Discussion of Irvine and Schuh

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This Paper is Novel and Important

- The Great Moderation is not caused by
  - "Good Luck"
  - Better Monetary Policy
- Rather, 80% of reduced volatility is explained by changes in the structural relationships between industry-sector sales and inventory investment
- We only need to look at manufacturing and trade
  - Can neglect such previous "usual suspects" as military spending and residential construction

This Discussion, like Gaul, is Divided into Three Parts

- The first part summarizes what I thought about the Great Moderation before reading this paper
- The second part summarizes the most important results of the authors
- The third part ponders the significance of the paper's results: by how much do I need to change my previous interpretation of the Great Moderation

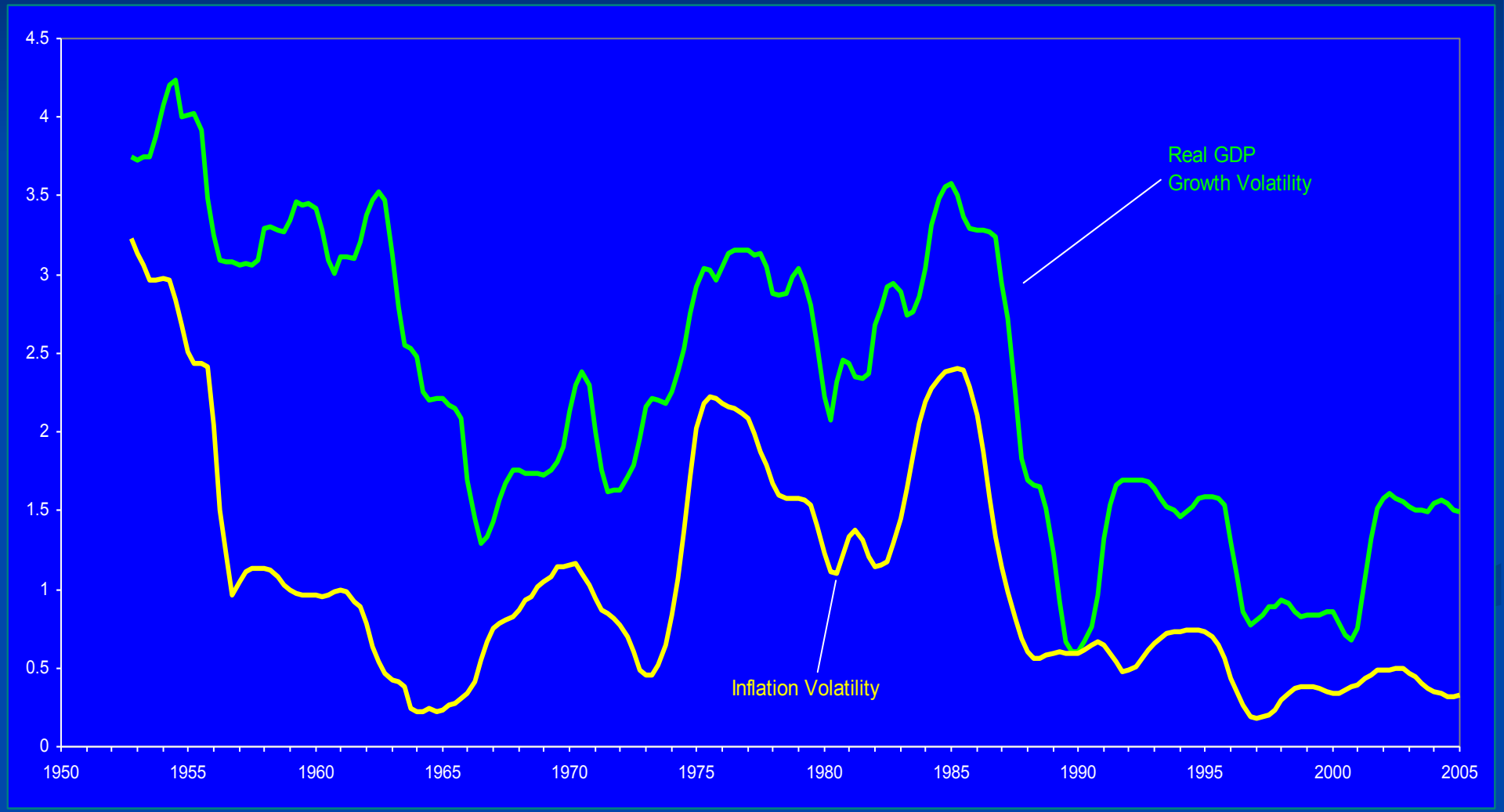
My Interpretation of the Great Moderation

