MONETARY POLICY RULES AND MACROECONOMIC STABILITY: EVIDENCE AND SOME THEORY

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OUTLINE

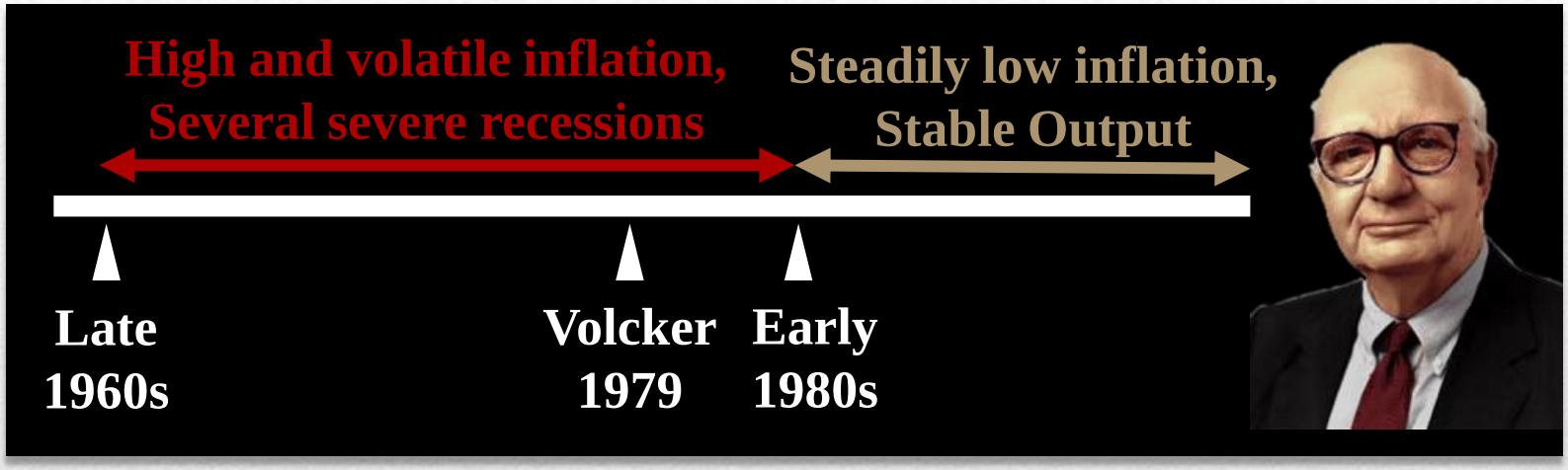
I. INTRODUCTION

II. THE FED'S POLICY REACTION FUNCTION: MODEL

III. THE FED'S POLICY REACTION FUNCTION: EVIDENCE

IV. INTEREST RATE RULES AND ECONOMIC FLUCTUATIONS

INTRODUCTION



Possible Causes

> Supply Shock (?)

> Different conduct of monetary policy

THE FED'S POLICY REACTION FUNCTION: THE MODEL

REACTION FUNCTION: MODEL

- **Fed funds rate** as the instrument of monetary policy

The Baseline Policy Rule

$$r_t^* = r^* + \beta\left(E\{\pi_{t,k}|\Omega_t\} - \pi^*\right) + \gamma E\{x_{t,q}|\Omega_t\}$$

