Insights into Income Policy for Enhancing Employment and Stability of Capital Accumulation

©**Alexander V. RYZHENKOV**

Institute of Economics and Industrial Engineering
Siberian Branch of Russian Academy of Sciences
17 Lavrentiev Avenue Novosibirsk 630090 Russia

ryzhenko@ieie.nsc.ru

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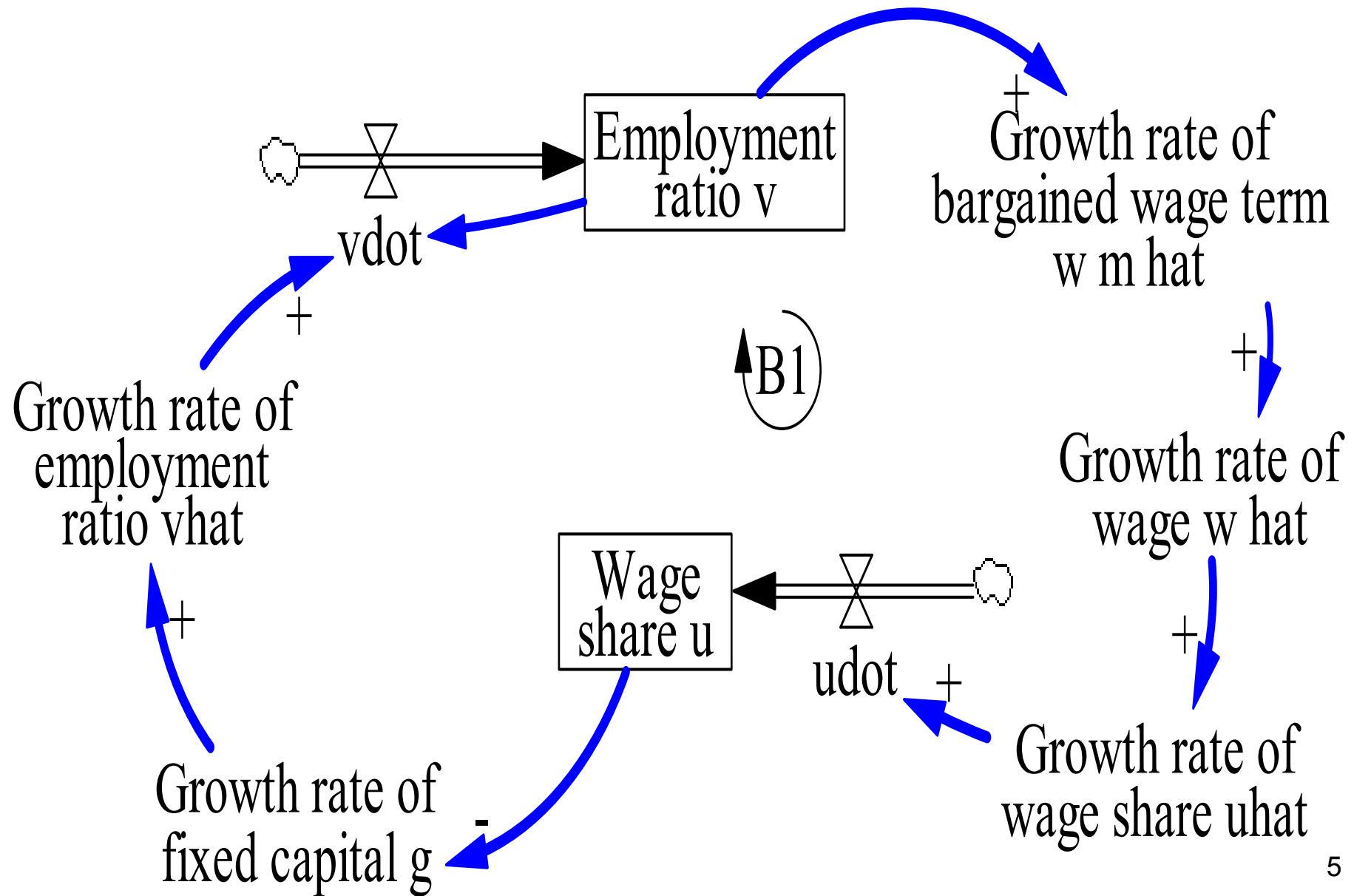
LGM-I belongs to best Goodwinian models

The Lordon model, named LGM-I, is intellectual achievement. It explains endogenous cycle of capital accumulation similar in important aspects to the Marx industrial cycle.

This and subsequent models provide extreme conditions tests of structural robustness of policy rules developed by the author of present paper for more sophisticated and realistic models.
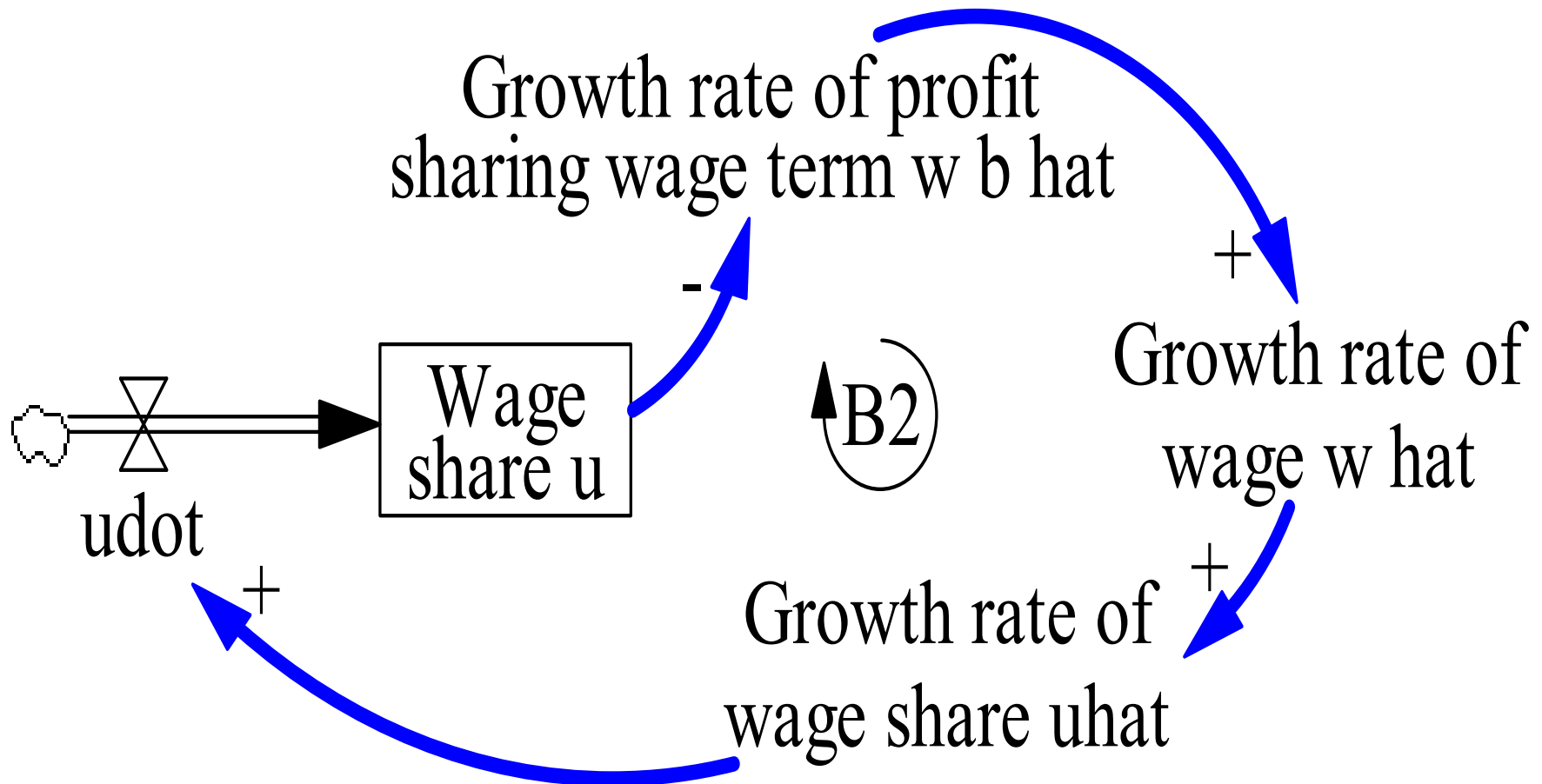
The causal structure of LGM-I

