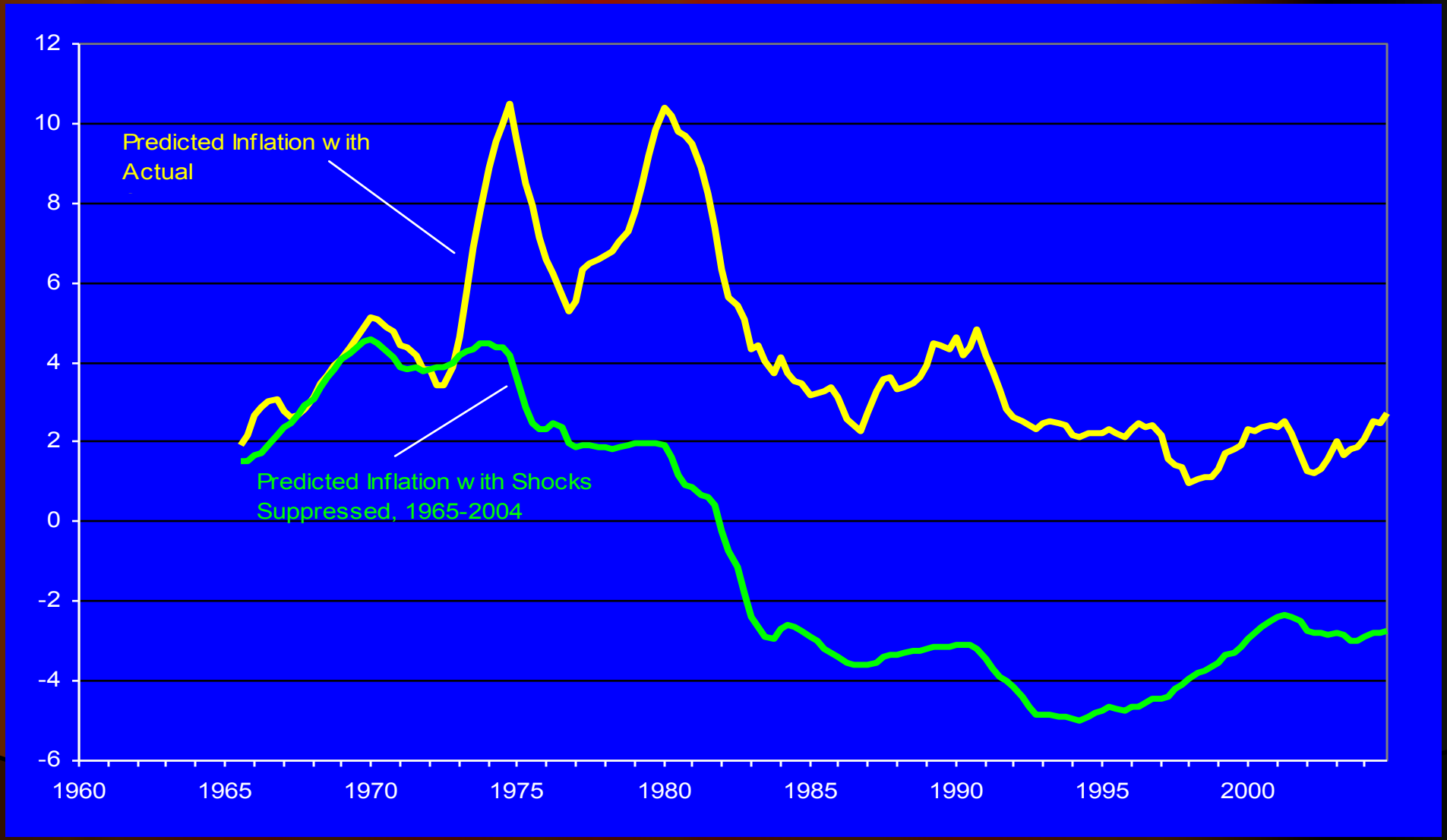
Coefficients of Inflation Equation are in Table 4

- Brief Comments on Size and Sign of Coefficients
- Importance of Testing Inflation Coefficients with Dynamic Simulations
- Results in Bottom of Table 4: Estimate coefficients through 1994:Q4, simulation 1995:Q1 to 2004:Q4 (40 quarters)
- Qualification: The Simulation Knows the Time-Varying NAIRU

