

# Discussion of

## Asset Price Bubbles and Monetary Policy: A Multivariate Extension

This discussion expresses the view of an empirical asset pricing person who is an (intrigued) outsider of the discussion to which this paper contributes to.  
The views probably do not reflect the opinions of behavioral, evolutionary or non-rational finance persons ☺



Deutsche Bundesbank and ZEW Conference  
Mannheim, November 2006

# Why I like the paper

Work in progress, but clear storyline

Technically well conducted

High scope!

Dependent, recurring bubble processes

No beating around the bush: Clear (albeit controversial) conclusions

# Why I like the paper

Hot topic, words are not minced

Mopping up after asset pricing “bubble” collapsing by central banks fosters new bubble (stocks, housing, ...)

“Over the past six years, monetary authorities have turned the liquidity spigot wide open. This has given rise to an endless string of asset bubbles — from equities to bonds to property to risky assets ..... Central banks have ducked responsibility for this state of affairs. That could end up being a policy blunder of monumental proportions. A new approach to monetary policy is urgently needed.”

Stephen Roach, global economist at Morgan Stanley, Morgan Stanley **Global Economic Forum**, Wake-Up Call for Central Banking May 22, 2006

Endless (!) string of “bubbles” caused by central banks not reacting towards “bubbles”

**This paper formalizes the issue (highly commendable)**

# Modelling of multivariate asset price dynamics in macro model

*Macro block*

$$(IS) \quad y_t = -\gamma r_{t-1} + \theta_y y_{t-1} + \boldsymbol{\varphi}(\boldsymbol{\pi}_{AP,t-1} - \boldsymbol{\pi}_{t-1}) + \varepsilon_t$$

$$(PC) \quad \pi_t = \pi_{t-1} + \alpha y_{t-1} + \boldsymbol{\beta} \boldsymbol{\pi}_{NF,t-1} + \eta_t$$

fundamental component of asset prices

*Asset price block*

$$(AP) \quad \boldsymbol{\pi}_{AP,t} = \boldsymbol{\pi}_{F,t} + \boldsymbol{\pi}_{NF,t}$$

$$(F) \quad \boldsymbol{\pi}_{F,t} = \begin{pmatrix} \pi_{F,t}^e \\ \pi_{F,t}^h \end{pmatrix} = i \pi_{t-1} + \begin{pmatrix} \lambda^e \\ \lambda^h \end{pmatrix} y_{t-1} + \begin{pmatrix} v_t^e \\ v_t^h \end{pmatrix}$$

$$(B) \quad \boldsymbol{\pi}_{B,t} = \begin{pmatrix} \pi_{B,t}^e \\ \pi_{B,t}^h \end{pmatrix} = \zeta_t(y_{t-1}, r_{t-1})$$

nonfundamental (**bubble**)  
component of asset prices

$$L = \text{var}(y) + \mu_\pi \text{var}(\pi) + \mu_r \text{var}(r - r_{-1})$$

$$r_t = a_y y_t + a_\pi \pi_t + \mathbf{a}_F \boldsymbol{\pi}_{F,t} + \mathbf{a}_{NF} \boldsymbol{\pi}_{NF,t}$$

# The results for the bivariate bubble model

	TVTP specification			FTP specification*
	No asset price response	Constrained response to asset price components	Differential response to fundamental and non-fundamental asset prices	
	(col 2)	(col 3)	(col 4)	(col 5)
$a_y$	1.30 (.01)	1.28 (.01)	1.28 (.01)	1.28 (.01)
$a_\pi$	2.18 (.05)	1.31 (.12)	1.30 (.12)	1.03 (.04)
$a_F^e$	—	.49 (.01)	.55 (.01)	.58 (.01)
$a_{NF}^e$	—	—	.05 (.02)	.58 (.01)
$a_F^h$	—	.55 (.01)	.55 (.01)	
$a_{NF}^h$	—	—	.55 (.02)	

# Should the central bank respond to movement in asset prices

The verdict: AER (2001)

Should Central Banks Respond to Movements in Asset Prices?

*By BEN S. BERNANKE AND MARK GERTLER\**

Inflation targeting approach: „Changes in asset prices should affect monetary policy only to the extent that they affect the central bank’s inflation forecast“

....even if bubbles exist.

Daisy cutter: No bubble paper published after that (in leading journals)

**Paper fights an uphill battle!**

# Paper fights an uphill battle

Existence of bubbles

What is a bubble in the first place ? (ex post and ex ante)

Rational/irrational bubbles exogenous/endogenous bubbles

## Asset pricing literature (non-behavioral)

Cochrane (2005) (4 pages on **rational** bubbles)

Singleton (2006) (no reference)

# Methodological concerns

Bernanke/Gertler and afterwards:

Assess optimality of monetary policy within given framework and asset pricing model

**Conclusions regarding optimal monetary policy depend on asset pricing process**

It is all about asset pricing, but asset pricing **theory** is largely neglected.