- This is from NBER WP 11777 in November 2005
- Published in an obscure conference volume of the Reserve Bank of Australia, where the volume is devoted to exactly the same topic as the current SF conference.
- Some of the papers in that conference volume are worth looking up, not just mine

Stabilization before and after 1984

- Shocks
  - Demand shocks
    - Federal government now the culprit not the salvation
    - Inventory management
    - Financial Market Deregulation stabilized residential housing
  - Supply shocks
- Improved monetary policy
- Of Lesser Importance
  - Shifts in shares to services

Inflation vs. Output Volatility: 20-quarter rolling standard deviation of 4-quarter growth rates



Summary of inflation volatility vs. real GDP volatility (20 qtr st dev)

	1952-72	1973-87	1988-2005
Real GDP	2.69	2.87	1.25
GDP Deflator	1.11	1.67	0.48

Demand Side: Decomposition of GDP Contributions by 11 Sectors

Standard Deviations of 4-quarter Moving Averages of a Sector's Contribution to Δ Real GDP

	1950-83	1984-2005	Diff	%
Real GDP	3.14	1.61	-1.53	100
Omit RS	2.78	1.44	-1.34	88
Omit II	2.44	1.33	-1.11	73
Omit Fed Govt	3.18	1.61	-1.57	103
Omit All 3	1.93	1.19	-0.74	48

This Raises my First Question

- Inventory Change Accounts for 27%
- Inventory Changes, Residential Structures, and Federal Govt Account for 52%
- How Can a Paper That Covers only Manufacturing and Trade Account for most of the reduction in volatility?
- Consider the Possibility that the Shocks Feeding into their Structural Mechanism have Reduced Volatility