A Longer Simulation: 160 Quarters Knowing the TVN and the full-period coefficients



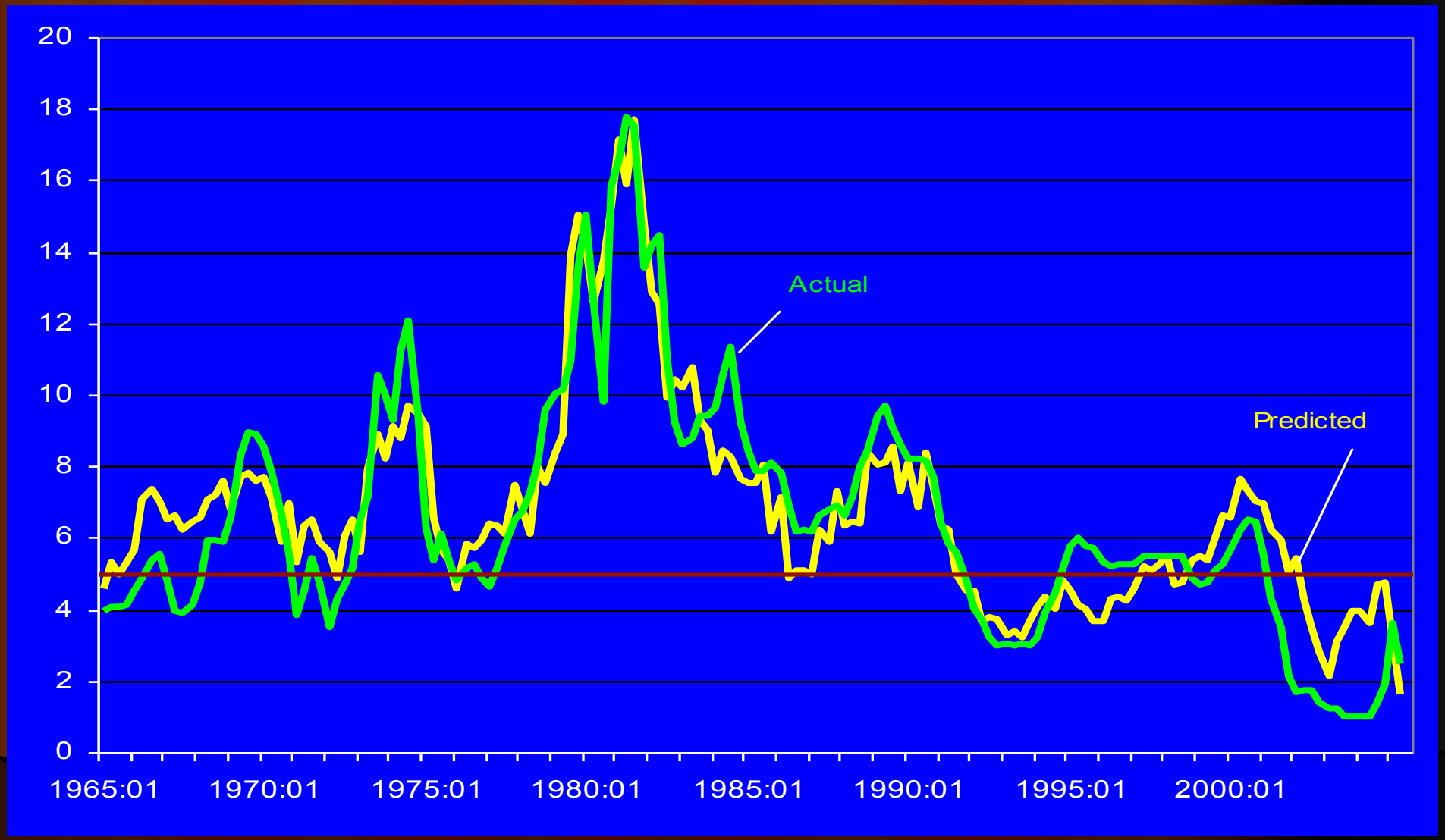
The Dramatic Effect of Supply Shocks



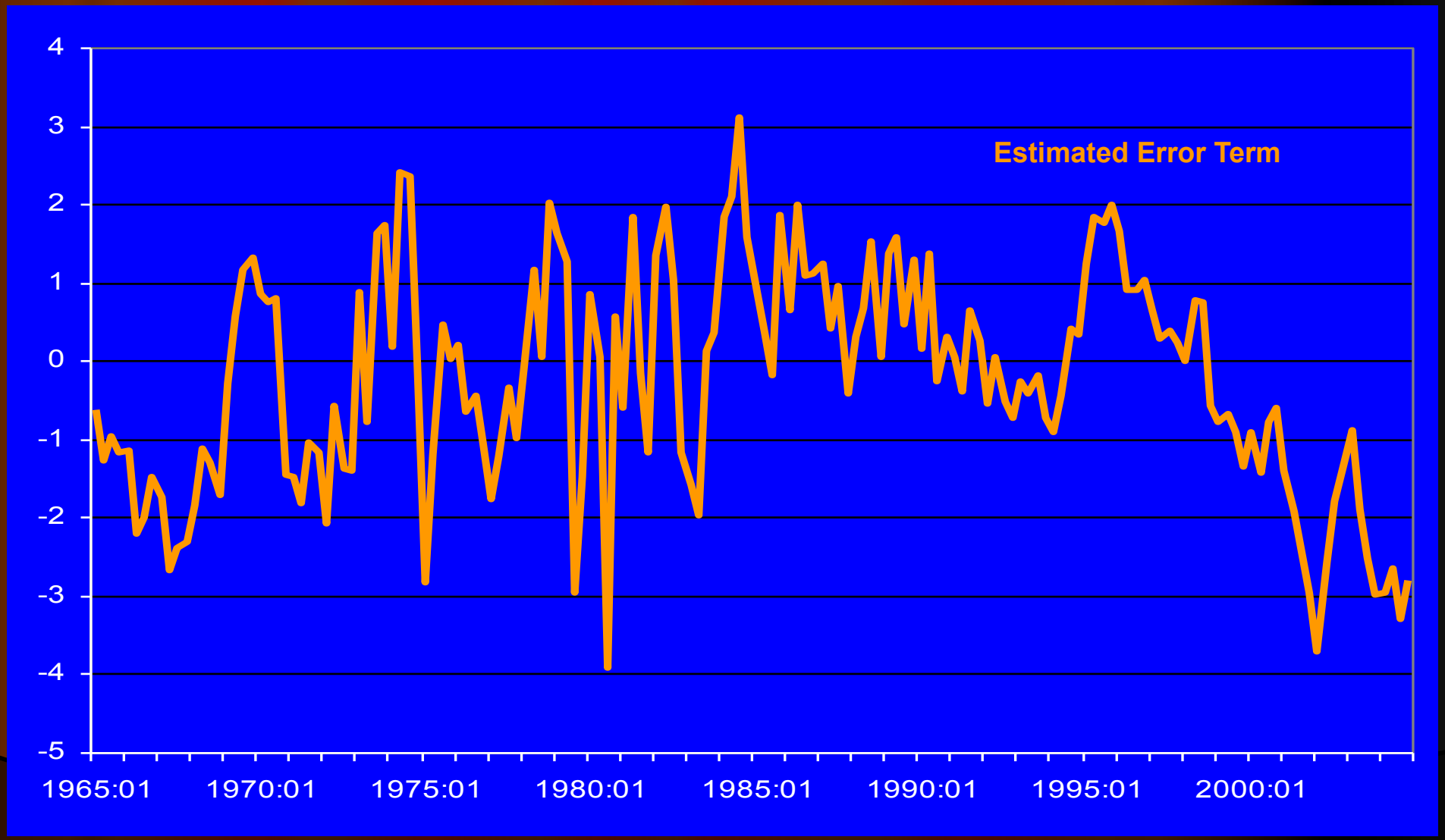
The Interest Rate Equation

- $R = T^* + p^* + a(p-p^*) + b(Ygap)$
- Estimated over three time intervals
  - 1960-79
  - 1979-90
  - 1990-2004
- Coefficients presented in Table 5
- After 1979, Fed fought inflation
- After 1990, Fed fought both infl & Ygap