Growth rate of bargained wage term w m hat

Employment ratio v

vdot

+

Growth rate of employment ratio vhat

B1

Growth rate of profit sharing wage term w b hat

−

Wage share u

udot

+

Growth rate of wage w hat

+

+

+

B2

−

R2

+

Growth rate of fixed capital g

Growth rate of wage share uhat

+

+

+

R1

−

−

Profit rate r

Growth rate of output per worker a hat

4
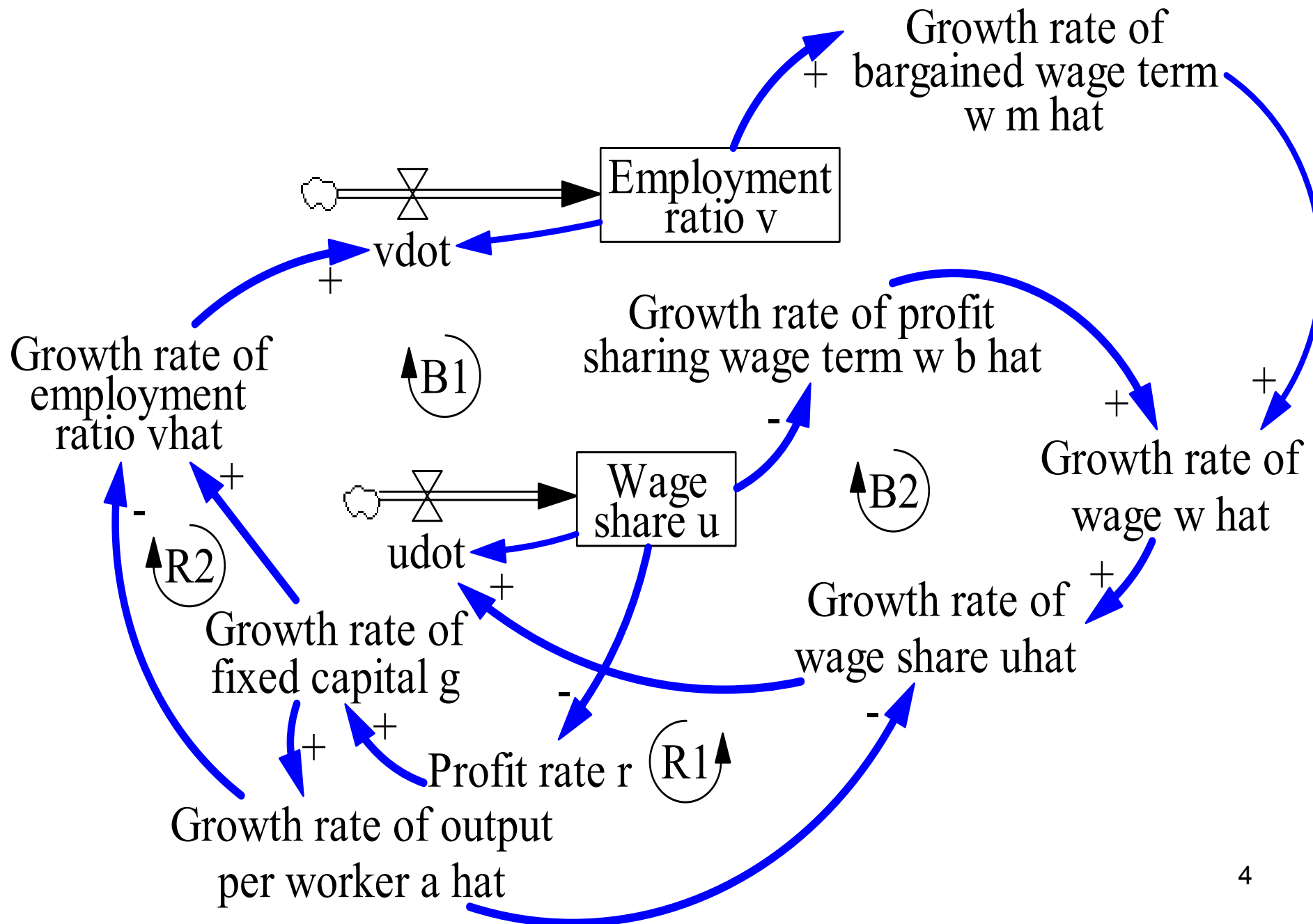
The first negative loop of 2nd order in LGM-I

Employment
ratio v

vdot

Growth rate of
bargained wage term
w m hat $+$

Growth rate of
wage w hat

Growth rate of
employment
ratio vhat $+$

B1

$+$

$+$

Wage
share u

udot $+$

$+$

Growth rate of
fixed capital g $-$

Growth rate of
wage share uhat

The second negative loop of 1ˢᵗ order in LGM-I

Growth rate of profit
sharing wage term w b hat

Growth rate of
wage w hat

Wage
share u

udot

B2

Growth rate of
wage share uhat

-

+

+

+

6

The first positive loop of 1ˢᵗ order in LGM-I
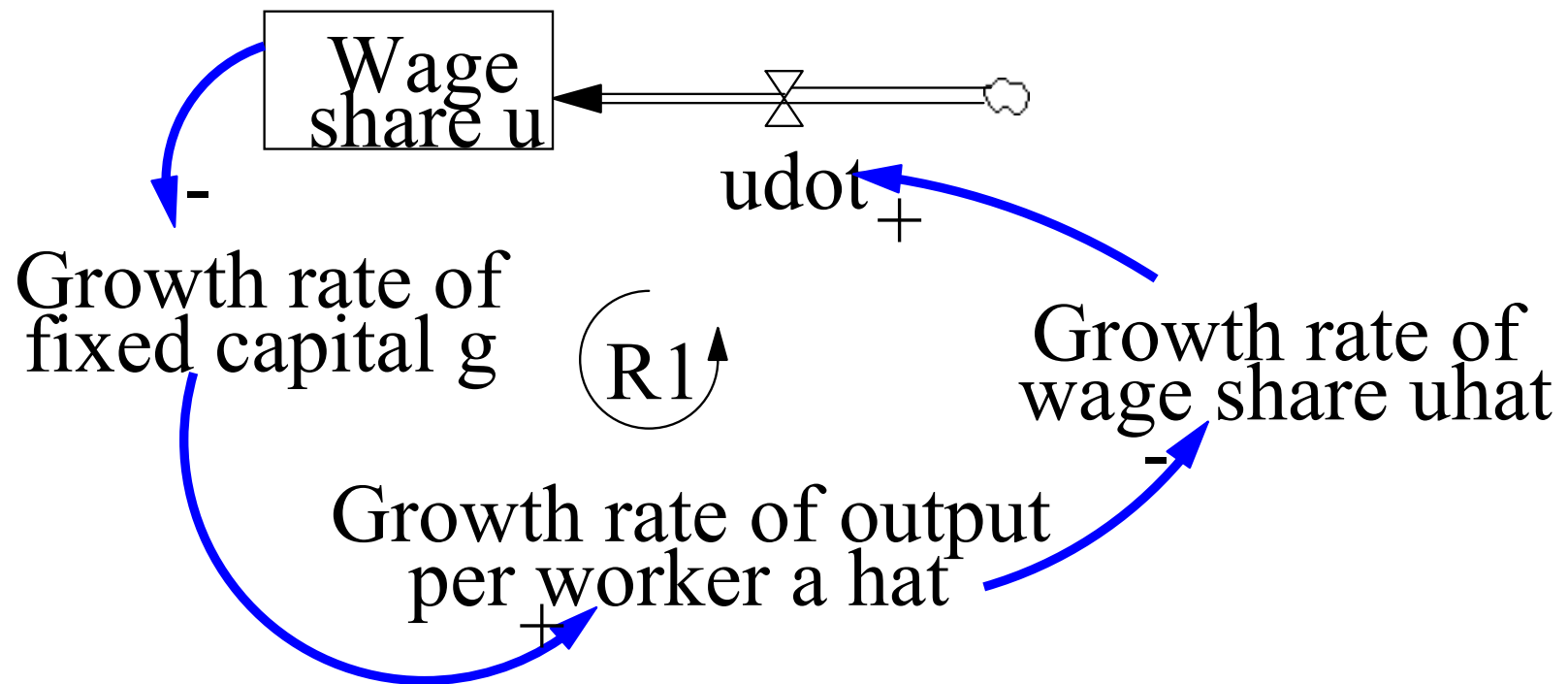
The second positive loop of 2nd order in LGM-I

Employment ratio v

+ Growth rate of bargained wage term w m hat

vdot +

+ Growth rate of wage w hat

Growth rate of employment ratio vhat

R2

-

Wage share u

udot +

Growth rate of wage share uhat [8]

Growth rate of output per worker a hat +

- Growth rate of fixed capital g
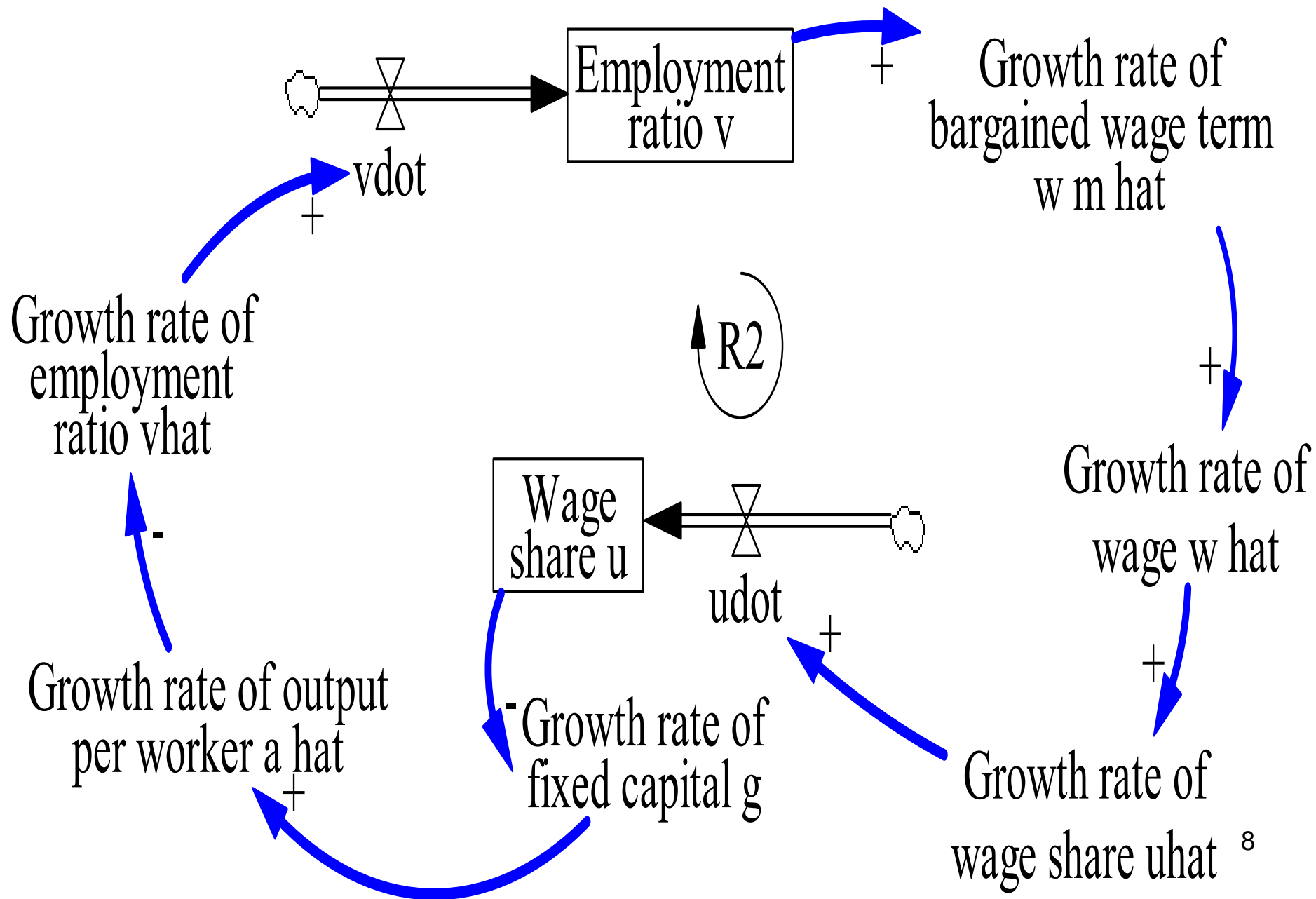
Dynamics near limit cycle in LGM-I and LGM-II

Variable	Crisis	De-pression	Recov-ery	Boom
Profit rate r	min	r^*	max	r^*
Surplus value S	min	S^*	max	S^*
Employ-ment ratio v	v^*	min	v^*	max

* means stationary magnitude

Over-accumulation of capital

Relative over-accumulation of capital:
growing capital (K) is accompanied by declining profit rate of   profit (r).
In LGM-I, a declining profit rate of ↔growing relative wage.
Two forms (I) and (II) of absolute excess of capital:
I) the increased capital (K) produced just as much, or even less, profit (M) than it did before its increase.
II) the increased capital (K) produced just as much, or even less, surplus value (S) than it did before its increase.