$r_t^* = target\ rate\ for\ the\ nominal\ Fed\ funds\ rate\ in\ period\ t$

$\pi_{t,k} = percent\ change\ in\ price\ level\ btw\ period\ t\ and\ t+k$

$\pi^* = target\ inflation$

$x_{t,q} = measure\ of\ average\ output\ gap\ btw\ period\ t\ and\ t+q$

$\Omega_t = information\ set\ at\ the\ time\ the\ interest\ rate\ is\ set$

REACTION FUNCTION: MODEL

Interest Rate Smoothing

$$r_t = \rho(L) r_{t-1} + (1-\rho) r_t^*$$

r_t = actual Fed funds rate

r_t^* = target rate for nominal Fed funds rate

$$\rho(L) = \rho_1 + \rho_2 L + \cdots + \rho_n L^{n-1}$$

THE FED'S POLICY REACTION FUNCTION: THE EVIDENCE

REACTION FUNCTION: THE EVIDENCE

THE DATA

Quarterly time series from 1960:1 to 1996:4

> 1960:1 – 1979:2 Pre-Volcker

> 1979:3 – 1996:4 Volcker-Greenspan

Baseline Measures

- Inflation

> annualized rate of change of GDPP btw 2 subsequent quarters

- Output Gap

> the series constructed by CBO

REACTION FUNCTION: THE EVIDENCE

TABLE I AGGREGATE VOLATILITY INDICATOR

	Standard Deviation of:			
	Inflation		Output	
	Level	*hp*	*Gap*	*hp*
Pre-Volcker	2.77	1.48	2.71	1.83
Volcker-Greenspan	2.18	0.96	2.36	1.49
post–82	1.00	0.79	2.06	1.34

REACTION FUNCTION: THE EVIDENCE

TABLE II BASELINE ESTIMATES

	π^*	β	γ	ρ	p
Pre-Volcker	4.24	0.83	0.27	0.68	0.834
	(1.09)	(0.07)	(0.08)	(0.05)	
Volcker-Greenspan	3.58	2.15	0.93	0.79	0.316
	(0.50)	(0.40)	(0.42)	(0.04)	

The model is not rejected for any specifications or sample periods.

Beta is significantly lower than 1 for the pre-Volcker period and far greater than 1 in the Volcker-Greenspan period.

ROBUSTNESS ANALYSIS

TABLE III ALTERNATIVE VARIABLES

	π^*	β	γ	ρ	p
Detrended output					
Pre-Volcker	4.17	0.75	0.29	0.67	0.801
	(0.68)	(0.07)	(0.08)	(0.05)	
Volcker-Greenspan	4.52	1.97	0.55	0.76	0.289
	(0.58)	(0.32)	(0.30)	(0.05)	
Unemployment rate					
Pre-Volcker	3.80	0.84	0.60	0.63	0.635
	(0.87)	(0.05)	(0.11)	(0.04)	
Volcker-Greenspan	4.42	2.01	0.56	0.73	0.308
	(0.44)	(0.28)	(0.41)	(0.05)	
CPI					
Pre-Volcker	4.56	0.68	0.28	0.65	0.431
	(0.53)	(0.06)	(0.08)	(0.05)	
Volcker-Greenspan	3.47	2.14	1.49	0.88	0.138
	(0.79)	(0.52)	(0.87)	(0.03)	

ROBUSTNESS ANALYSIS

TABLE IV ALTERNATIVE HORIZONS

	π^*	β	γ	ρ	p
$k = 4, q = 1$					
Pre-Volcker	3.58	0.86	0.34	0.73	0.835
	(1.42)	(0.05)	(0.08)	(0.04)	
Volcker-Greenspan	3.25	2.62	0.83	0.78	0.876
	(0.23)	(0.31)	(0.28)	(0.03)	
$k = 4, q = 2$					
Pre-Volcker	3.32	0.88	0.34	0.73	0.833
	(1.80)	(0.06)	(0.09)	(0.04)	
Volcker-Greenspan	3.21	2.73	0.92	0.78	0.886
	(0.21)	(0.34)	(0.31)	(0.03)	