Actual and Predicted Values of Fed Funds Rate



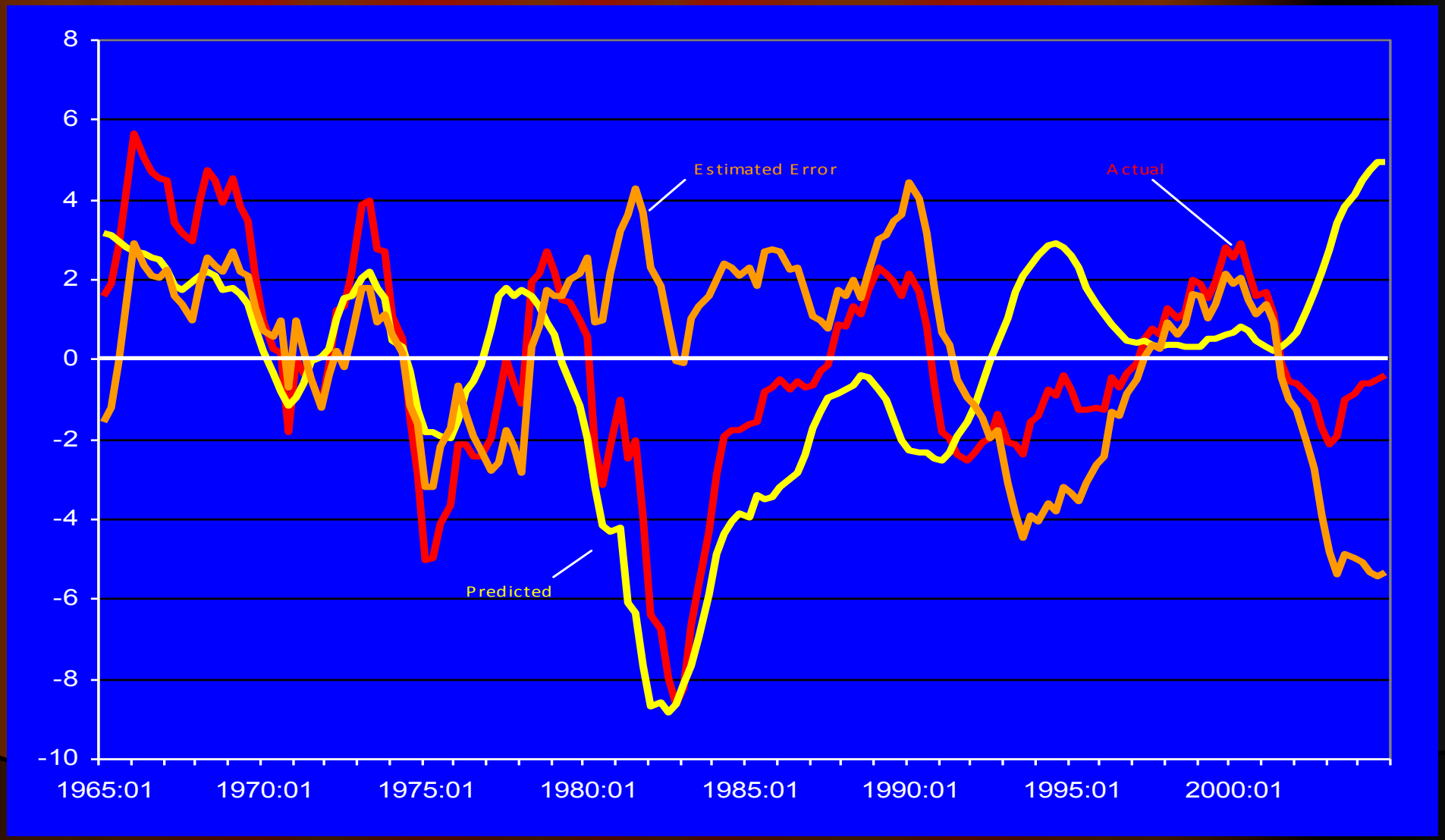
Interest Rate Error: Sustained after 1994