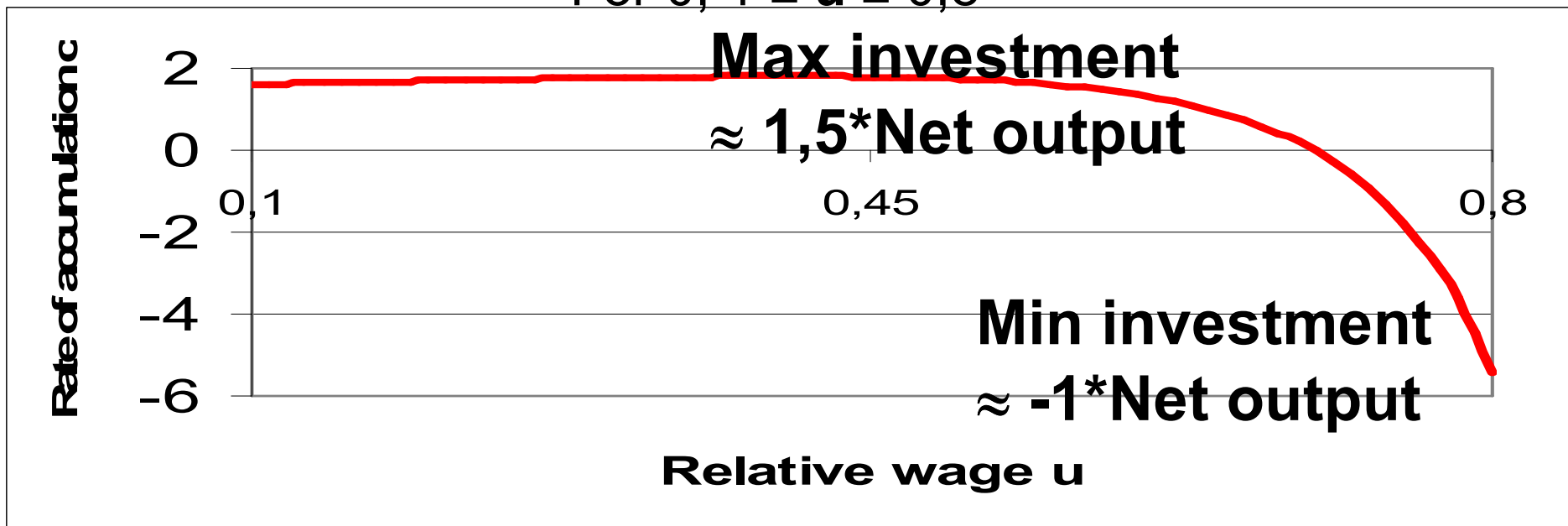# Relative → Absolute II → Absolute I capital over-accumulation near limit cycle
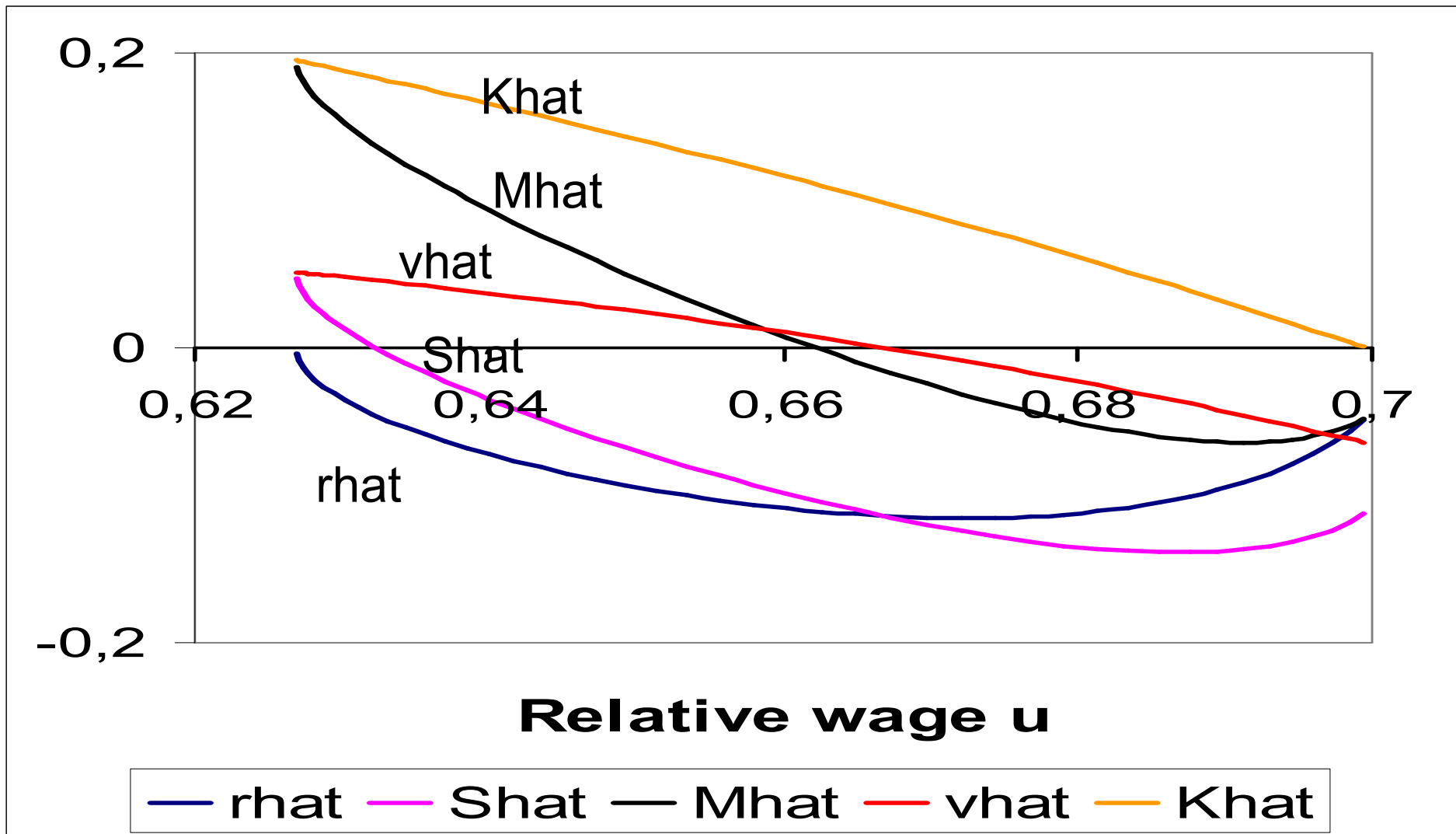
From l. to r., u goes up from u_{min} to $u_c = \omega$ (42% of the cycle period)

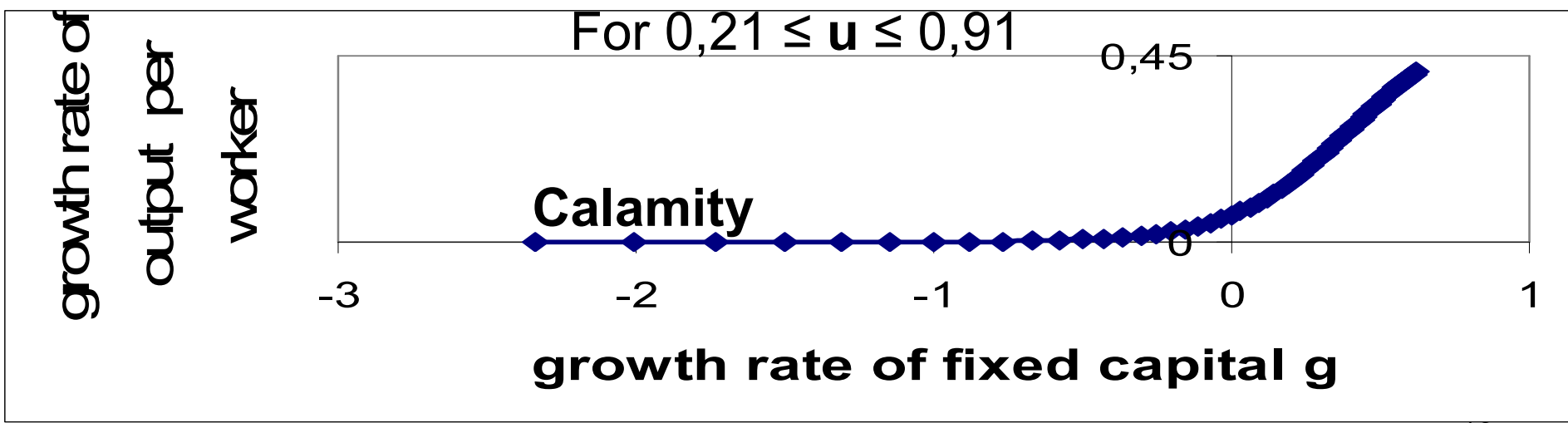# Some doubtful relationships in LGM-I

- Constancy of capital-output ratio, constant labour supply
- Negative dependence of growth rate of capital intensity on unit labour value
- No workers' competition for jobs
- A surrogate Kaldor – Verdoorn relation between growth rates of fixed capital and output per worker
- Excessive destruction of fixed capital by crises of over-production – to be cured in LGM-II and LGM-III