TABLE V SUBSAMPLE STABILITY

	π^*	β	γ	ρ	p
Martin					
(1,1)	5.16	0.86	0.14	0.77	0.524
	(1.72)	(0.08)	(0.16)	(0.06)	
(4,1)	7.15	0.92	0.06	0.72	0.719
	(5.55)	(0.08)	(0.07)	(0.05)	
Burns-Miller					
(1,1)	5.16	0.86	0.78	0.69	0.524
	(1.72)	(0.08)	(0.18)	(0.04)	
(4,1)	7.15	0.92	1.24	0.80	0.719
	(5.55)	(0.08)	(0.39)	(0.05)	
Volcker					
(1,1)	3.75	2.02	−0.02	0.63	0.612
	(0.28)	(0.23)	(0.15)	(0.04)	
(4,1)	2.45	2.38	0.68	0.74	0.804
	(0.47)	(0.35)	(0.30)	(0.04)	
Greenspan					
(1,1)	3.75	2.02	0.99	0.63	0.612
	(0.28)	(0.23)	(0.18)	(0.04)	
(4,1)	2.45	2.38	0.68	0.91	0.804
	(0.47)	(0.35)	(0.30)	(0.02)	
Post-82					
(1,1)	3.43	1.58	0.14	0.91	0.416
	(1.24)	(0.72)	(0.42)	(0.03)	
(4,1)	3.16	3.13	0.09	0.82	0.894
	(0.10)	(0.33)	(0.15)	(0.02)	

ROBUSTNESS ANALYSIS

TABLE VI BACKWARD-LOOKING ESTIMATES

	π^*	β	γ	ρ	p
Pre-Volcker	5.95	0.86	0.39	0.68	0.590
	(1.92)	(0.07)	(0.08)	(0.05)	
Volcker-Greenspan	4.08	1.72	0.34	0.71	0.307
	(0.56)	(0.28)	(0.19)	(0.05)	
Post-82	2.96	2.55	−0.15	0.89	0.486
	(0.27)	(0.56)	(0.28)	(0.03)	

INTEREST RATE RULES AND ECONOMIC FLUCTUATIONS

A BASELINE MODEL: NEW KEYNESIAN STICKY PRICE

$$\pi_t = \delta E\{\pi_{t+1}|\Omega_t\} + \lambda (y_t - z_t)$$

$$y_t = E\{y_{t+1}|\Omega_t\} - (1/\sigma)(r_t - E\{\pi_{t+1}|\Omega_t\}) + g_t$$