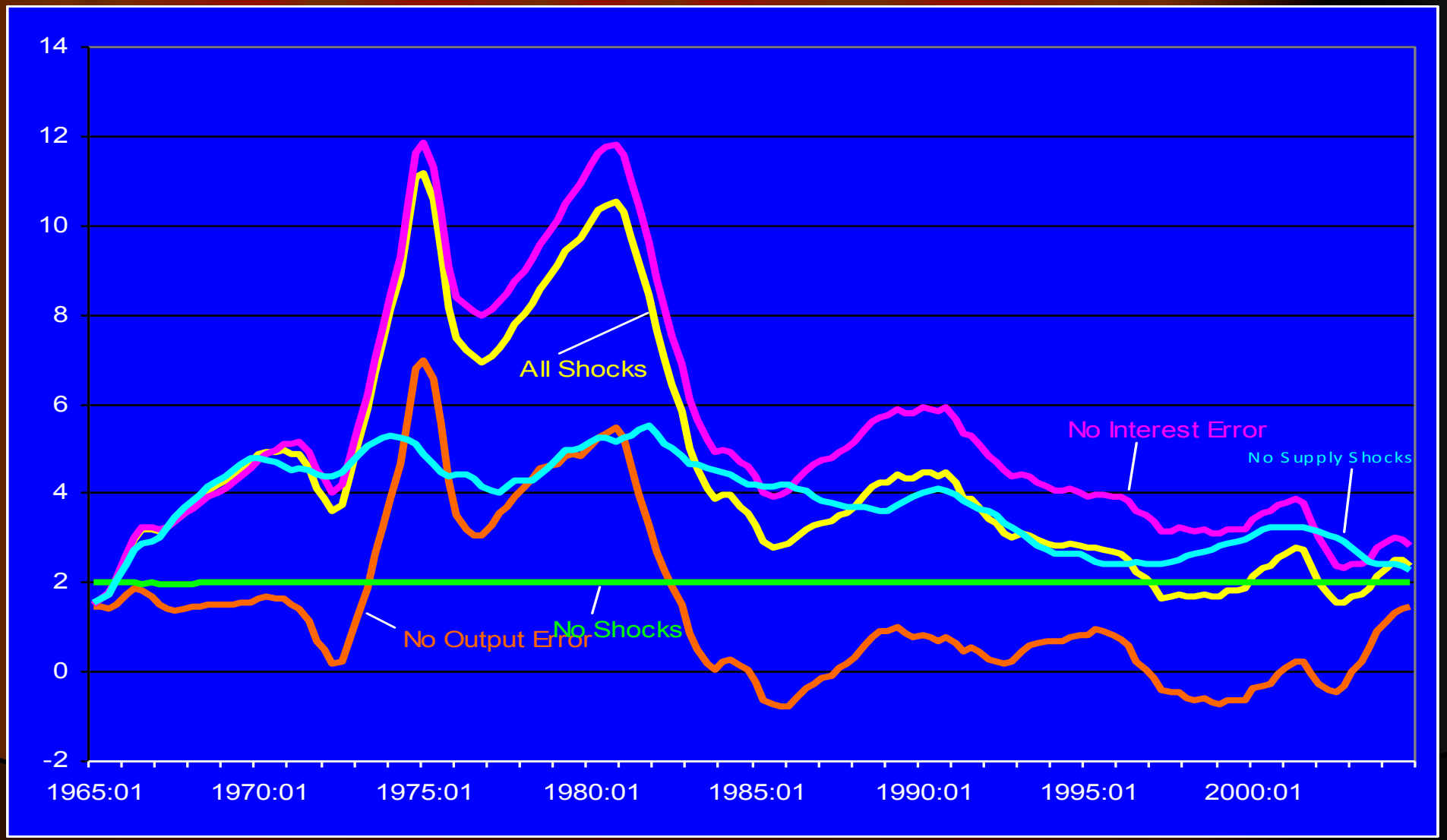
The Output Gap Equation

- First Difference of Output Gap regressed on
  - First Difference of Inflation Rate
  - First Difference of Lagged Nominal Fed Funds Rate, quarters 2-10 (why?)
- Real vs. Nominal Rates?
- An Central Concept in the Paper:
  - “The Output Error”