# Possibilities of investment glut and dearth in LGM-I

For 0, 1 ≤ **u** ≤ 0,8

Rate of accumulation c

2

0

0,1   0,45   0,8

-2

-4

-6

Max investment

≈ 1,5*Net output

Min investment

≈ -1*Net output

Relative wage u

For 0,21 ≤ **u** ≤ 0,91

growth rate of output per worker

0,45

Calamity

0

-3   -2   -1   0   1

growth rate of fixed capital g

Relative wage (**u**), investment ratio (**c**) and growth rate of fixed capital (**g**) in **LGM-I** and **LGM-II** for relative wage 0,1 ≤ **u** ≤ 0,8
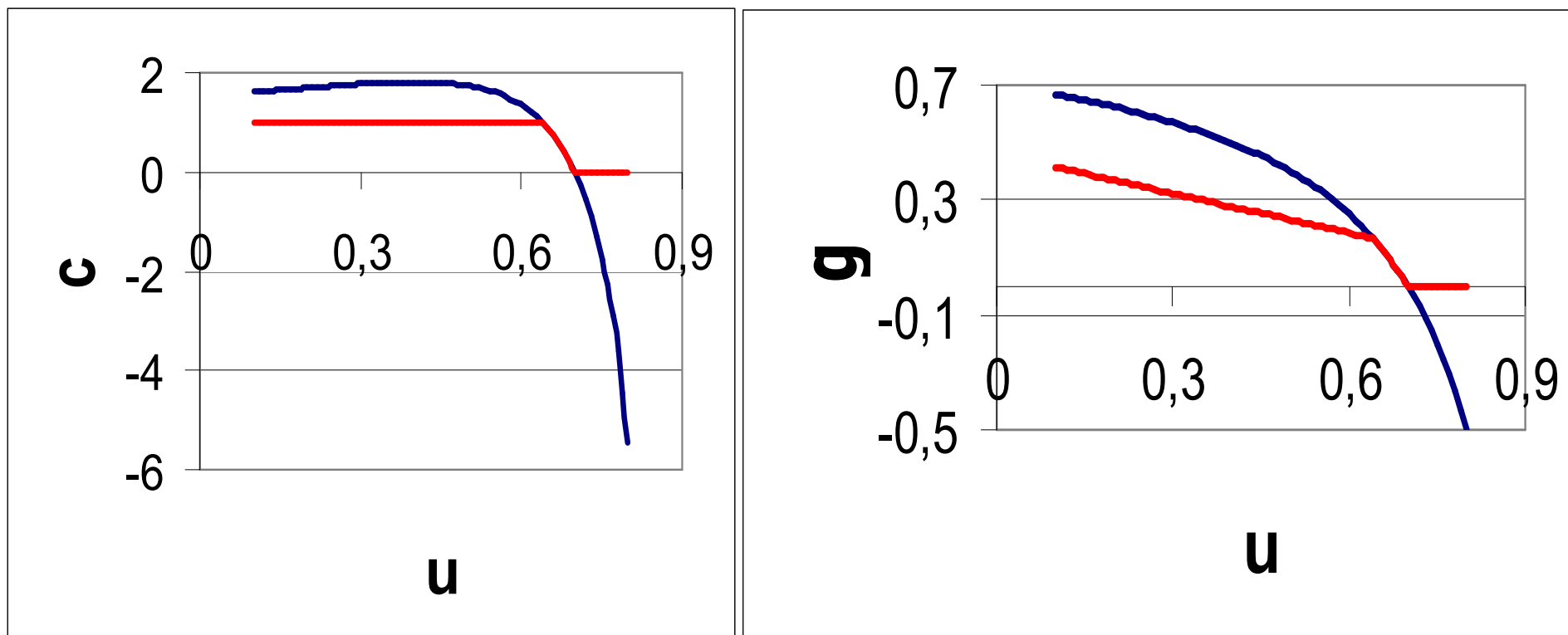
Local equivalence of LGM-I and LGM-II dynamics, still transients to distant attractors differ.

Bargaining and profit sharing in LGM-I & LGM-II

Growth rate of real wage sums up two terms

$$\hat{W} = \hat{w}^m + \hat{w}^b. \tag{3}$$

Wage-bargained term

$$\hat{w}^m = \gamma(v) - \pi_b, \tag{4}$$

$\pi_b = const$; the 1st and 2nd derivatives of $\gamma(v)$ are positive; profit-sharing term

$$\hat{w}^b = \eta(r) = \delta(u) + \pi_b, \tag{5}$$

$\eta'_r > 0$ and $\delta'_u < 0$,

$$\delta(u) = -\delta u + \pi, \tag{19}$$

$\delta > 0$.

Policy optimization in scenario II based on LGM-II

$$Maximise\left[-\int_{1}^{16}|v-X|dt\right]$$

subject to

$$\dot{x}=f_{restricted}[x(t),\delta,\pi],$$

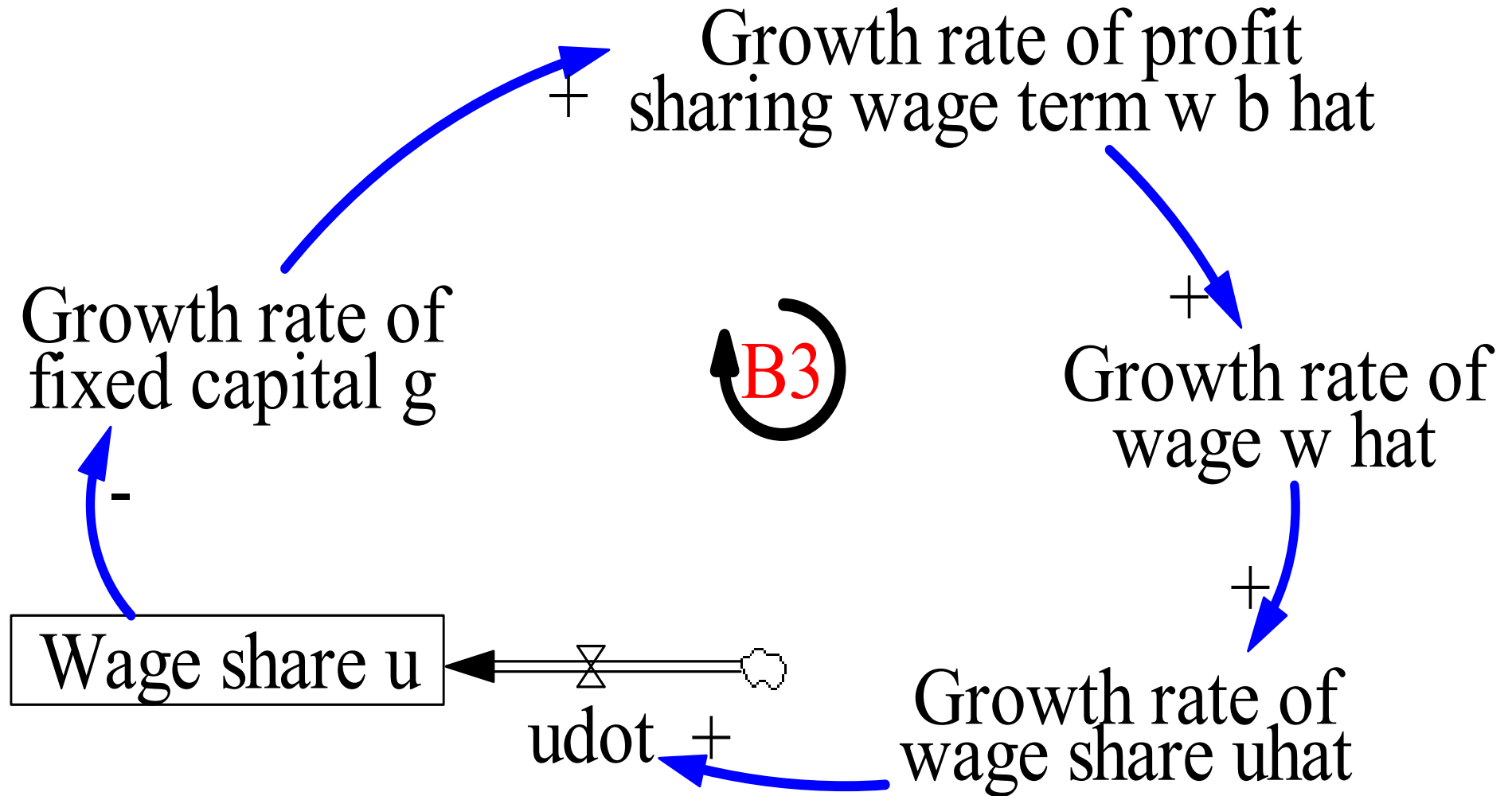given initial $x_0, X = 0,95,$
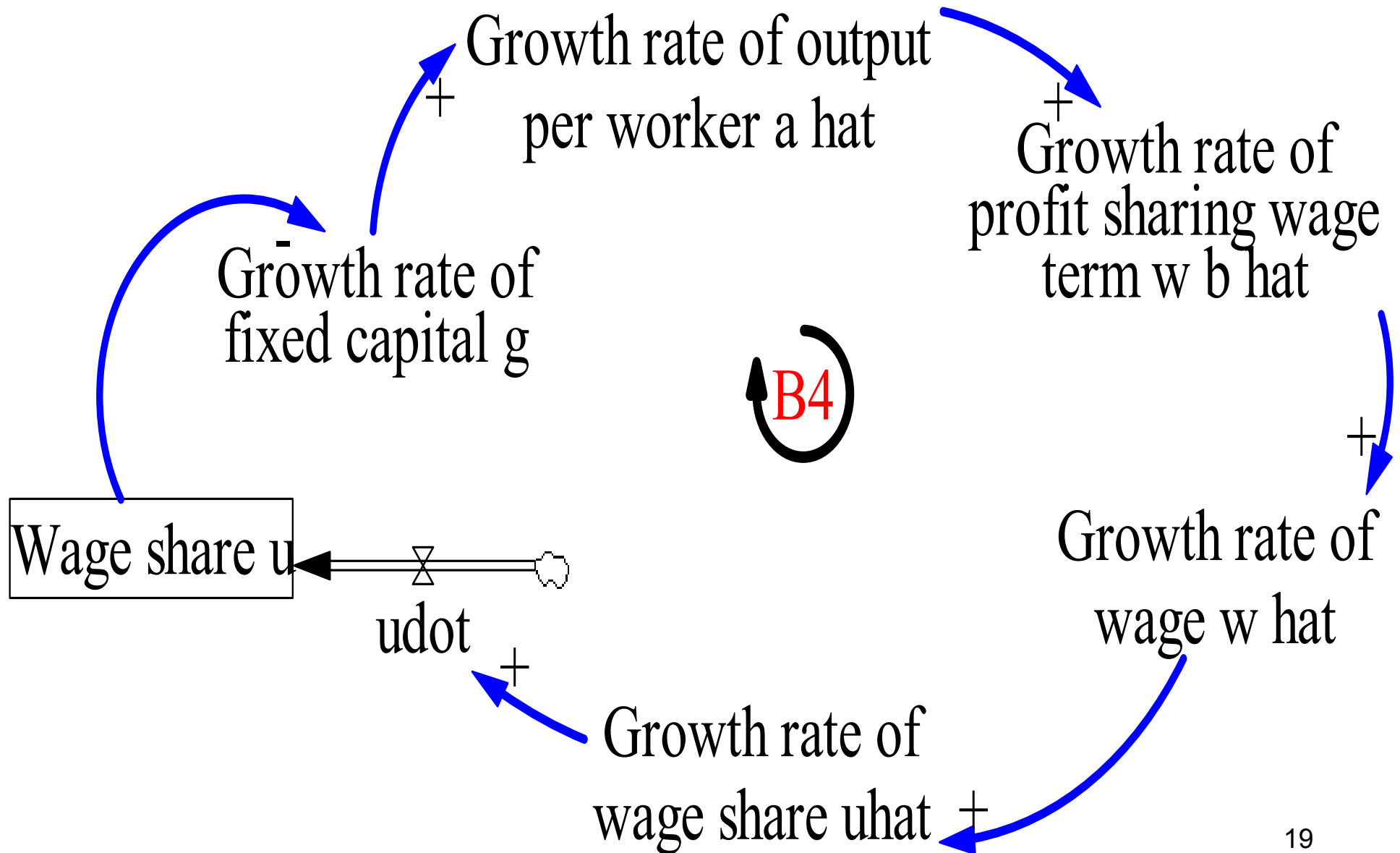
$$0\leq\delta\leq 10<<\delta_l, \quad -10\leq\pi\leq 0.$$