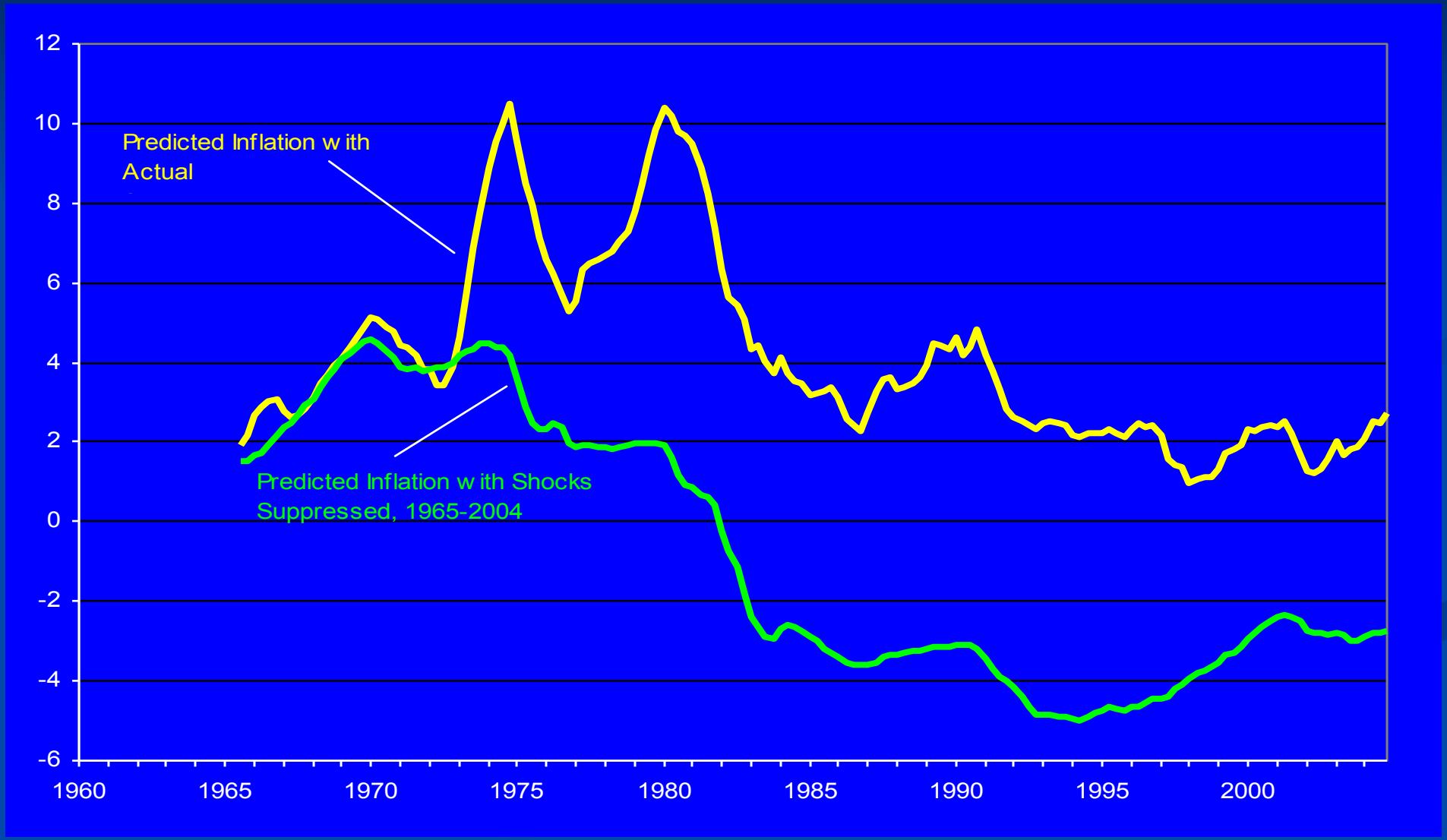
Contrast their HAVAR with my Three Equation Model based on Stock-Watson

- 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
- Main difference from Stock-Watson (2002,2003) is the use of specific supply shock variables instead of stuffing them into the error term

The Supply Shocks are Important and have been Neglected Here

- Everything is expressed as a relative rate of change. A zero value means no impact on aggregate inflation
- The list of four
  - Food-energy effect (difference headline vs. core inf)
  - Changes in relative price of imports
  - Changes in the productivity growth trend
  - Nixon-era price controls, "on-off" dummies adding to zero
- Next slide shows effect of suppressing all the supply shocks; all that's left is effect of LDV and Ugap.

