

DSGE Models and Monetary Policy:
A Critical Perspective
After More Than One Decade of Progress

Alex Wolman, Federal Reserve Bank of Richmond
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DSGE Modeling at Central Banks

- Ten years have passed since the publication of Tack Yun's *JME* article (eleven since Kimball's *JMCB*).
- Given the voluminous body of academic research and central bank modelling effort this work spawned, it seems appropriate to assess where we are.
- So I will assess, selectively & idiosyncratically.

- I am a fan – this is the kind of work I do.
- It is good that monetary policymakers receive advice informed by models that are arguably legitimate for policy analysis.
- But, no fun to preach to the choir! I will
 - Criticize some aspects of central bank DSGE modeling (implicitly criticize some of my own work).
 - Discuss challenges facing CB economists as policy advisors.
 - Mainly questions, not answers.

Some history

- DSGE models were available for studying monetary policy nontrivially prior to Yun and Kimball
 - Liquidity effect models (Christiano and Eichenbaum, from Lucas and Fuerst)
 - Sticky-price models (Ohanian-Stockman, Cho-Cooley, King, Ireland,...?)
- Two broad, related dimensions of progress since then, as models have been enriched:
 1. DSGE Models routinely estimated, taken seriously as quantitative descriptions of macro data.
 2. DSGE Models routinely play a role in policy discussions at central banks.

Some history

- Before DSGE models could show up as an input into actual monetary policy discussions at central banks, they had to be seen at policy conferences...

Jackson Hole

You have to see it to believe it.



- The case of the Jackson Hole conference: monetary policy topics in
 - 1989
 - 1996
 - 1999

- **Monetary Policy Issues in the 1990s**
- **August 30 - September 1, 1989**
- [Monetary Policy in the 1990s: Lessons and Challenges](#)
CHARLES FREEDMAN
- [Commentary](#)
LYLE E. GRAMLEY
- [Changing Effects of Monetary Policy on Real Economic Activity](#)
BENJAMIN M. FRIEDMAN
- [Commentary](#)
RALPH C. BRYANT
- [Policy Targets and Operating Procedures in the 1990s](#)
DONALD L. KOHN, IAN J. MCFARLANE, YOSHIO SUZU
- [Europe 1992: Some Monetary Policy Issues](#)
ROBIN LEIGH-PEMBERTON

- **Achieving Price Stability**
- **August 29-31, 1996**
- [Opening Remarks](#)
ALAN GREENSPAN
Chairman, Board of Governors of the Federal Reserve System
- [Why Are Central Banks Pursuing Long-Run Price Stability?](#)
STANLEY FISCHER
First Deputy Managing Director, International Monetary Fund
- [How Should Central Banks Reduce Inflation? - Conceptual Issues](#)
MERVYN KING
Chief Economist and Executive Director, Bank of England
- [How Should Monetary Policy Respond to Shocks While Maintaining Long-Run Price Stability? - Conceptual Issues](#)
JOHN B. TAYLOR
Professor, Stanford University

- **New Challenges for Monetary Policy**
- **August 26-28, 1999**
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ALAN GREENSPAN
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MERVYN KING, Deputy Governor
Bank of England
- [Monetary Policy and Asset Price Volatility](#)
BEN BERNANKE, Professor
Princeton University
MARK GERTLER, Professor
New York University
- [How Should Monetary Policy Be Conducted in an Era of Price Stability?](#)
LARS SVENSSON, Professor
Institute for International Economic Studies, Stockholm University

- **New Challenges for Monetary Policy**
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New York University
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LARS SVENSSON, Professor
Institute for International Economic Studies, Stockholm University
- First DSGE model for monetary policy at JH**
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History (cont.)

- So, between 1996 and 1999 it became acceptable / expected to use DSGE models to talk about monetary policy at a policy conference (vs. academic conference, where happened much earlier).
- Since then, tremendous progress in model development & evaluation, giving DSGE models a place at the table for policy discussions.
- We want to stay at the table though, so we need to confront weaknesses.