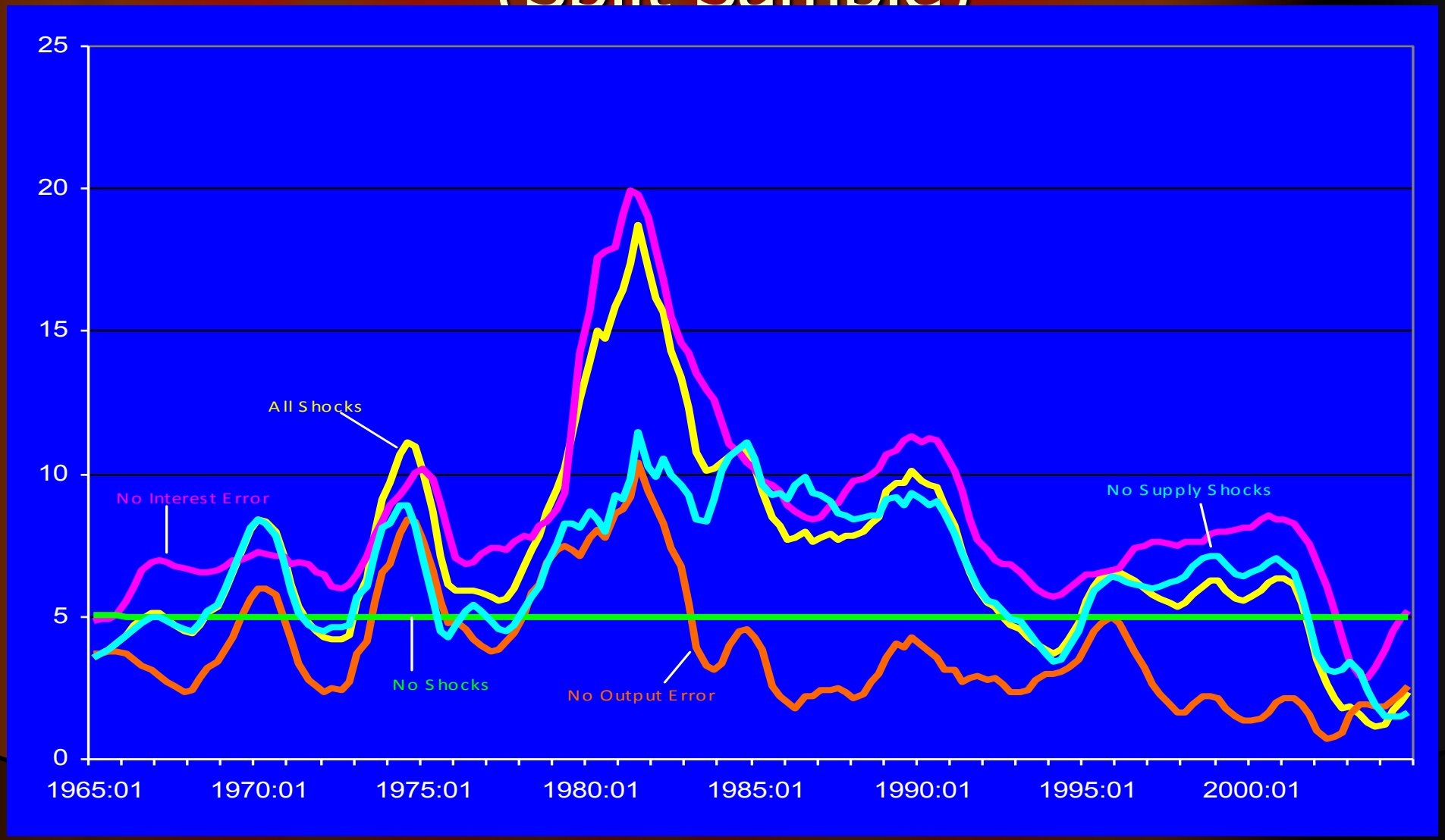
Predicted Output Values Miss, Especially after 1990