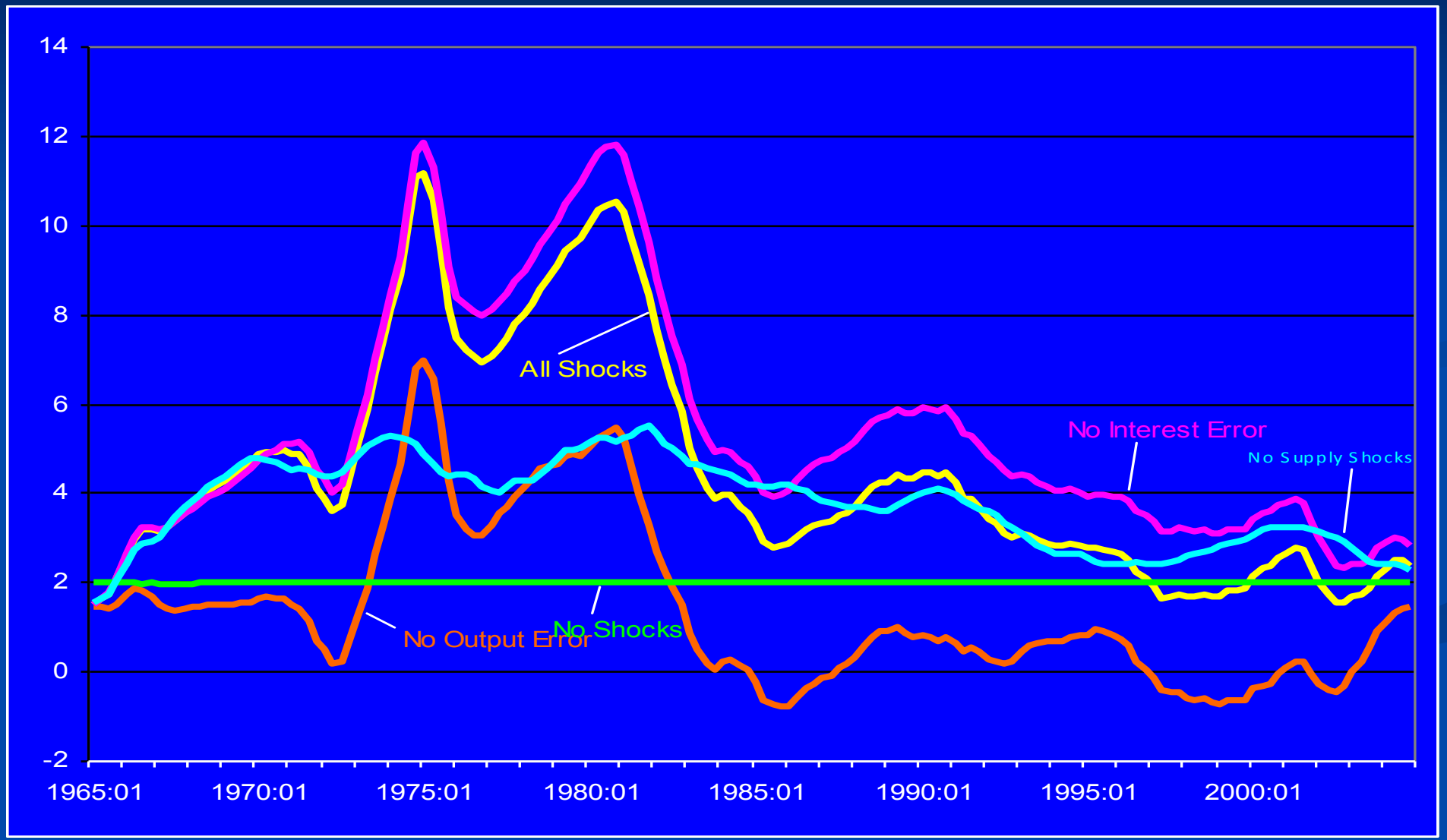
The Dramatic Effect of Supply Shocks



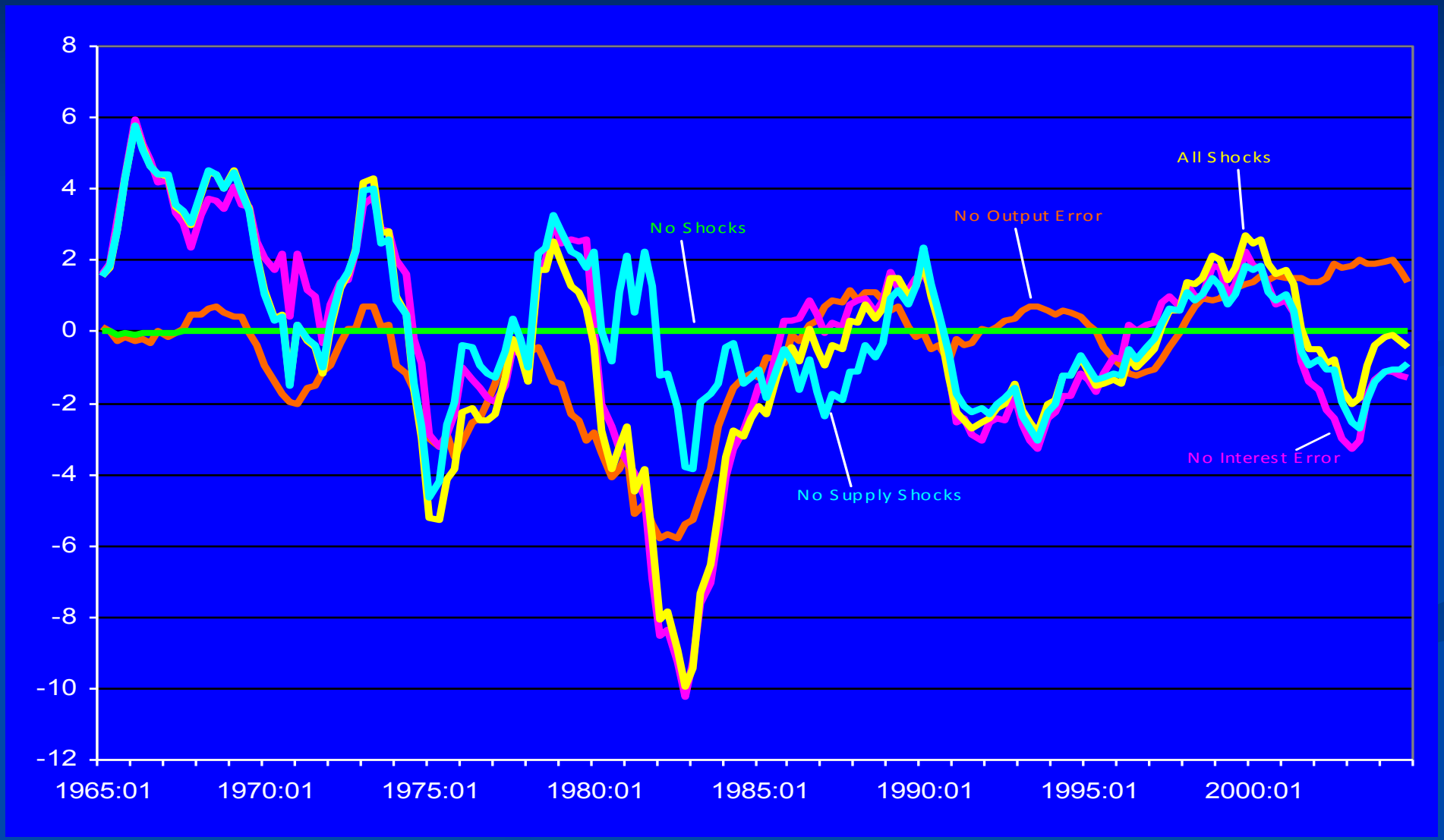
Results from the No-SS Simulation

- The no-SS simulation is driven entirely by the LDV and the current and 4 lags on the unemployment gap
- No difference until 1973
- Without SS, inflation goes negative after 1982. But Volcker inflation-fighting would have been unnecessary without SS
- Difference narrows in late 1990s, why?

Full Model Simulations: Here is Inflation



The Basic Conclusion of the Paper: The Output Gap Simulations



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, Productivity Trend, and Nixon Controls

Full-Model Simulations

- Comparing 1965-83 with 1984-2004
- Inflation Volatility
  - Reversal of SS Accounts for 80%, Output Error 20%
- Output Volatility
  - St Dev 2/3 explained by OE in both periods
  - SS contributed about 1/3 in first period

