Discussion of "The Great Moderation in the Japanese Economy"

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Great Moderation

1. Decline in the volatilities of macro economic variables, in particular GDP growth
2. Stock and Watson (2005, JEEA)
   (a) Estimate FSVAR model with common international factors and country specific shock
   (b) G7 output volatilities have been low for the last 20 years except for Japan
   (c) Reduction in volatility is associated with a reduction in the magnitude of the common international shocks
   (d) For Japan international shocks have become unimportant, and domestic shocks explain nearly all of its volatility in the 1990s
3. Few studies about Japanese output volatility dynamics and its source

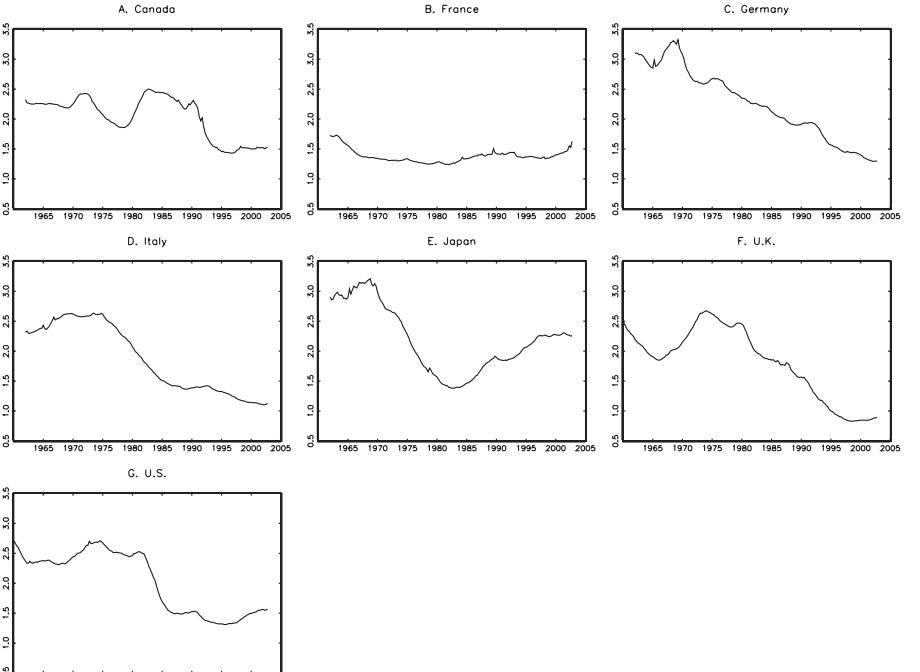


FIGURE 4. Estimated instantaneous standard deviation of four-quarter GDP growth.

Contributions

1. Investigate possible "Great Moderation" in Japan
2. Examine the timing and sources
3. Focus on output (OP), labor inputs (LI), labor productivity (LP)
4. Provide many interesting findings
5. Some comparison with US case

Basic Methodology

1. SVAR model with time-varying coefficients and stochastic volatility
2. Flexible way to model changes in
   (a) Impulse response function
   (b) Variance decomposition
   (c) Unconditional and conditional comovements
3. Considered variables
   (a) Output: y_t
   (b) Labor input: li_t
   (c) Labor productivity: $lp_t = y_t - li_t$
   (d) $x_t = [\Delta lp_t, li_t]'$
4. Two structural disturbances
   (a) ε_t^T:Technology shock
   (b) ε_t^{NT}:Nontechnology shock

5. Identification follows Galí (1999)
6. Technology shocks are sources of the unit root in labor productivity
7. Only technology shocks have a permanent effect
8. Distributed lag representation based on the technology and non-technology shocks (Galí and Gambetti, 2009)

$$x_{i,t} = \mu_t^i + \sum_{k=0}^{\infty} C_{t,k}^{i,T} \varepsilon_{t-k}^{T} + \sum_{k=0}^{\infty} C_{t,k}^{i,NT} \varepsilon_{t-k}^{NT}$$