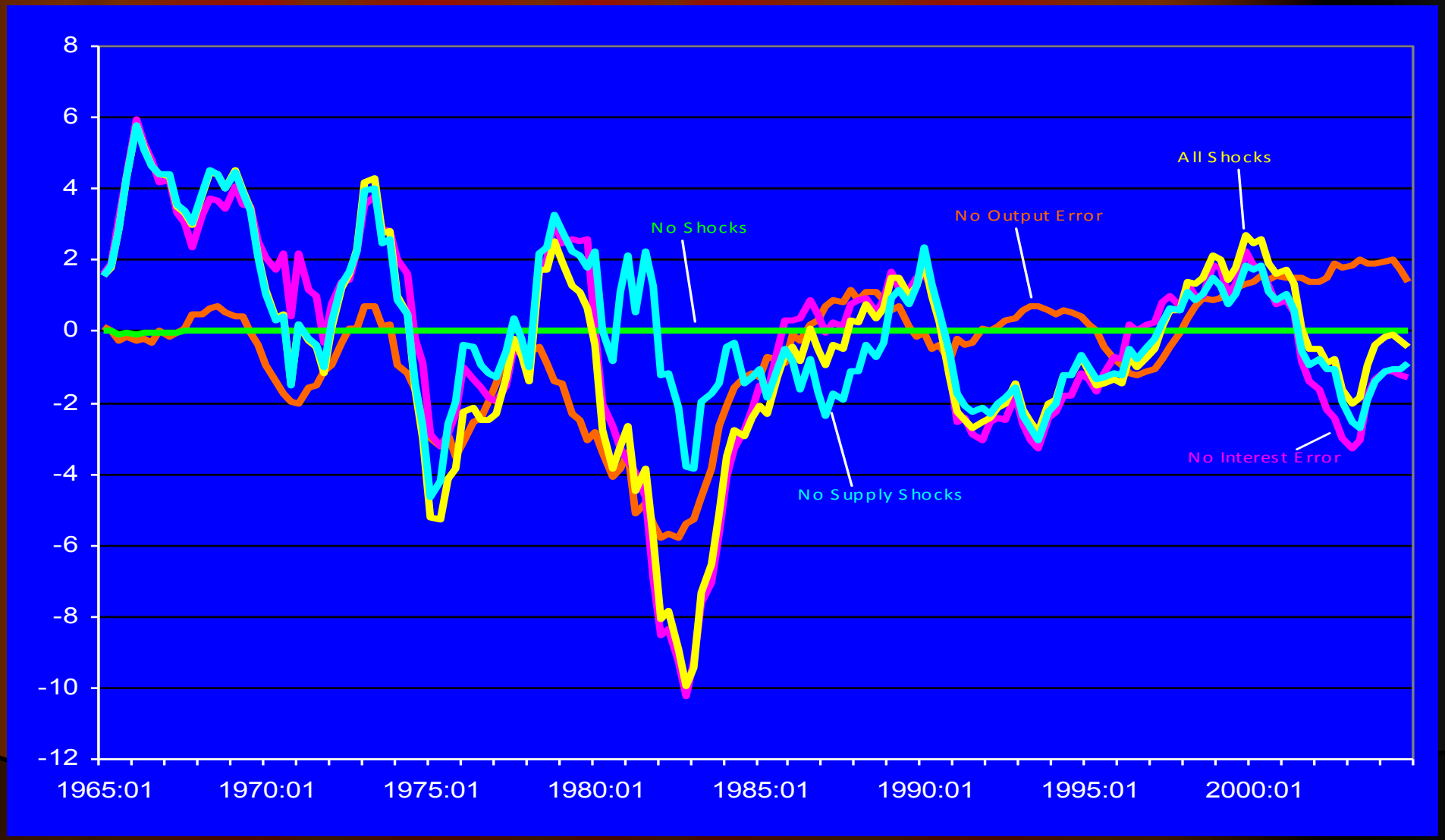
Full Model Simulations: Table 7 Here is Inflation



Full-Model Simulation of the Federal Funds Rate (Split Sample)