More Substantive Remarks

- Our role as model builders and model evaluators
- Our role as policy advisors

(Of course we can't separate the two roles)

Building and Evaluating Models

1. What notion of equilibrium?
2. How weight micro and macro data?
3. What about seasonality & trends?
4. Money

1. What notion of equilibrium?

- Quantitative DSGE models for policy analysis are solved using local methods.
- This is inevitable, given models' size.
- Yet, we know it is not always innocuous (in smaller models).
 - Benhabib, Schmitt-Grohe and Uribe (zero bound)
 - King and Wolman (discretionary policy)

2. Micro and macro data?

- Familiar dilemma, but unsettled (e.g. IPN docs, Woodford disc. of 2005 FRB conference)
 - For thinking about macro policy want model that describes macro data well. No hope of a model that matches “all” micro data.
 - Yet, what use microfound’ns if (price or wage) heterogeneity induced by microfound’ns dramatically at odds w/ data?
 - Shameless self-promotion: Dotsey, King & I working on version of state-dep model w/ potential to provide much better match to micro data.

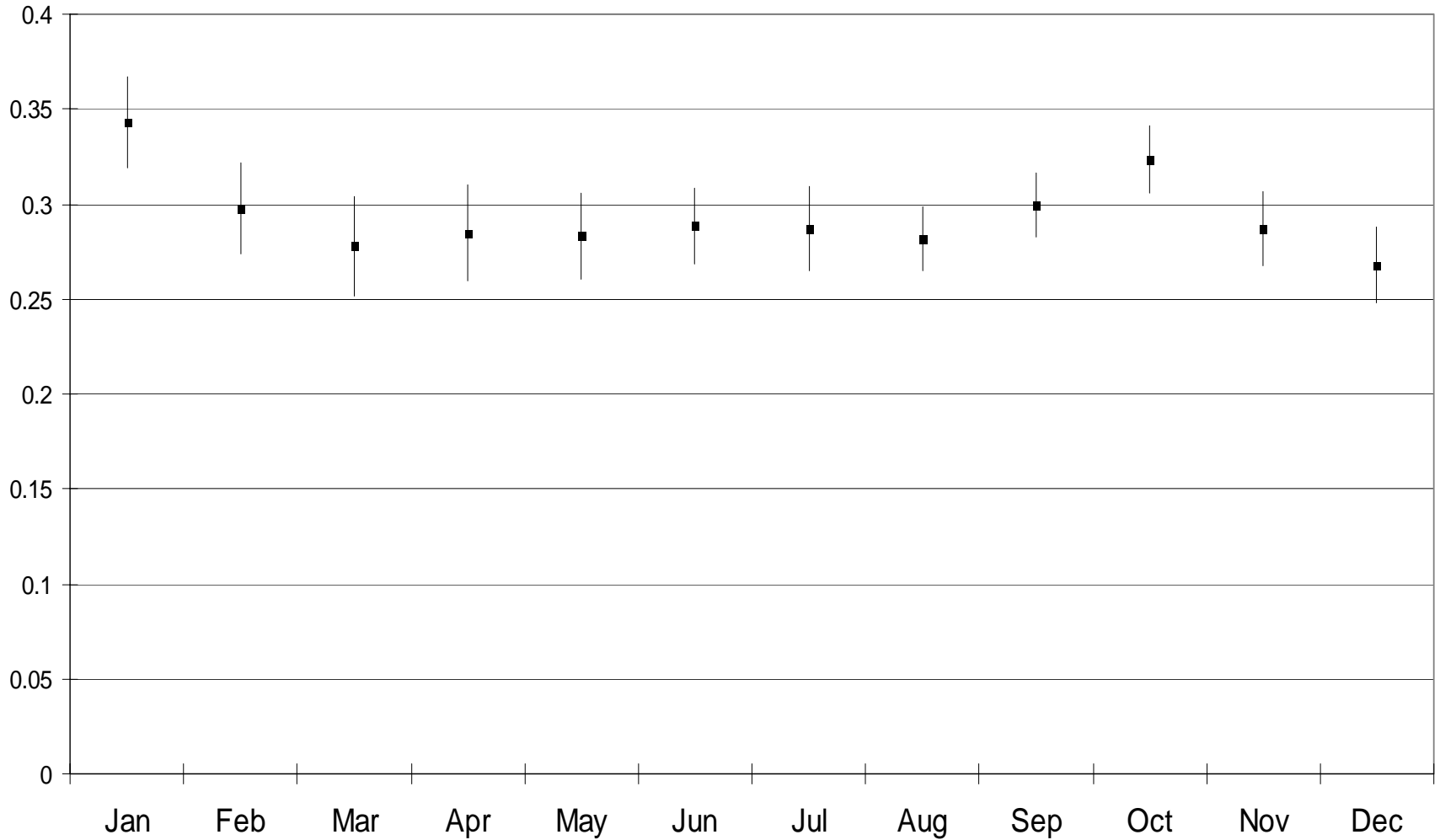
3. What about seasonality and trends?