Monetary Policy

- Big Surprise, Greenspan = Burns
- Narrow View: Many other changes
  - Credibility Because there was no inflation
  - Would have behaved differently if there had been more inflation
- Inflation-Output Gap Tradeoff Lives On
  - Greenspan policies throughout would have delivered 5 points higher inflation post-84
  - Output benefits only temporary

Irvine-Schuh Conclude 80% Structural Change not "Good Luck"

- What does "Good Luck" Mean?
  - Switch of SS from bad to good is indeed "Good Luck"
  - But financial deregulation that reduced residential construction volatility is policy, not good luck
  - Reduced size and volatility of military spending is policy, not good luck
  - Improved inventory management results from technology, so "good luck" is a misnomer also

Summary of Paper's Results

- Point of Departure, VAR
  - 21% of Great Moderation to Structural Change, 79% to "Good Luck"
- Their 3-sector HAVAR attributes 73% to Structural Change, only 27% left for Good Luck
- Since Improved Inventory Management is the top item on my list, I support the overall theme of their paper
- Qualification on p. 3: "A single, or even unified explanation, for the Great Moderation may be unlikely"
  - I agree, because I have already pointed to four explanations, not just one

Consider the Auto Industry

- My Story, "changed structure" represents reduced macro volatility from other sources
- Faced with much reduced sales shocks, firms can and did manage inventories better
  - This can account for much of the reduced covariance between sales and inventories, between industry j and k
- Don't forget 1970:Q4 GM strike, that huge spike in Figure 1. Yes, absence of auto strikes and labor strife is a structural change
- Good points in auto discussion: Dealers sell multiple brands, role of imports and exports
- Don't forget Toyota "pull vs. push" as foreign manufacturers invade US with a different system (Toyota operates with ½ the inventories per market share point, this week's WSJ)

Interpreting this Paper: Impulse vs. Propagation Mechanisms

- By omitting any mention of military spending, residential construction, or inflation supply shocks, they "import unexplained" into their analytical structure at least half of the decline in output volatility
- All their metrics of reduced volatility are as a percentage of M&T variance, not total economy variance.
- By the way, why does data analysis extend only to 2001?

Covariance between Sales and Inventory Investment (Table 3)

- What Table 3 shows is a radical decline in the late/early ratios in every row
- Variances and covariances declined in every row
- No evidence here for a change in structure, rather this seems compatible with some outside force reducing variance in sales which allowed reduction in variance of inventories and in covariance