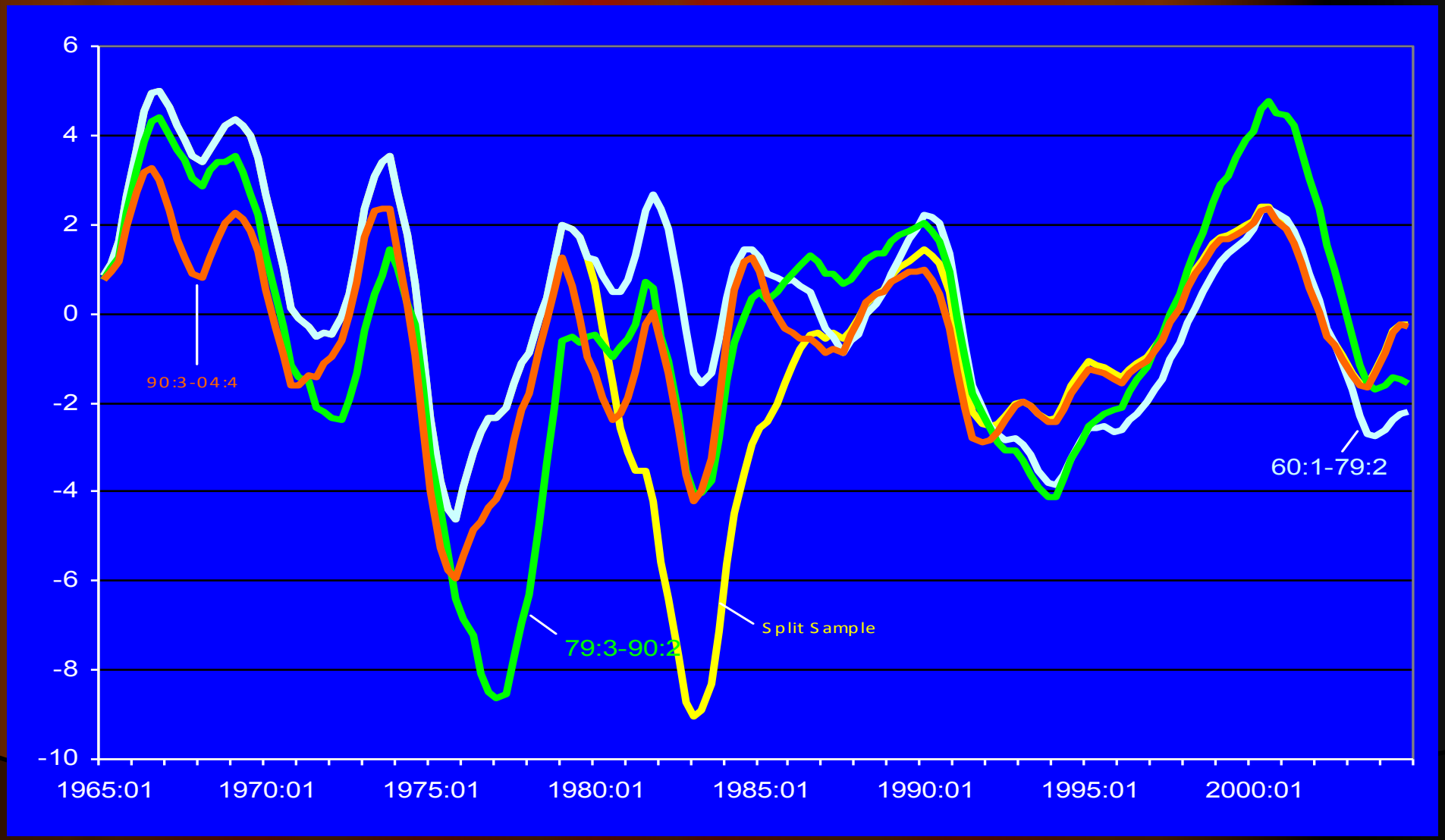
The Basic Conclusion of the Paper: The Output Gap Simulations



Bottom of Table 7: Summary of Output Gap Conclusions

- Standard Deviation of Output Gap
- Absolute Value of Output Gap
- Supply Shocks and the Output Error were
  Roughly equal culprits
- No Role of Interest-rate Error

Effects of Changes in Monetary Policy Feedback Responses



Conclusions

- Demand and Supply Shocks both Mattered
  - The Major Demand Shocks were Military Spending, Financial Institutions that Destabilized Residential Investment, and Primitive Inventory Management
  - The Major Supply Shocks were Import Prices (and Flexible Exchange Rates), Food-Oil Prices, Medical Care Prices, Productivity Trend, and Nixon Controls

Role of Monetary Policy

- Accommodative Policy in the 1970s Allowed Inflation to Take off
- Made 1981-82 Recession Worse
- Volcker Post-1979 Monetary Policy Created Instability
- Best Policy of All: Greenspan Policy applied to entire postwar period!
  - Combined inflation and output target beats a pure inflation target by every criterion