- Our models typically abstract from S & T.
- Acceptable abstraction if these features of the data “separate” from the issues with which we are concerned.
- Do they?

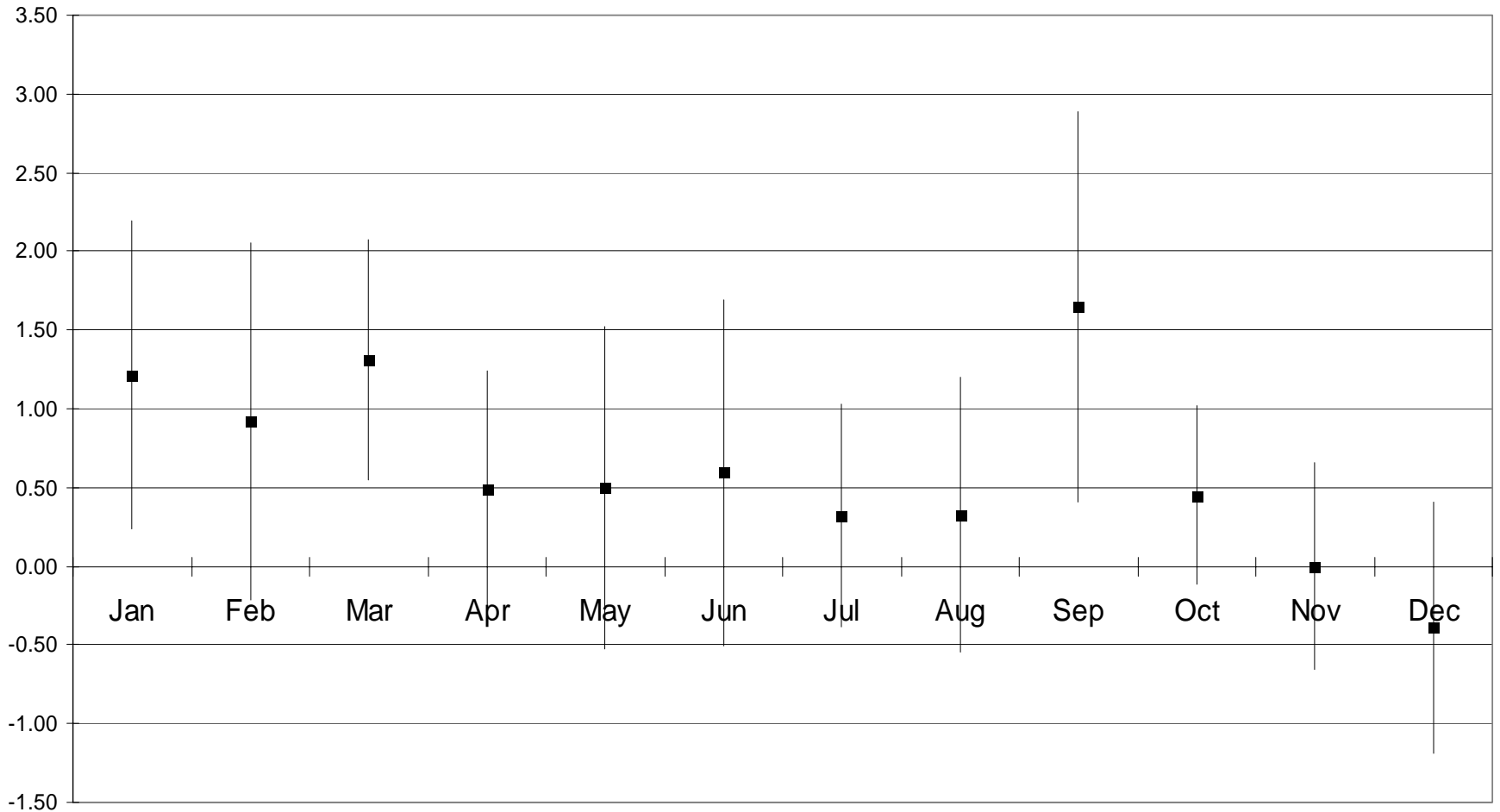
3.A Seasonality

- Klenow and Kryvtsov's CPI data: in 12 out of 15 years, highest fraction of price changes in January; in 6 out of 15 years, biggest average price change in Sept.