Advantages of HAVAR Model

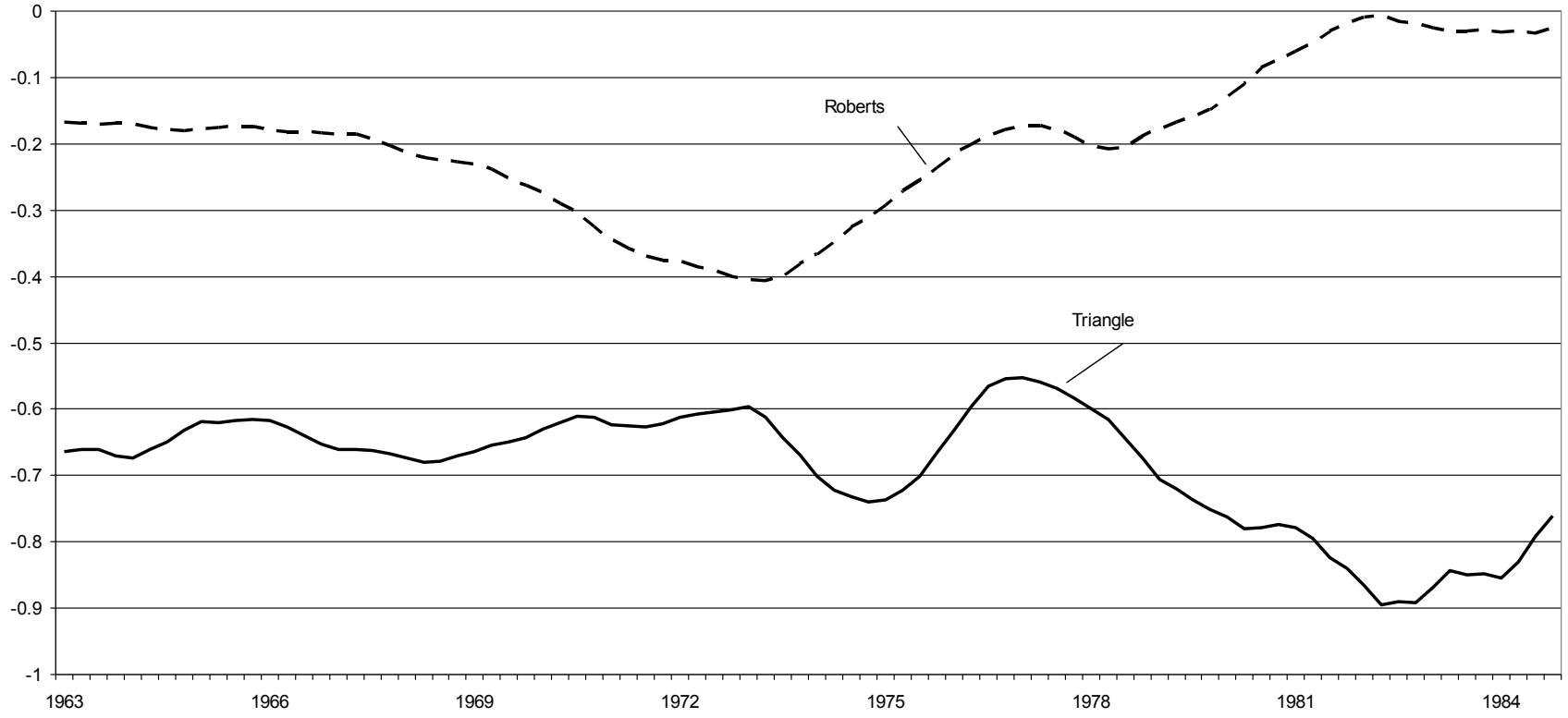
- Any Model that Nests other Models is Good
- Can Measure Significance of Implicit Restrictions
- However this works both ways
- My inflation model nests any simple VAR approach as in this paper

The HAVAR inflation equation is nested in mine

- Like Stock-Watson, the inflation equation depends only on the output gap and Fed Funds rate
- All supply shocks are stuffed into the error term
- Short lags on lagged inflation
- Example of the flaws of this approach
  - Consider John Roberts of the Fed
  - Inflation depends on the unemployment gap and four lags of inflation