9. Unconditional Variance

$$\text{Var}(x_{i,t}) = \sum_{k=0}^{\infty} (C_{t,k}^{i,T})^2 + \sum_{k=0}^{\infty} (C_{t,k}^{i,NT})^2$$

10. Unconditional Covariance

$$\text{Cov}(x_{i,t}, x_{j,t}) = \sum_{k=0}^{\infty} C_{t,k}^{i,T} C_{t,k}^{j,T} + \sum_{k=0}^{\infty} C_{t,k}^{i,NT} C_{t,k}^{j,NT}$$

Main results

1. Japanese output growth volatility has declined temporally in the middle of 1970s
   (a) Consistent with Stock and Watson (2005)
2. Main source of the volatility dynamics
   (a) Output and productivity growth: technology shock
   (b) Labor input: nontechnology shock
3. Relatively stable negative correlation between LI and LP
   cf. US: positive $\longrightarrow$ negative

Overall comments

1. Challenge important questions
2. High tech paper
3. Find many interesting results
4. Open up a lot of new research topics
5. Could provide more evidence
6. Should emphasize validity of the model

Comments

1. Order of integration for labor input
   (a) $x_t = [\Delta lp_t, li_t]' \sim I(0)$
   (b) $lp_t = y_t - li_t \sim I(1)$
   (c) $y_t \sim I(1)$
   (d) $y_t - lp_t = li_t \sim I(0)$
   (e) y_t and lp_t are cointegrated
   (f) Technology shocks are sources of the unit root in output as well
   (g) $x_t = [\Delta lp_t, \Delta li_t]' \sim I(0)$ may be more natural

2. Investigate the change and sources of short- and long-run fluctuations

   (a) Distributed lag representation based on the technology and non-technology shocks (Galí and Gambetti, 2009)

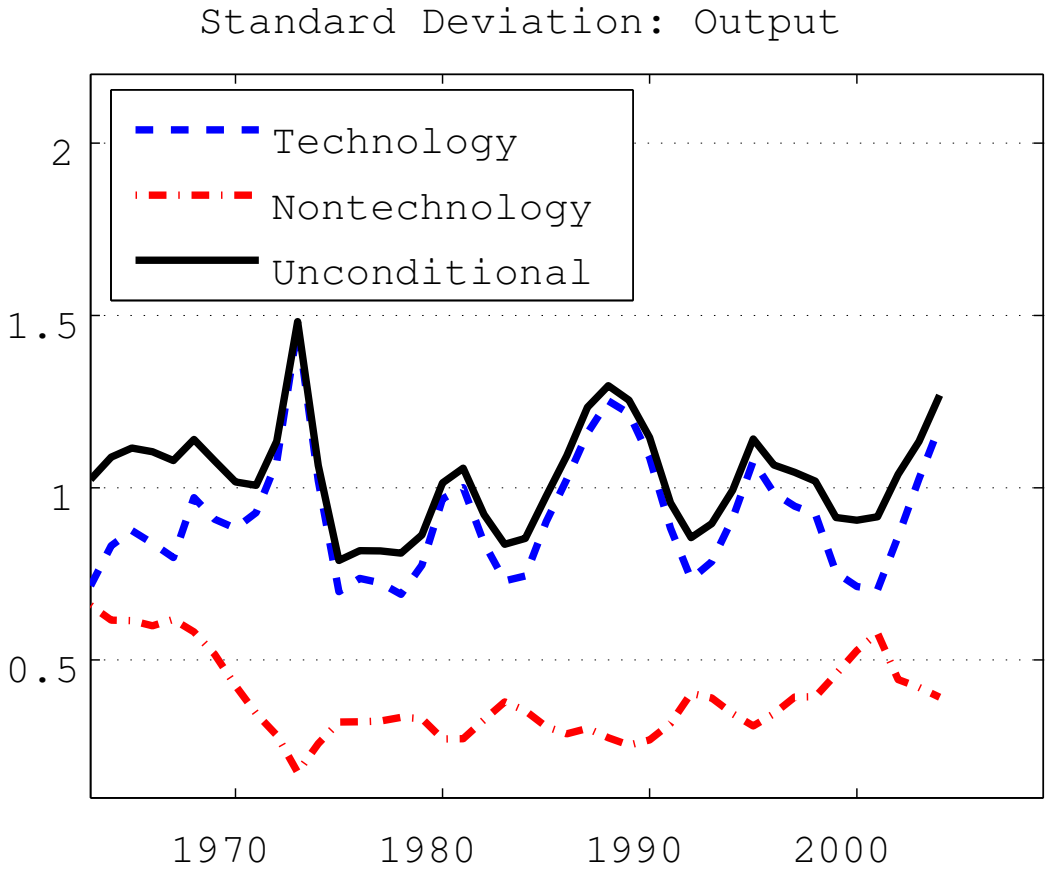
$$x_{i,t} = \mu_t^i + \sum_{k=0}^{\infty} C_{t,k}^{i,T} \varepsilon_{t-k}^a + \sum_{k=0}^{\infty} C_{t,k}^{i,NT} \varepsilon_{t-k}^d$$