$$r_t^* = \beta E\{\pi_{t+1}|\Omega_t\} + \gamma x_t$$

$$r_t = \rho r_{t-1} + (1 - \rho) r_t^*.$$

INTEREST RATE RULES AND ENDOGENOUS FLUCTUATIONS

Pre-Volcker Rule, Beta < 1

Anticipated inflation increases

↓

Real interest rate decreases

↓

Stimulates AD

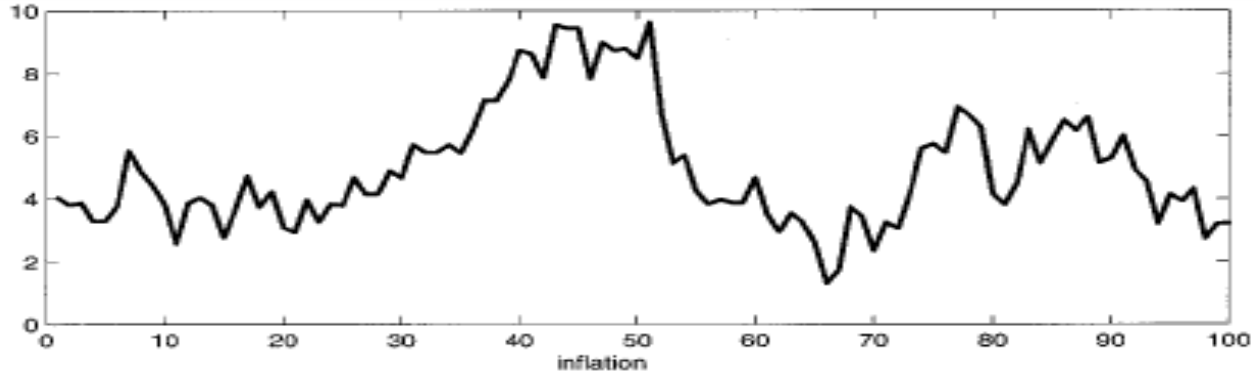
↓

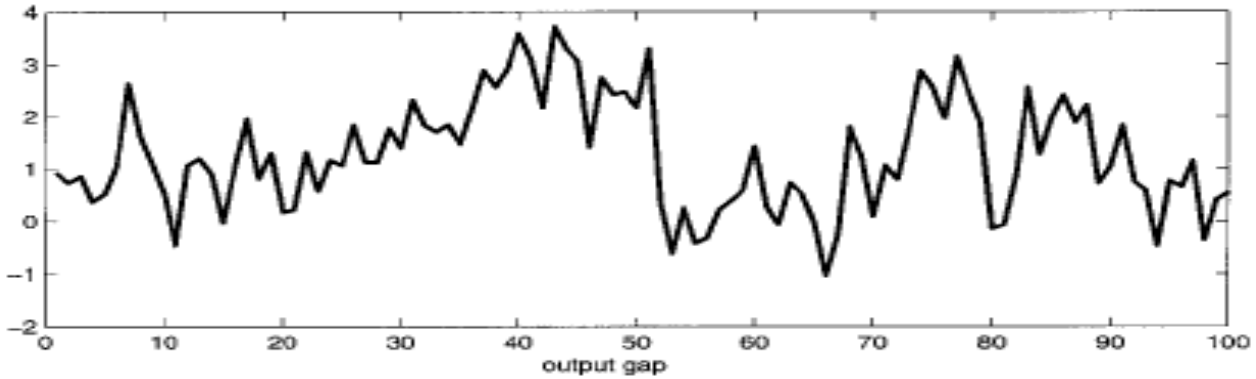
Inflation increases

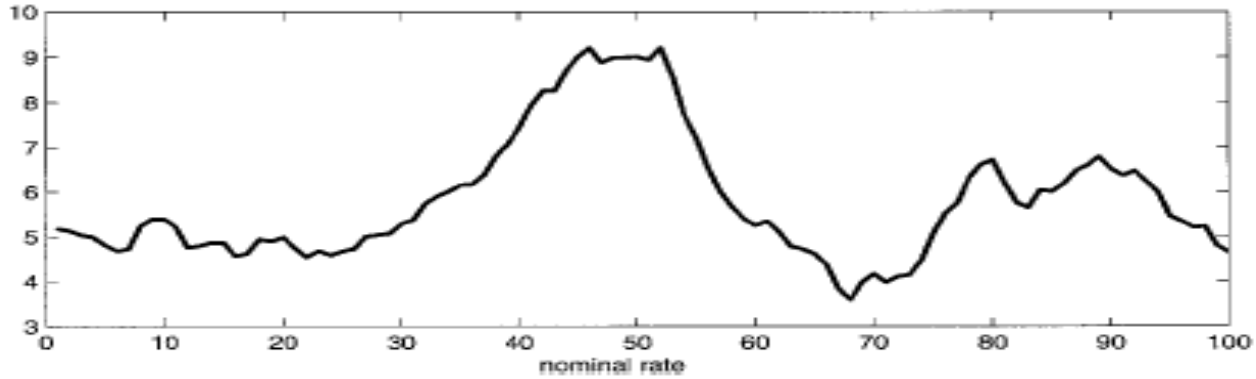
Self-fulfilling revisions in inflationary expectation

"Sunspot Shock"

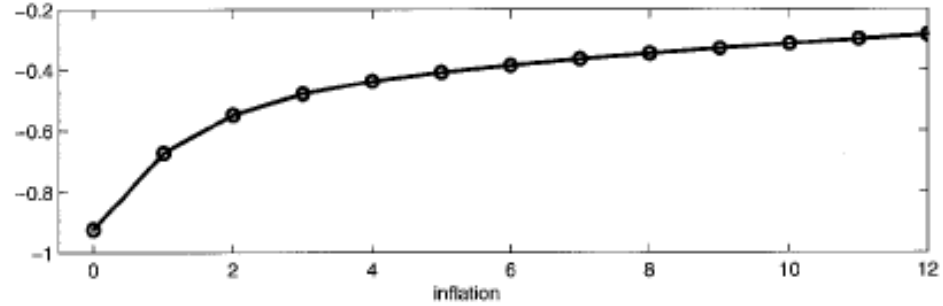
Simulated Sunspot Fluctuation under Pre-Volcker Rule