Parameters found

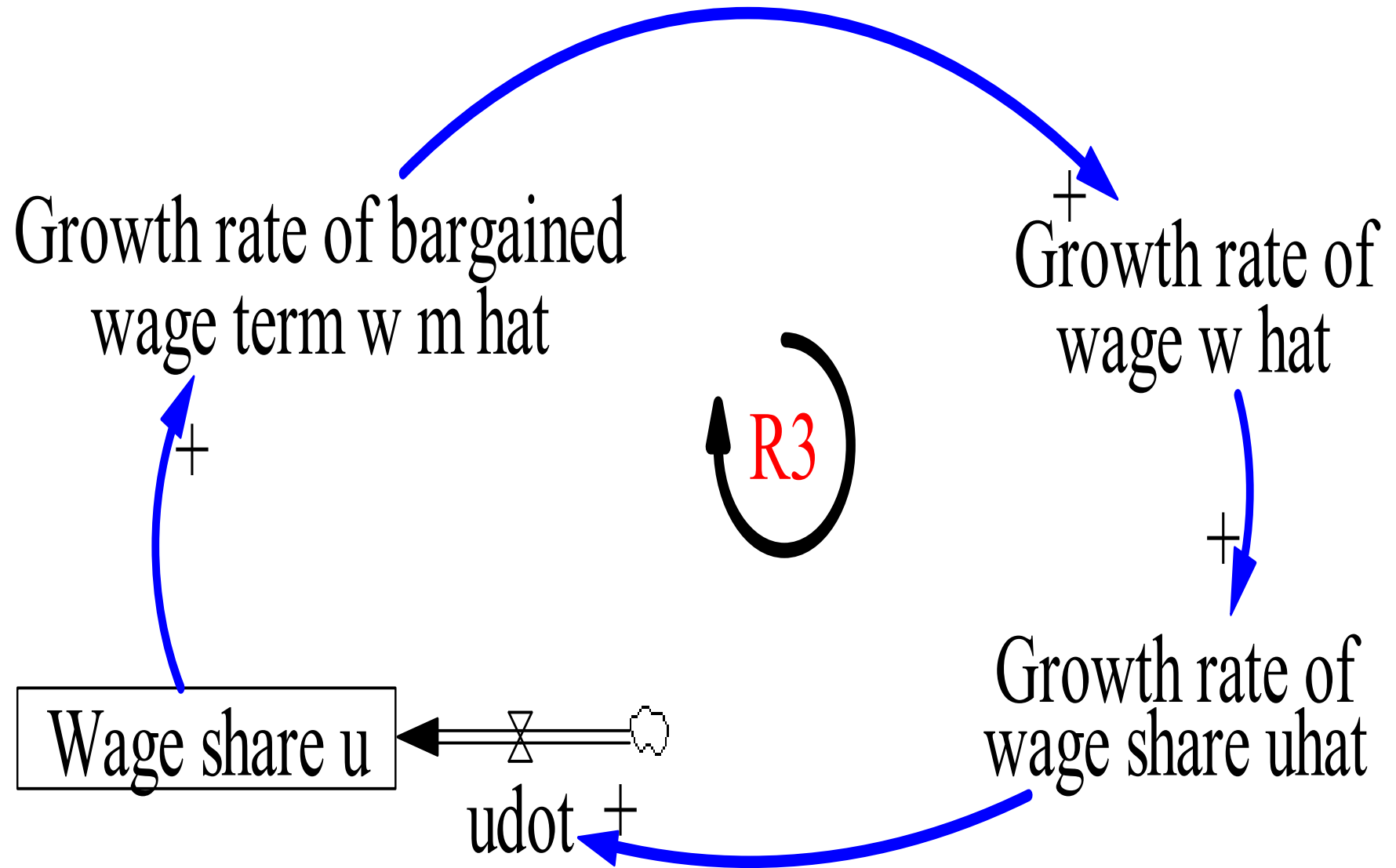$\pi = -0,534, \delta = 10, \pi_b = 7,253, v^* = X = 0,95,$

$T_c = 0,505.$

The causal structure of LGM-III

Target employment ratio X

Growth rate of bargained wage term w m hat

Employment ratio v

vdot

Growth rate of profit sharing wage term w b hat

Growth rate of employment ratio vhat

B1

B3

R3

Wage share u

udot

Growth rate of wage w hat

R2

Growth rate of fixed capital g

B2

Growth rate of wage share uhat

B4

Growth rate of output per worker a hat

R1

17

The additional 1ˢᵗ order negative loop in LGM-III

Growth rate of profit sharing wage term w b hat

$+$

Growth rate of fixed capital g

B3

$+$

Growth rate of wage w hat

$-$

$+$

Wage share u

udot $+$

Growth rate of wage share uhat

The next additional 1ˢᵗ order negative loop in LGM-III

Growth rate of output per worker a hat

Growth rate of profit sharing wage term w b hat

Growth rate of fixed capital g

+

−

+

B4

Wage share u

udot

+

Growth rate of wage w hat

Growth rate of wage share uhat

+

+

19

The additional 1st order positive loop in LGM-III

Growth rate of bargained
wage term w m hat

Growth rate of
wage w hat

+

R3

+

+

Wage share u

udot +

Growth rate of
wage share uhat

The main policy rule in LGM-III

Owners of capital, trade-unions and state officials agree on growth rate of profit depending on indicated (X_1) and current (v) employment ratios

$$\hat{M} = g - \frac{\ddot{u}}{1-u} = c_2(X_1 - v),$$

target employment ratio

$$X = X_1 - \frac{g^*}{c_2}, \; v < 1 < X_1; \; c_2 = \text{const} > 0.$$

Wage components growth rates in LGM-III

Bargained term $\hat{w}^m$	$c_2(v - X_1)\dfrac{1-u}{u} + c_1$
Profit sharing term $\hat{w}^b$	$\hat{a} + g\dfrac{1-u}{u} - c_1$
Each stationary	g*/2 for $u^* = 2/3$