- More generally evidence of seasonal in this micro data:

**Average fraction of price changes by month,
with +/- 1 standard deviation bands
(Klenow and Kryvtsov data)**



**Average % price change by month,
with +/-1 standard deviation bands
(Klenow and Kryvtsov data)**



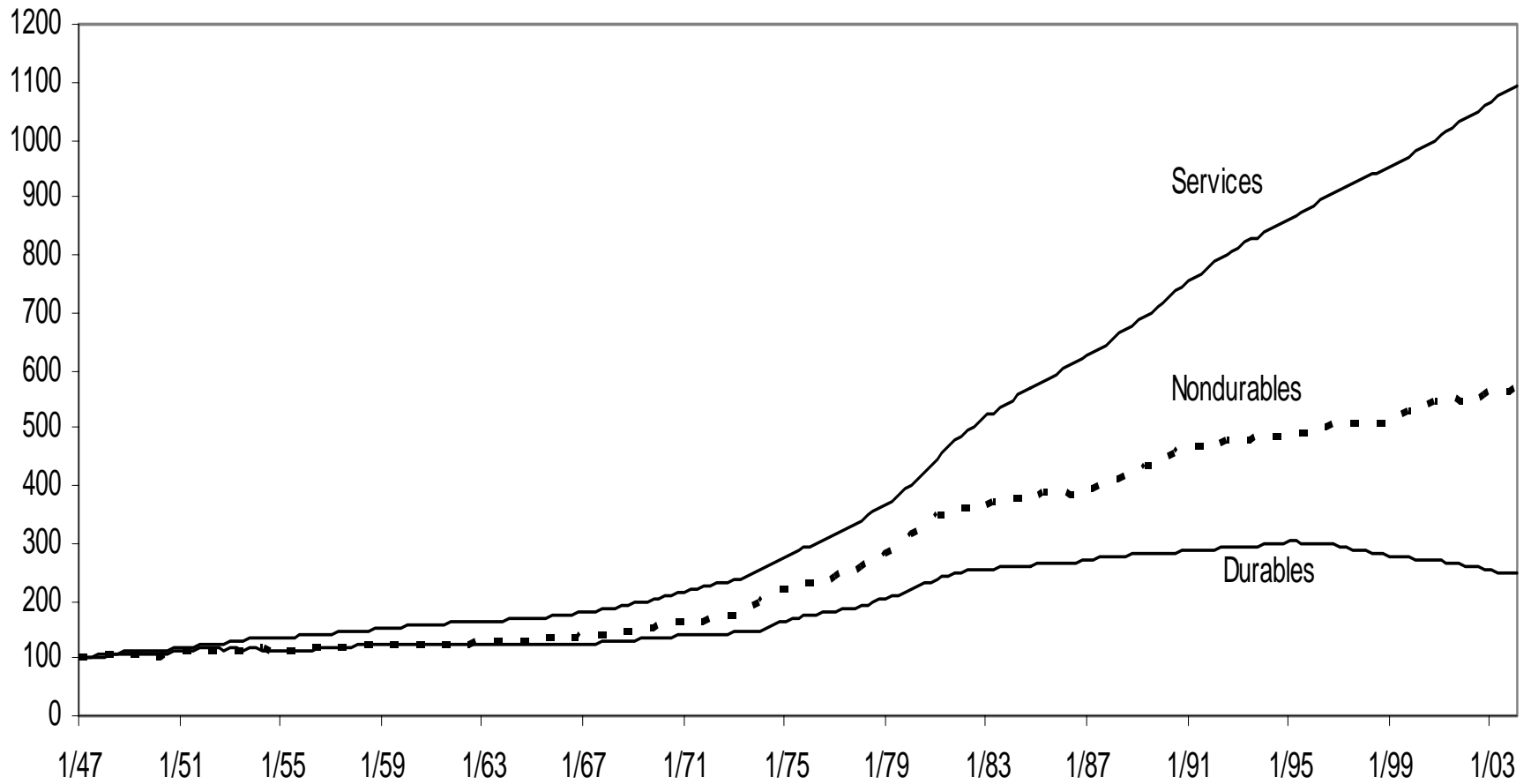
3.A Seasonality (cont.)

