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Money and Macroeconomics: A post-Keynesian/Kaleckian macroeconomic model for the classroom - the principle of effective demand, distribution conflict, inflation and macroeconomic policies in a monetary economy

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1. Introduction

2. The basic structure of the model

3. A model for a closed economy with constant prices

4. A model for a closed economy with conflict inflation

5. A post-Keynesian macroeconomic policy mix

6. Conclusions

1.
Introduction

Lecture will not be on

- Mainstream macro since the crisis
- ➢ Lavoie (2018) in RoKE
- Post-Keynesian macro since the mid/late 1990s
- ➢ Hein (2017) in EJEEP
- MMT and ELR
- ➢ Wray, et all vs. Palley: full of misunderstandings – pathological features?

Lecture will be on:

Full PKA to NCM, which remedies the flaws of mainstream macro that have led to the crisis, building on PK macro development over the last 20 year, and partially even including MMT (via Lerner‘s functional finance)..

Based on Hein/Stockhammer (2011), …

NCM (Goodfriend/King 1997, Clarida et al. 1999, Carlin/Sokice, 2009, 2015):

- long-run equilibrium (NAIRU) is determined by labour market institutions and social benefit system
- monetary policy applying the interest rate tool stabilises output and employment in the short run towards the NAIRU, and inflation in the long run towards target rate
- fiscal policy is downgraded
- financial sector is ignored – and now only introduced through including rigidities to be overcome …

PK critique (Arestis/Sawyer, Fontana, Hein, Kriesler, Lavoie, Palacio-Vera, Palley, Rochon, Setterfield, Smithin, Stockhammer, Wray, …):

- NAIRU is not exogenous to effective demand
- lack of a financial sector in NCM (only central bank …)
- limited capacity for stabilising monetary policy

➔ what about fiscal policy?

➔ PKs question NCM macroeconomic policy assignment (monetary, fiscal and wage policies)

“Full” PK alternative to NCM

- distribution conflict between rentiers, firms and workers;
- short-run inflation barrier;
- distribution conflict also affects income shares;
- income generation process includes real debt and interest cost effects;
- analysis of short-run stability;
- discussion of long-run endogeneity channels;
- complete PK macroeconomic policy-mix.

2.
The basic structure of the model

2.1 Production, finance, income and expenditures

- Closed economy with workers, firms/managers and rentiers, banks, a central bank … and also government expenditures at the end
- Firms use labour (N) and capital stock (K) as inputs, produce a homogeneous output (Y) with uniform mark-up price (p) on variable costs,
- No overhead labour (potential drawback?) , no depreciation of capital stock
- Fixed production coefficients, constant labour productivity (y)
- Economic activity is usually below potential output (Y^p) given by capital stock
- Unemployment (UE) as the rule
- Firms pay wages (W) to workers and interest on credit (R) to rentiers, retain part of the profits (Π_F)

- Workers only consume (C_W), and do not save
- Rentiers partly consume (C_R) and partly save (S_R) their income, in terms of further credit granted to firms or by holding money
- Investment (I) drives the system
- Capital stock finance draws on accumulated retained earnings (E_F) and credit by rentiers (B_R) and banks (B_B), which are owned by rentiers
- Exogenous interest rate (i), endogenous credit (B) and money (M) (‚horizontalist' view)
- Capital stock (K) and stocks of financial assets (B) are given in the short run

Table 2.1: Balance sheet matrix					
	Workers' households	Rentiers' households	Firms	Banks	Σ
Money		+M		-M	0
Loans		$+B_R$	$-(B_R+B_B)$	$+B_B$	0
Capital			pK		pK
Σ	0	$+B_R+M$	$+E_F$	0	pK $= B_R+M+E_F$ $= B_R+B_B+E_F$

Table 2.2: Transaction flow matrix						
	Workers' households	Rentiers' households	Firms' current	Firms' capital	Banks	Σ
Consumption	$-pC_W$	$-pC_R$	$+pC_W+pC_R$			0
Investment			+pI	-pI		0
Wages	+W		-W			0
Retained profits			$-\Pi_F$	$+dE_F$		0
Distributed profits: interest		+R	-R			0
Change in loans		$-dB_R$		$+dB_R+dB_B$	$-dB_B$	0
Change in Money		-dM			+dM	0
Σ	0	0	0	0	0	0

C_W: consumption out of wages, C_R: consumption out of rentiers' income, I: investment, W: wages, Π_F: retained profits, dE_F: change in accumulated retained earnings, R: rentiers' income, dB_R: change in stock of credit granted by rentiers, dB_B: change in stock of credit granted by banks, dM: change in the stock of money

(2.1) $$pK = E_F + B_R + B_B .$$

(2.2) $$pY = pC_W + pC_R + pI .$$

(2.3) $$pY = W + \Pi = W + \Pi_F + R = W + \Pi_F + i\left(B_R + B_B\right).$$

(2.4) $$W = pC_W ,$$

(2.5) $$R = pC_R + S_R = pC_R + dB_R + dM$$

(2.6) $$pI = dE_F + dB_R + dB_B ,$$

2.2 Endogenous money and exogenous interest rates

Table 2.3: Balance sheet matrix with a central bank						
	Workers' households	Rentiers' households	Firms	Commercial banks	Central bank	Σ
Money/ Reserves		$+M_R$		$+M_B$	-M	0
Deposits		$+D_R$		-D		0
Loans		$+B_R$	$-(B_R+B_B)$	$+bB_B$	$+(1-b)B_B$	0
Capital			pK			pK
Σ	0	$+B_R+D_R+M_R$	$+E_F$	0	0	pK = $E_F+B_R+B_B$ = $E_F+B_R+D_R+M_R$