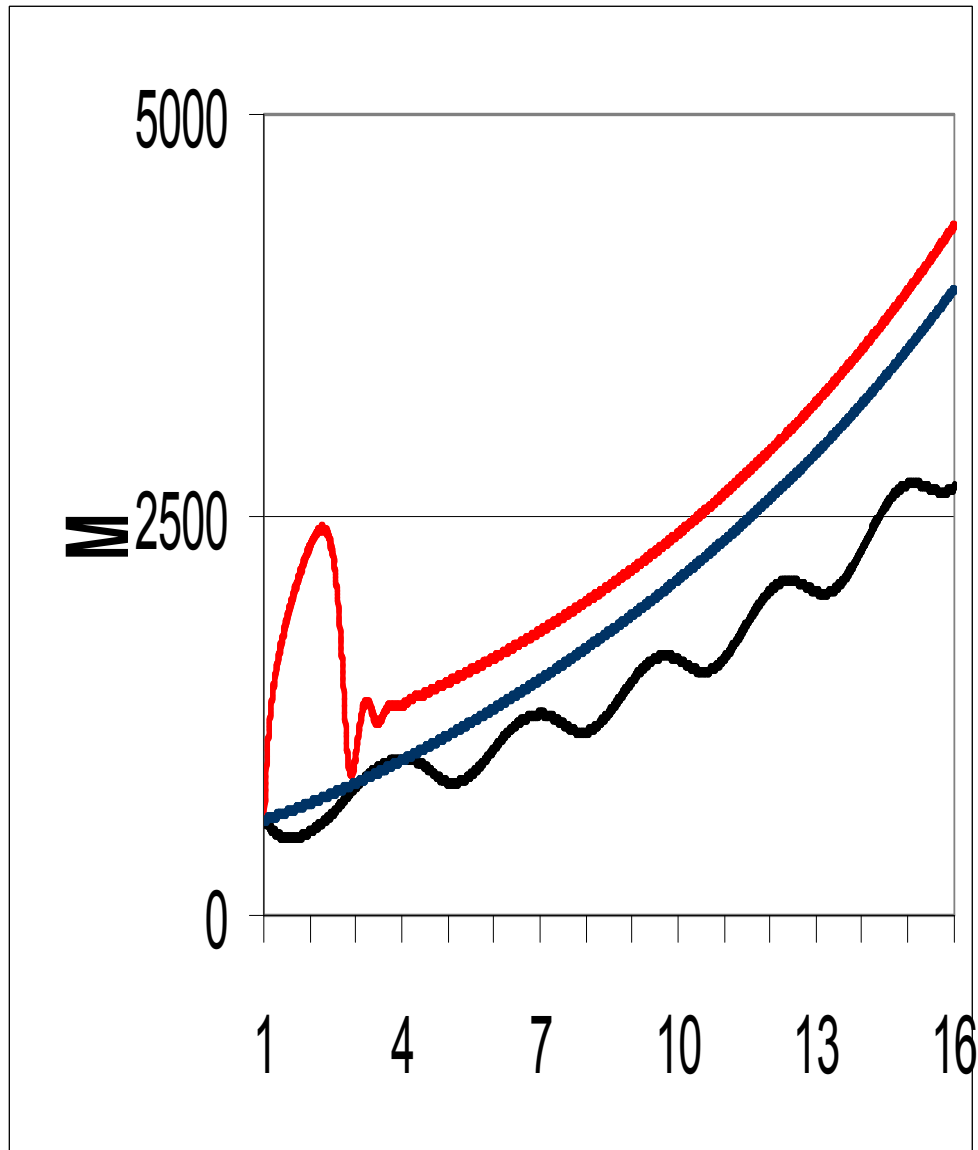# Output (P) and employment ratio (v) in scenarios I, II, III
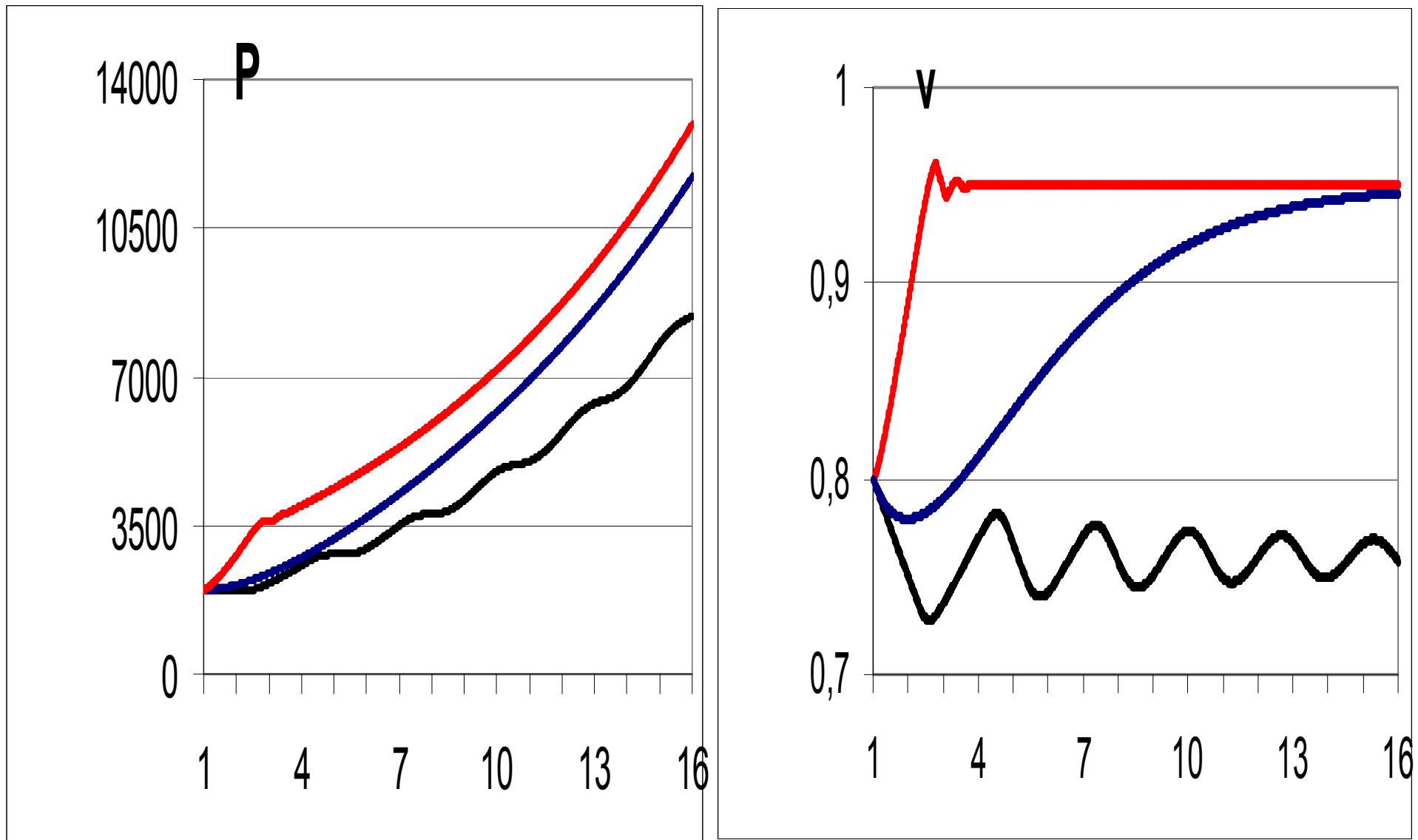
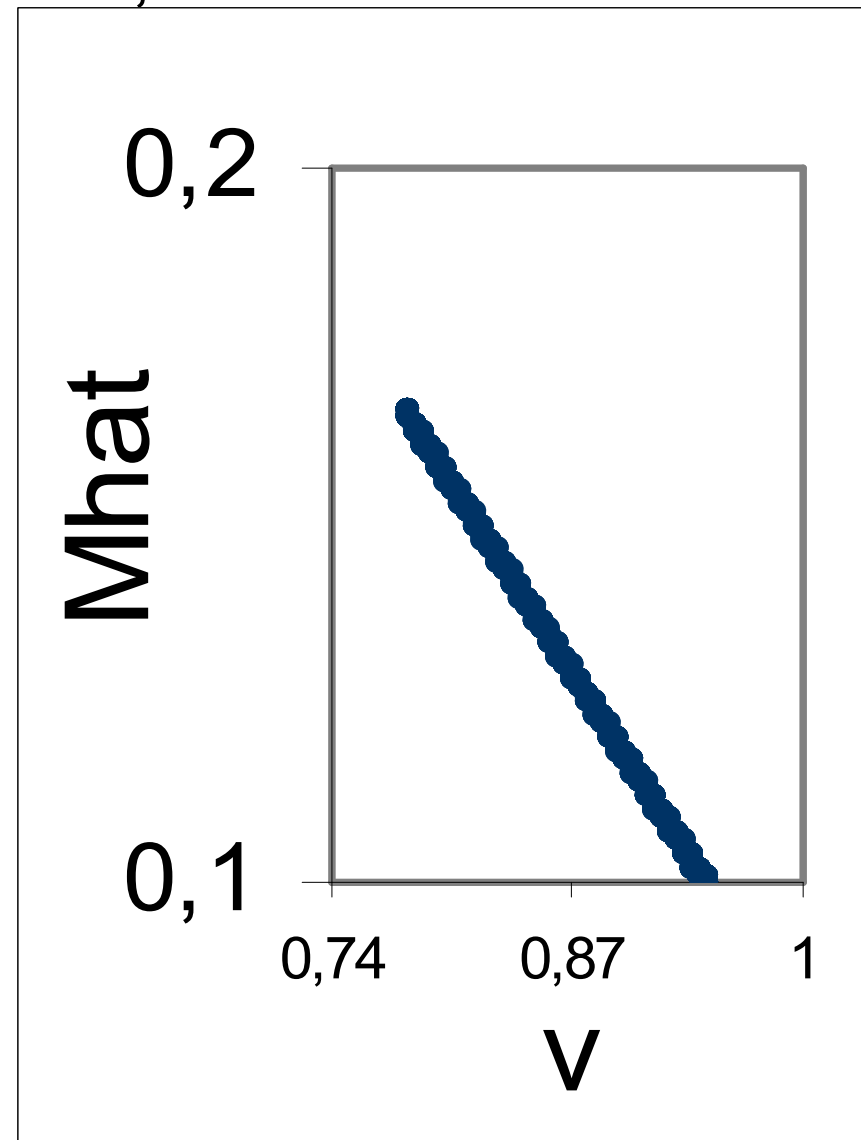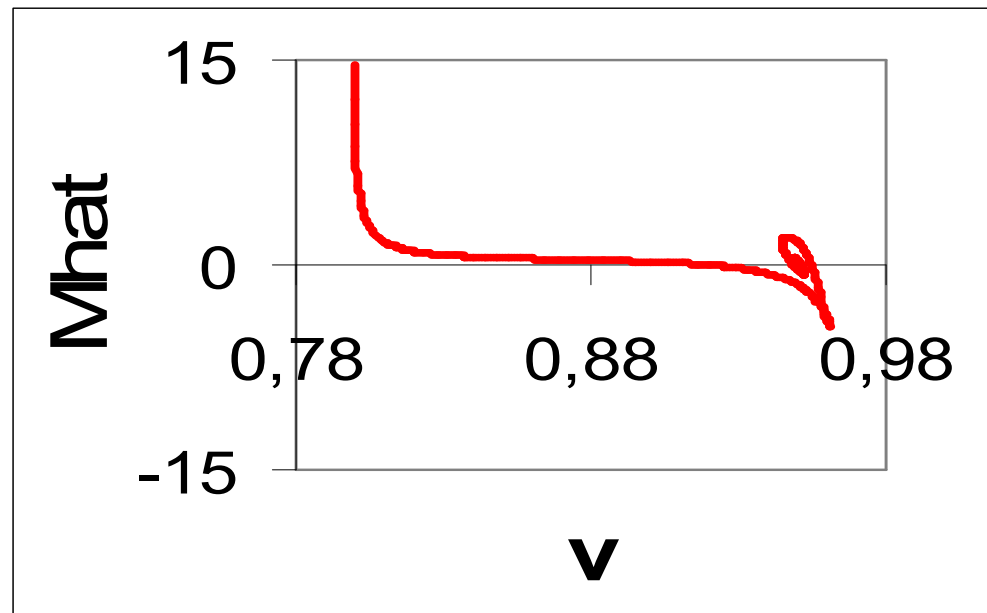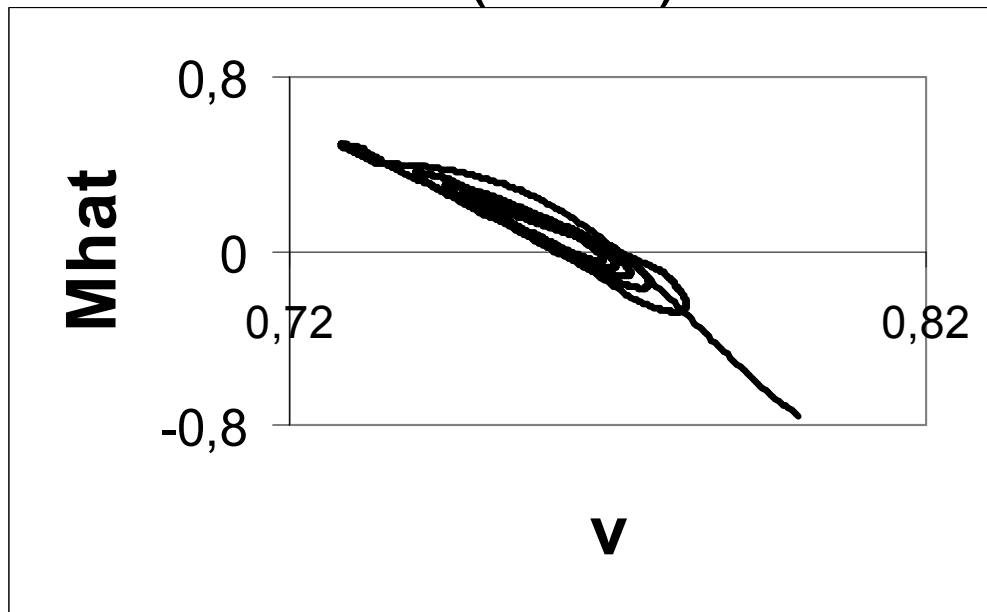# Profit rate and surplus value in scenarios I, II and III
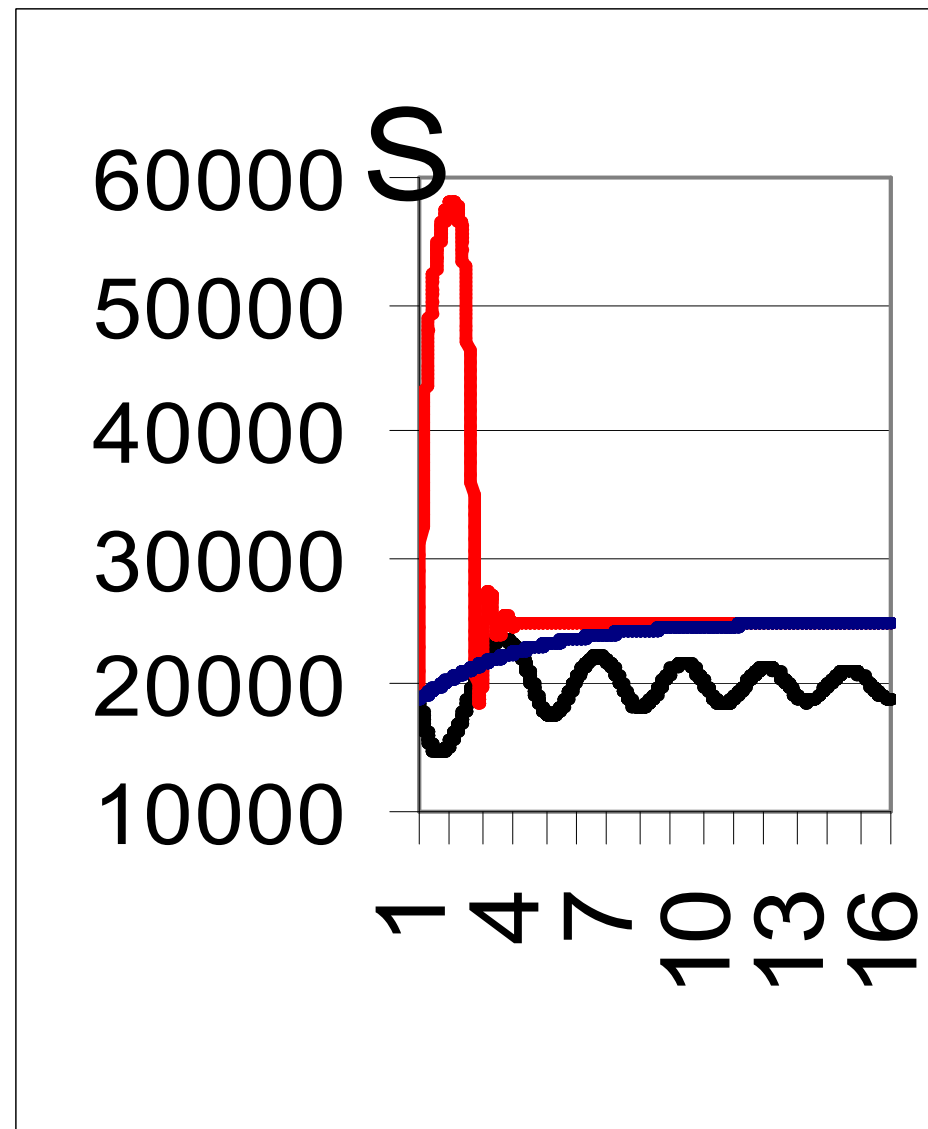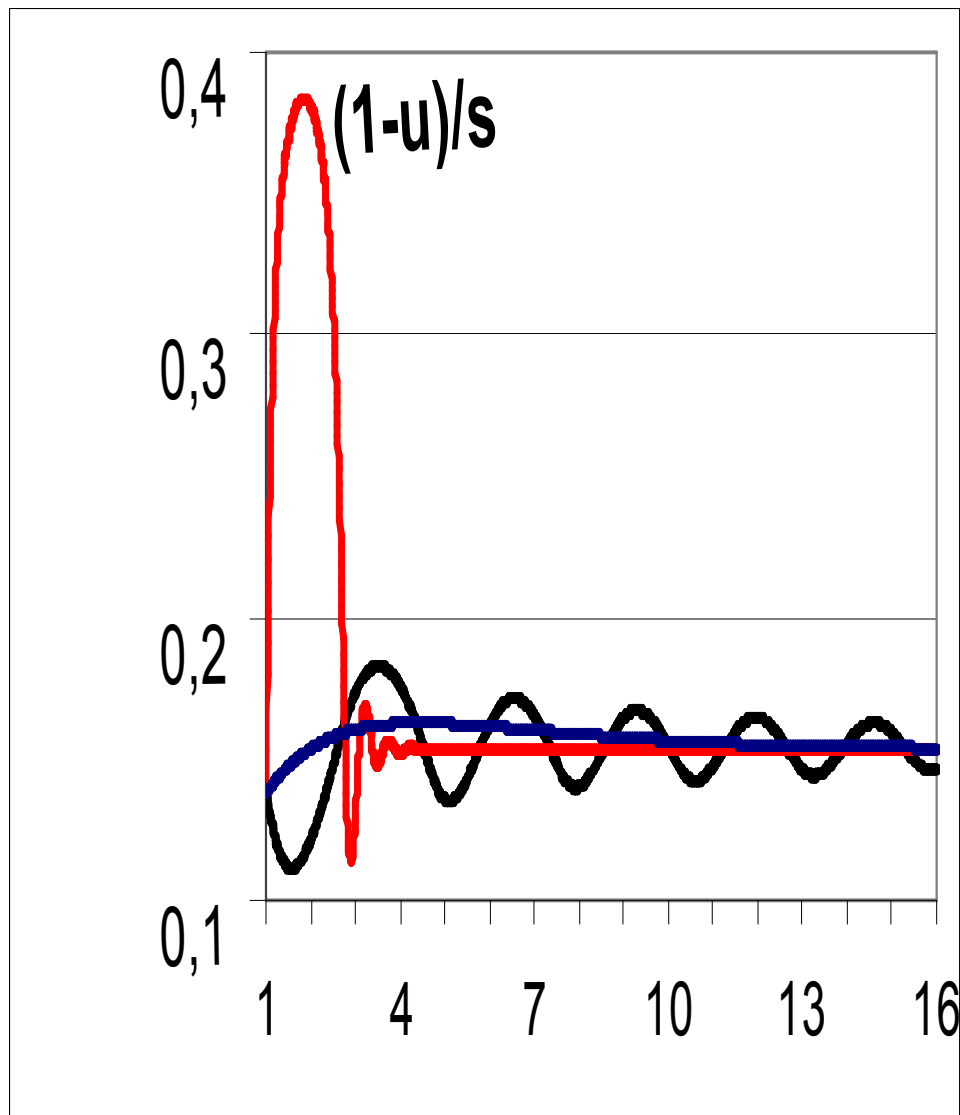
Rate of capital accumulation on transients to limit cycle in scenario I and to stationary state in scenarios II and III