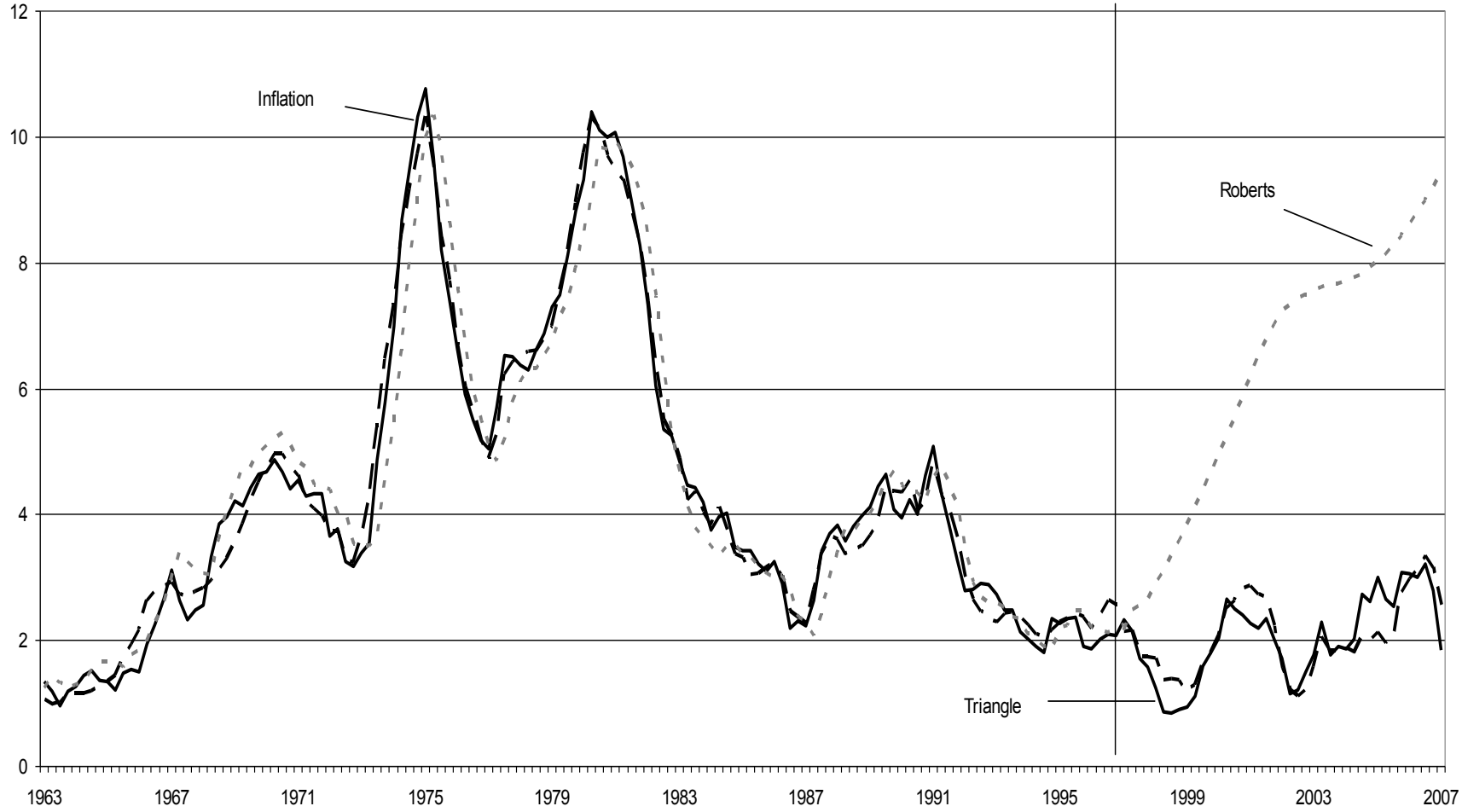
Bias in Size and Drift of Phillips Curve Slope

Figure 9. Roberts Vs. Triangle Unemployment Coefficients on 90 Quarter Rolling Regressions from 1962:Q1 to 1984:Q3



Post-Sample Dynamic Simulations

Figure 8. Predicted and Simulated Values of Inflation from Triangle and Roberts Equations 1962:Q1 to 2006:Q4



Back to the HAVAR Structure

- Assumption (p. 17) that II does not affect sales contemporaneously but sales do affect II
- This is violated by the everyday behavior of the auto industry
  - Overproduction leads to price incentives, interest rate incentives that directly increase sales
- Violated every day also in today's housing industry, where excess inventories lead to price reductions in order to stimulate sales
- Also conflicts with bottom p. 18 "inventories in one sector might plausibly affect sales in the other sector"

Other Aspects of HAVAR

- Unlike Stock-Watson and others
  - No attempt to portray differences in monetary regimes
  - Other papers with this VAR structure allow for shifts of coefficients in the interest rate equation in 1979 and 1987 or 1990
- Discussion of sales persistence in autos
  - Not enough discussion of increased price flexibility
  - Price incentives and interest rate incentives

General Conclusion

- Link with Gambetti-Gali paper
- My interpretation of hours-productivity correlation combines positive and negative correlation
- As overall volatility is reduced, the share of positive correlation is reduced that that of negative correlation increases
- Something like that may be happening in the structural dynamics of this paper