- Because we are interested in seasonally adjusted macro data, it is natural to abstract entirely from seasonality.
- However, using micro data mucks up that approach – because seasonality looks to be a major driver of the micro data...

3.B Trends

- The trend we often think about – and abstract from -- is real output growth.
- But, there are other trends in the data, for example in relative prices:

Sectoral Price Levels from U.S. P.C.E.



3.B Trends (cont.)

- Is it costless to abstract from these trends in relative prices? No. Consider the optimal average rate of inflation:
 - Many sticky price models imply approximate optimality of stabilizing individual prices.
 - In one-sector models, \rightarrow stabilize price level.
 - Multi-sector model w/ trending relative prices, infeasible to stabilize all individual prices, optimal average rate of inflation not obvious (Wolman 2005).

4. Money

- Fact: most recent literature applying DSGE models to monetary policy issues assigns no role whatsoever to money.
- Woodford provides an eloquent defense of the cashless approach. For some questions it must be legitimate.
- For the zero bound? The zero bound exists because we can hold money. I am not convinced that we understand the z.b.'s implications for policy; I associate that lack of understanding with lack of a good model of money. Maybe search will become that model.

Providing Policy Advice

1. Use a one size fits all model?
2. Emphasize precise implications of models, or general principles?
3. How help policymakers communicate?

1. One Size fits all model?

- “New Keynesian” models now dominant at central bnks (w/in set of eqlb models)
 - Good: facilitates communication
 - Bad: we automatically use that model instead of best model for particular question
- Looking at the topics on this program, I may be overstating this concern:
 - NK models enriched to incorporate range of other features.
 - Yet I still do have concern.

2. Precise Implications of Models, or General Principles?

- Given clear deficiencies of our models, we risk losing capital as policy advisors by pushing precise policy implications of particular models, vs. general principles
- Large literature on policymaking under uncertainty helps address this concern, but doesn't eliminate it.

3. Helping Policymakers Communicate

- One of our most important, difficult challenges is to help policymakers “communicate the nature of their systematic commitments to the public” (Woodford book page 3).
- Can only do this to extent that agree on what the nature of those systematic commitments should be.
- Means agreeing on models, or LCD of models. Conferences like this play an important role!

Last slide

- As policy advisors, we ought to be humble, acknowledge the limitations of our models
 - *“Moreover, in the case of _____, it was important for the _____ to learn just how much uncertainty and controversy there was about many important matters”*

Last slide

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 - *“Moreover, in the case of **Reducing inflation**, it was important for the **FOMC** to learn just how much uncertainty and controversy there was about many important matters”*

Last slide

- As policy advisors, we ought to be humble, acknowledge the limitations of our models
 - “Moreover, in the case of *Vietnam*, it was important for the *president* to learn just how much uncertainty and controversy there was about many important matters”
Daniel Ellsberg’s memoir, *Secrets*, page 235.

Last slide

- As policy advisors, we ought to be humble, acknowledge the limitations of our models
 - *“Moreover, in the case of Vietnam, it was important for the president to learn just how much uncertainty and controversy there was about many important matters”*
Daniel Ellsberg’s memoir, *Secrets*, page 235.
- But, don’t hesitate to use our models to critique others’ policy advice.
- Be open-minded about what models to use, & how to evaluate & modify models.