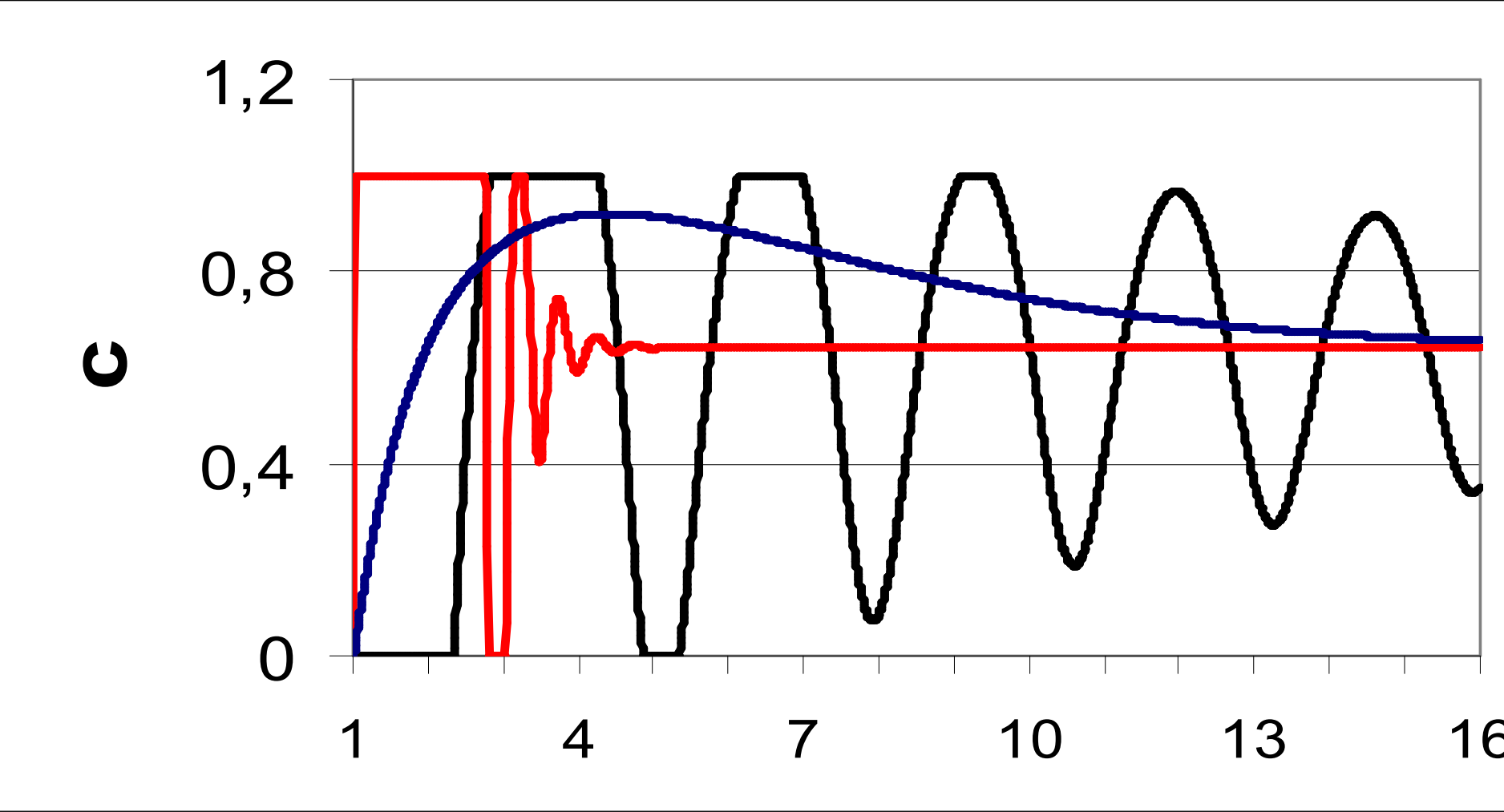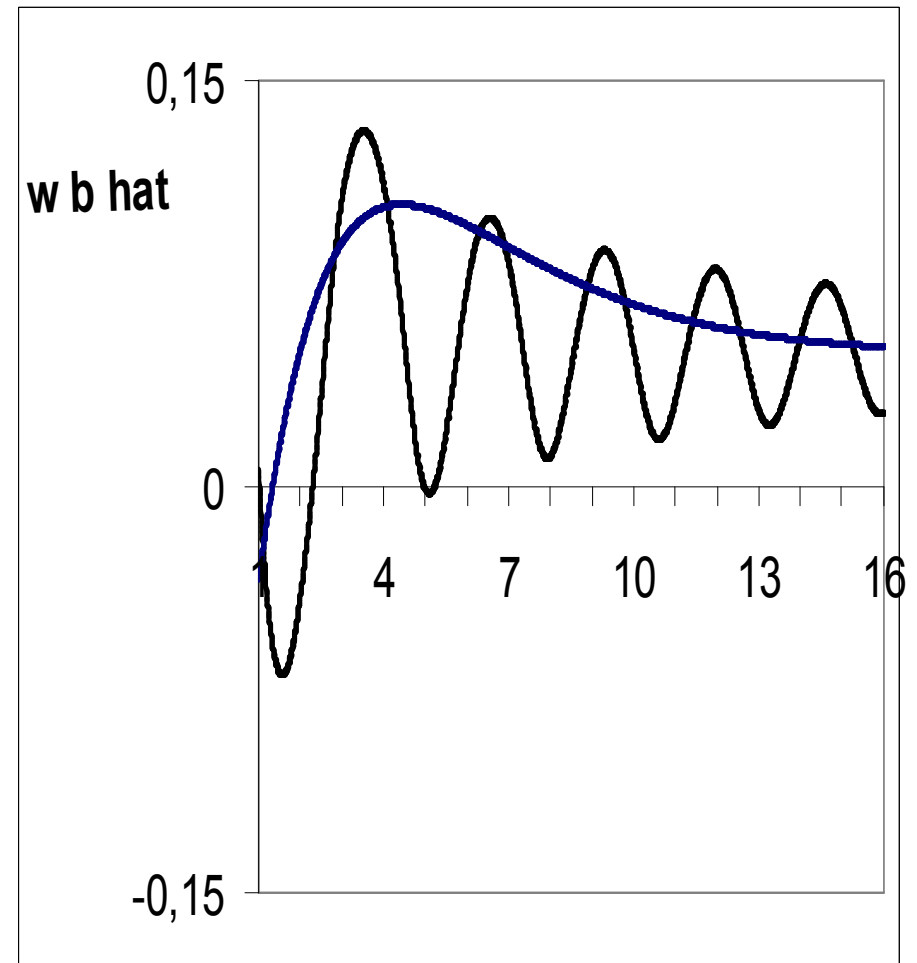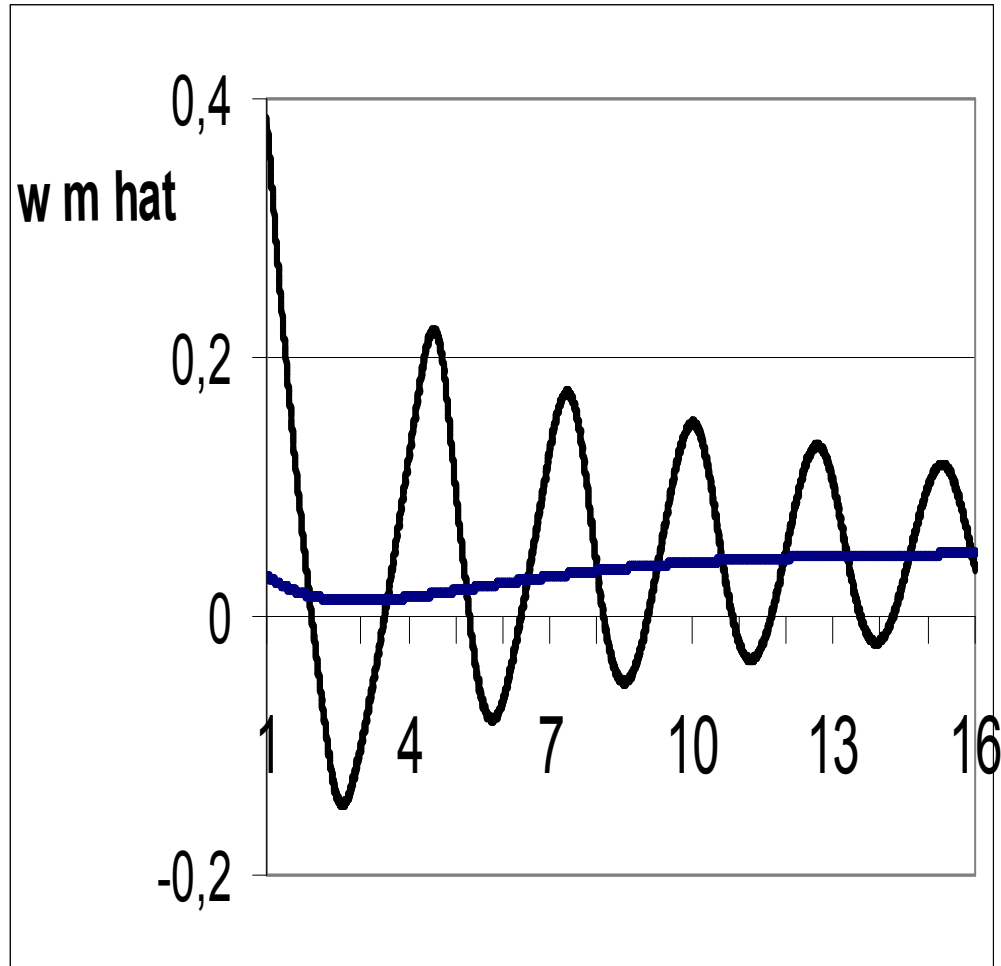
Total profit (M) and wage (w) in scenarios I, II and III
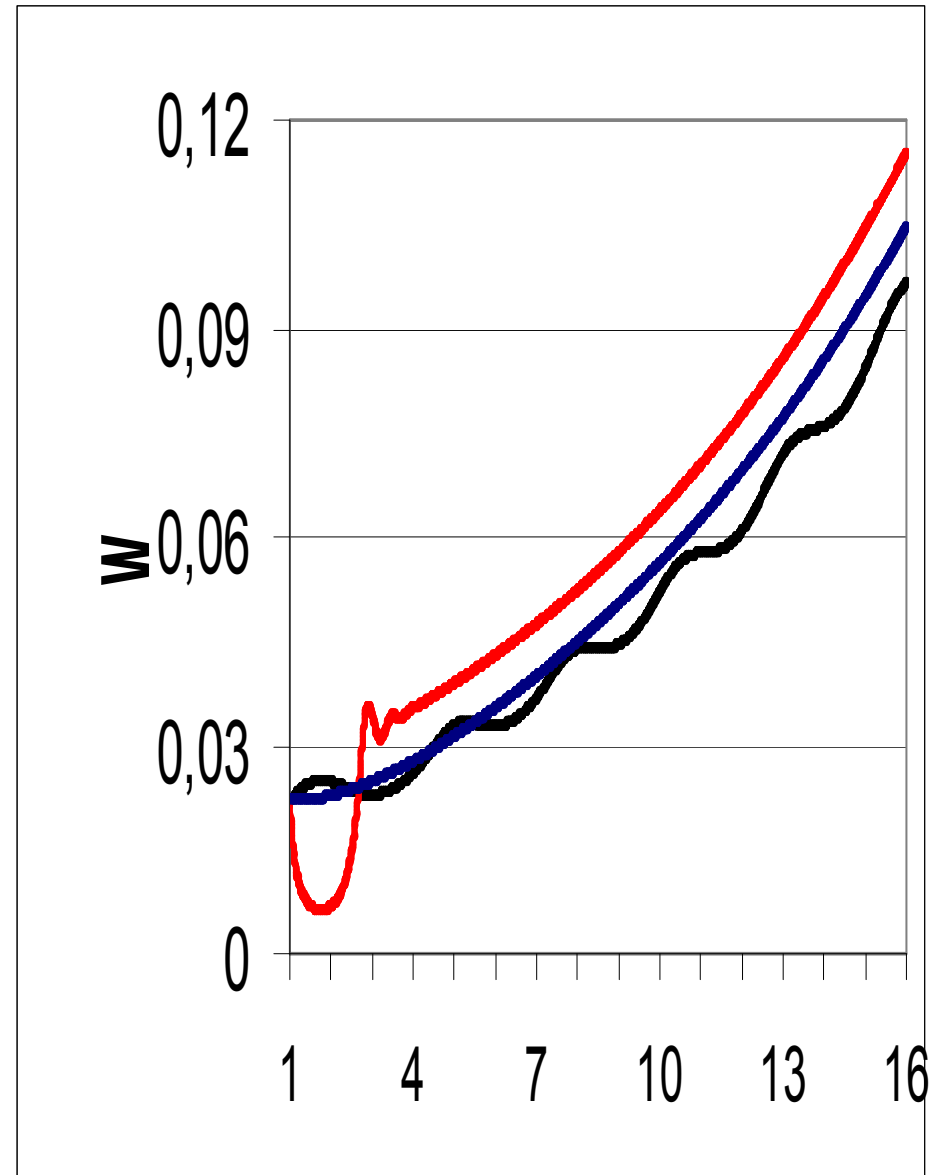
Employment ratio (v) and growth rate of profit (Mhat) in scenarios I, II and III

Bargained wage term (I.) and profit sharing term (r.) in scenarios I & III

Conclusion

LGM-I includes the embryonic stabilization policy without targeting employment.

LGM-I + low and high bounds   on rate of capital accumulation = LGM-II.

LGM-II illustrates pitfalls of policy optimization within deficient structure of capitalist reproduction.

LGM-II + targeting employment accurately = LGM-III. Profit sharing and bargained wage terms redesigned. Eradicated absolute over-accumulation of capital (I & II), relative over-accumulation is alleviated.

Extreme condition tests strengthen confidence in the invented policy rules against austerity trap!

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Ryzhenkov A. 2009. A Goodwinian model with direct and roundabout returns to scale … // *Metroeconomica* 60 (3).

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