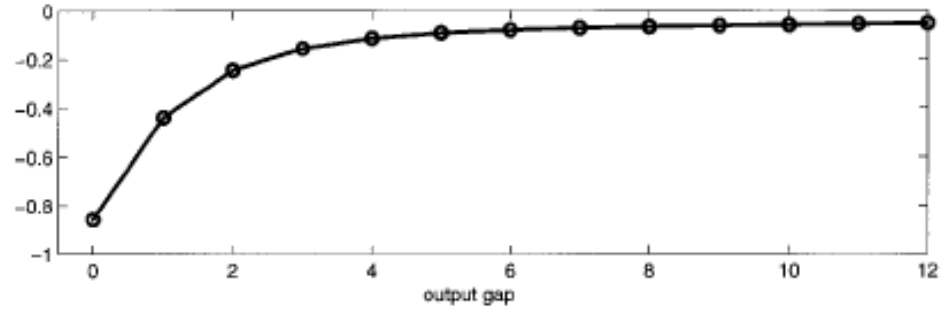


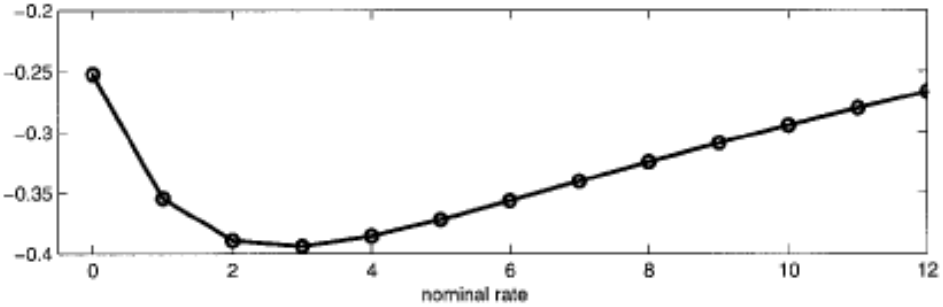


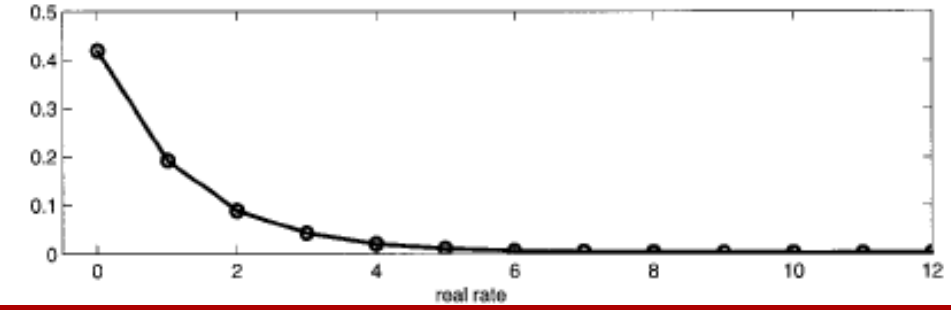


Impulse Responses to a Sunspot Shock







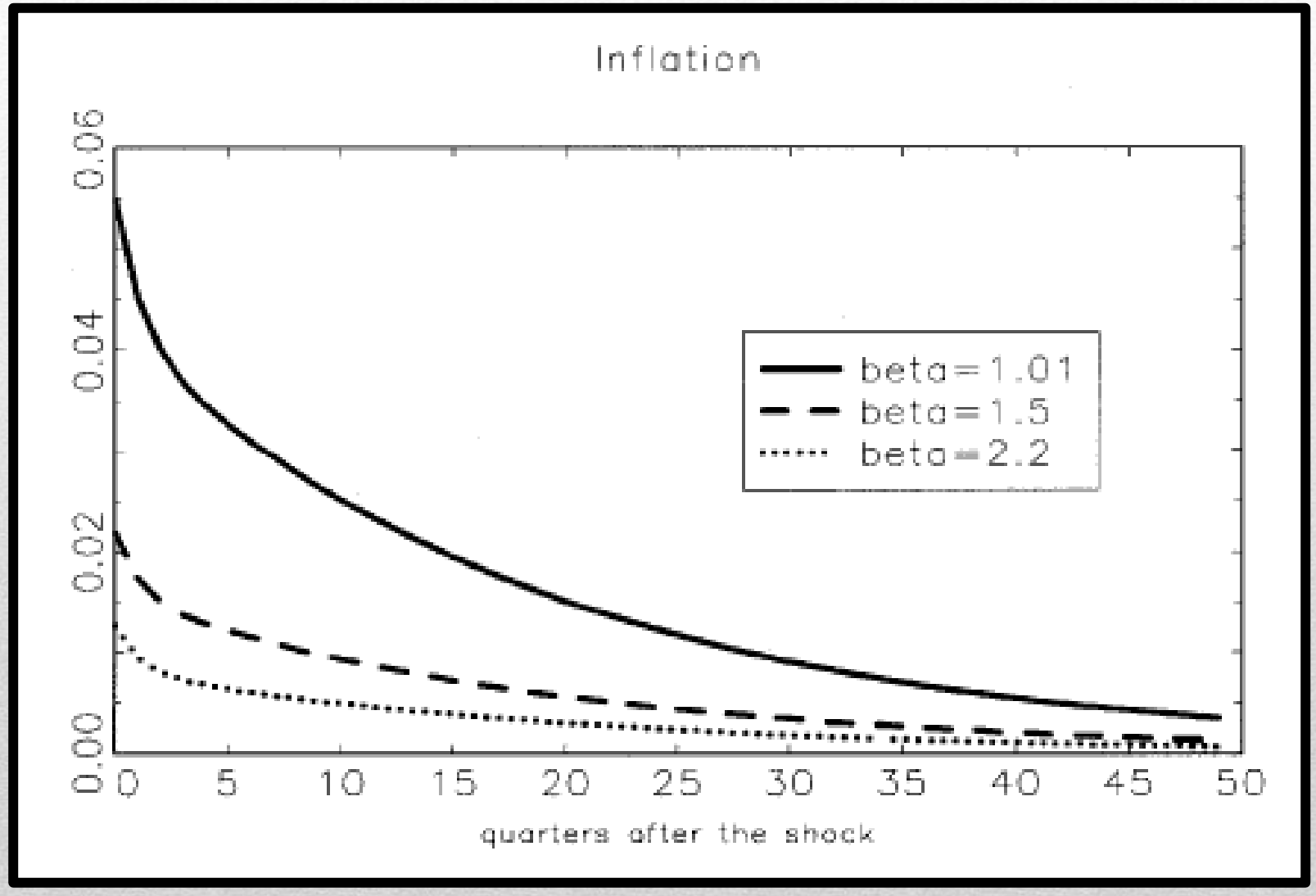


FUNDAMENTAL SHOCKS

TABLE VII
FUNDAMENTAL SHOCKS

	Supply shocks			Demand shocks	
β	$\sigma(\pi)$	$\sigma(x)$	$\sigma(y)$	$\sigma(\pi)$	$\sigma(y)$
2.0	1.00	1.00	1.00	1.00	1.00
1.5	1.48	1.36	1.29	1.61	1.67
1.1	2.57	2.16	2.26	3.04	1.96
1.0	3.20	2.61	2.88	3.88	4.25

FUNDAMENTAL SHOCKS



CONCLUSION

There is a difference between the monetary policy rule pre and post-1979

>>stronger anti-inflationary stance(beta >>1) in the latter period

>>Volcker was successful in combating inflation.

The pre-Volcker rule may lead to the US macroeconomic instability in the late sixties and seventies.

>> beta < 1 → vulnerable to sunspot shock