   (b) MSE of h-quarter ahead forecast

$$\text{MSE}(\hat{x}_{i,t+h|t}) = \sum_{k=0}^{h-1} (C_{t,k}^{i,T})^2 + \sum_{k=0}^{h-1} (C_{t,k}^{i,NT})^2$$

   (c) The paper considers only the case for $h = \infty$

   (d) Could be more interesting to compare several cases
   Ex. $h = 1,\ 4,\ 12,\ 20$


Standard Deviation: Output
Technology
Nontechnology
Unconditional
2
1.5
1
0.5
1970
1980
1990
2000

3. Examine changes in impulse response function (IRF) more carefully

(a) Interesting figures for IRF

(b) No confidence intervals

(c) Too much information for one figure

(d) Use two dimensional figure with confidence intervals for several time horizon h
Ex. $h = 1,\ 4,\ 12,\ 20$

(e) Discuss significance of time variation of IRF

(f) Compare the results with different horizons

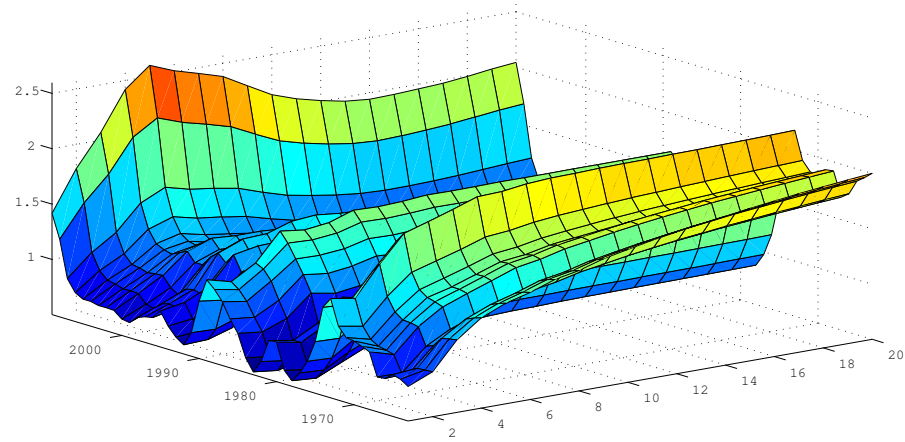


Fig. 7. Impulse Response of Output to Technology shocks.

4. Interpretation of nontechnology shock

(a) Little power to explain output volatility

(b) Induce almost perfect negative correlation between LI and LP throughout entire sample

(c) Negative IRF of LP to nontechnology shock

(d) Sign of IRF of output to nontechnology shock?