Ok, if asset pricing process does not matter, but ..

Base monetary policy on not well understood asset pricing model?



# **We are too worried about a model for the fundamentals to think about a model for bubbles**

Recent synopses of 40 years of (macro) asset pricing

Link macro risk factors and asset prices not established  
(equity premium puzzle, interest rate puzzle)

Theoretically appealing models don't work empirically

Empirically successful models (Fama/French) not theoretically appealing

Recent successes (Yogo, 2006, Lettau/Ludvigson (2000) Garcia et al (2004)),  
State variables, habit, non-separable utility functions, heterogeneous agents)

Goal: Establish link between macro risk factors and asset pricing

## A moratorium?

Revive the issue on central bank response to asset prices when asset pricing theory has come up with theoretically appealing and empirically successful model

If this model contains bubbles, they should be endogenous (and rational)


# Methodological concerns

Bernanke/Gertler and ex post

Optimality of monetary policy within given framework

It is all about asset pricing, but asset pricing theory is largely neglected.



- \* reaction parameter of output is fairly similar across specifications
  - \* response to inflation is more aggressive if asset response is not allowed for
-  allowing for response to asset prices is a good approach
- \* response on average for asset prices (equity bubble) is higher if central bank can not distinguish between fundamental and bubble components

however, weighed against the cost of identifying asset price bubbles (difficult!)

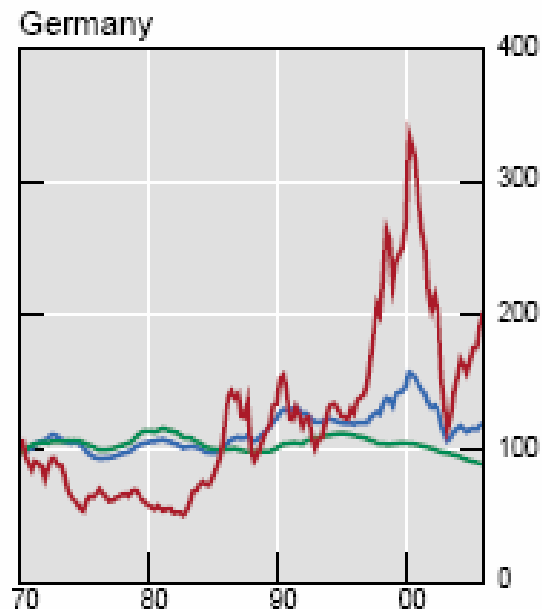
- \* response to housing bubbles is nearly the same for distinction between F and NF or not

# Assessment and some recommendations on the exposition

- paper miss its target to give concrete policy advice
- paper criticizes the delay in reacting to bubbles... Does the model really deliver a policy advice concerning the „right“ timing for policy strategies?
- is a multivariate version necessary?
- check notation

# Some methodological concerns

- no theory for the asset pricing equation-> motivation?
- no theory for the stochastic bubble process, however, it fulfills the aim to provide a model that is able to deal with endogenous, fully dynamic, recurring process for multivariate bubbles processes
- symmetry of positive and negative rate of change in asset prices due to the bubble component -> realistic?



The model setup requires some key assumptions about bubbles

- How do bubbles arise -> existence of bubbles
- How to measure bubbles, how to identify them? what triggers them?
- ex-post identification
- bubbles in housing prices
- assume that bubbles influence key macroeconomic variables
- equity price bubbles are followed by housing price bubbles (only for the third specification/temporal ordering in bubbles)
- Does the model really deliver a policy advice concerning the „right“ timing for policy strategies
- paper criticizes the delay in reacting to bubbles, however, does the model really deliver a policy advice concerning the „right“ timing for policy actions?

Three model specifications for the nonfundamental components of asset prices: Fixed TP vs. Time varying TP

$$\mathbf{P}_{-1,0,1}^i = \begin{pmatrix} p_{-1,-1}^i & p_{-1,0}^i & 0 \\ p_{0,-1}^i & p_{0,0}^i & p_{0,1}^i \\ 0 & p_{1,0}^i & p_{1,1}^i \end{pmatrix}, \text{ for } i \in \{e, h\}$$

Fixed transition probabilities:

$$\pi_{B,t}^i = \theta_p^i \quad \text{with probability } p_{1,1}^i, \text{ given } s_{t-1}^i = 1$$

Time varying transition probabilities (TVTP) with indirect effects of housing and equity bubbles

Time varying transition probabilities (TVTP) with direct effects of housing and equity bubbles

$$\pi_{B,t}^i = \theta_p^i \quad \text{with probability } p_{1,1}^i(X_{t-1}), \text{ given } s_{t-1}^i = 1$$

->Time varying transistion probablities reduce the loss of central banks