(e) Possible nontechnology shock

i. Monetary policy shock

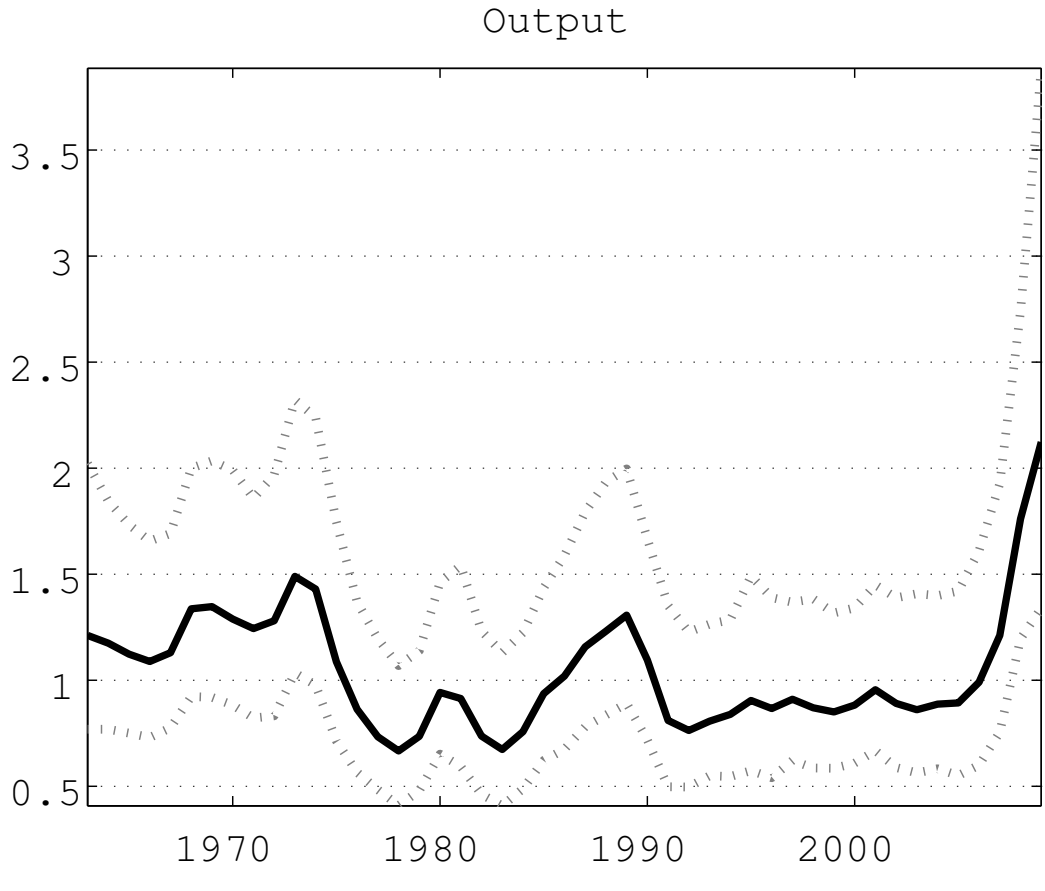
ii. Fiscal policy shock

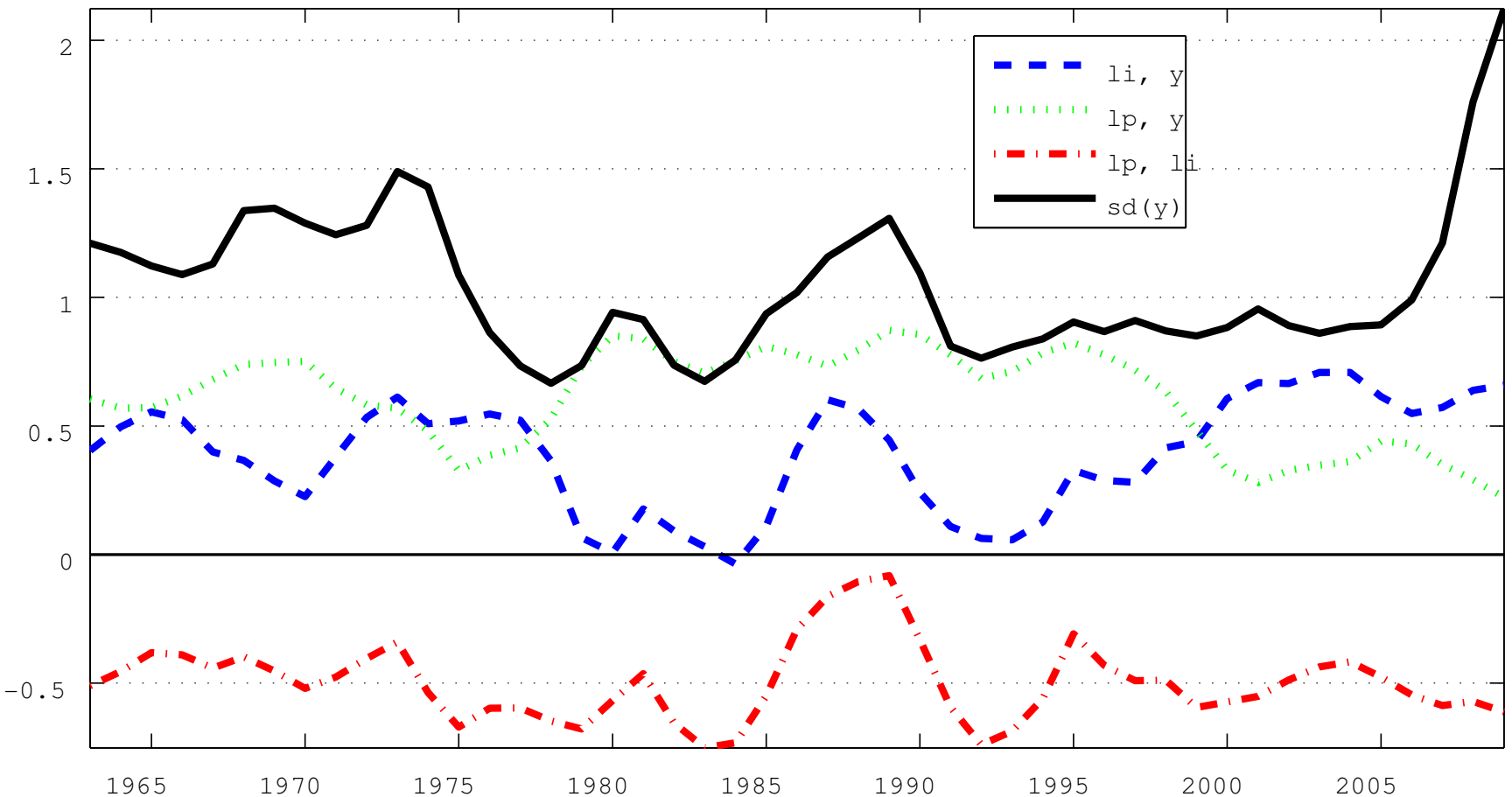
iii. Demand shock

(f) Nontechnology shock might have permanent effect on LP

(g) Extend the model to identify nontechnology shocks in detail

5. Significance of changes in volatility and correlations
   (a) 90% confidence interval for volatility is relatively wide
   (b) No confidence interval for correlation
   (c) Better have some test for structural change
   (d) Table 1 could be used
6. Little justification of the model
   (a) Comparison with other models
      i. VAR model with constant coefficient and volatility
      ii. VAR model with GARCH type disturbance
      iii. Markov switching VAR model
   (b) Calculation of marginal likelihood


Output
3.5
3
2.5
2
1.5
1
0.5
1970
1980
1990
2000


2
1.5
1
0.5
0
-0.5
1965
1970
1975
1980
1985
1990
1995
2000
2005
li, y
lp, y
lp, li
sd(y)

7. Interesting future research

   (a) Volatility dynamics for other macroeconomic variables

   (b) Good luck or good policy

   (c) Reason for a decline in technology shock volatility

   (d) Negative correlation between labor input and output

8. Minor comments

   (a) Length of rolling-window may be too short

   (b) Lag length?

   (c) Is it "Great Moderation?"

Conclusion

1. Valuable contribution for Japanese economic analysis
2. Powerful tool to detect changes in volatility and impulse response function
3. Find many interesting results
4. Open up a lot of new research topics
5. Can be applied to many macroeconomic series