The consistency of the balance sheet matrix requires:

(2.7) $$pK = E_F + B_R + B_B = E_F + B_R + D_R + M_R \, .$$

➔ PK 'horizontalist' monetary view pioneered by Kaldor (1982), Lavoie (1992, 1996b), Moore (1989)

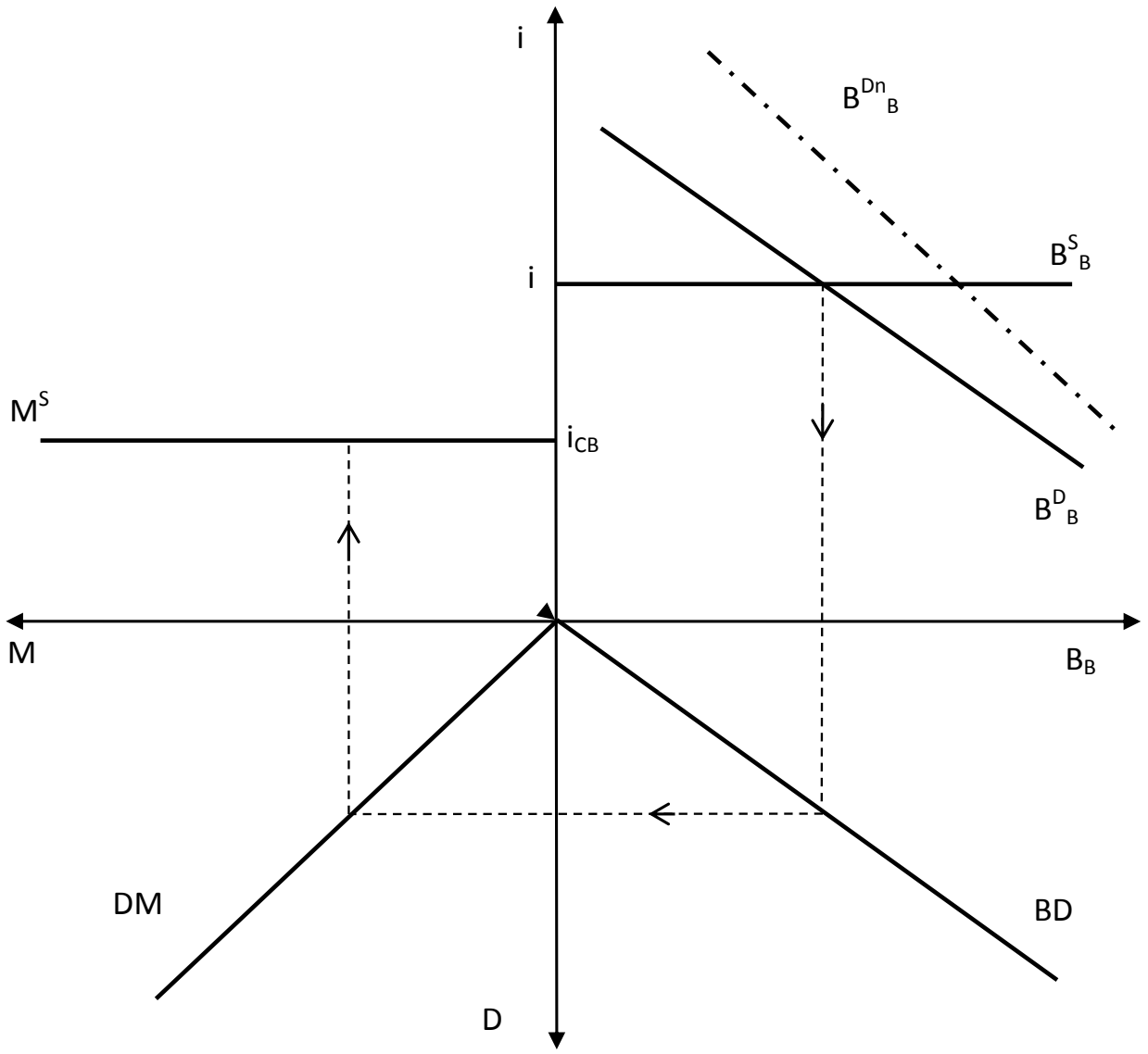
'Money is credit-driven; loans make deposits; deposits make reserves. The supply of and the demand for credit money are interdependent. The control instrument of the central bank is not a quantity but a price, the rate of interest.'
(Lavoie, 1992, p. 170)

- Commercial banks mark-up central bank base rate (liquidity preference, risk assessment, costs of default, other costs of banking competition, …) and lend to creditworthy borrowers

(2.8) $$i = (1 + m_B)\, i_{CB}\,.$$

- Credit rationing because of asymmetric expectations (Wolfson 1996)

Figure 2.1: The horizontalist approach of endogenous money and credit



i_{CB}: central bank rate of interest in money market

i: commercial bank rate of interest in credit market

B^S_B: credit supply by banks

B^D_B: creditworthy credit demand

B^{Dn}_B: notional credit demand

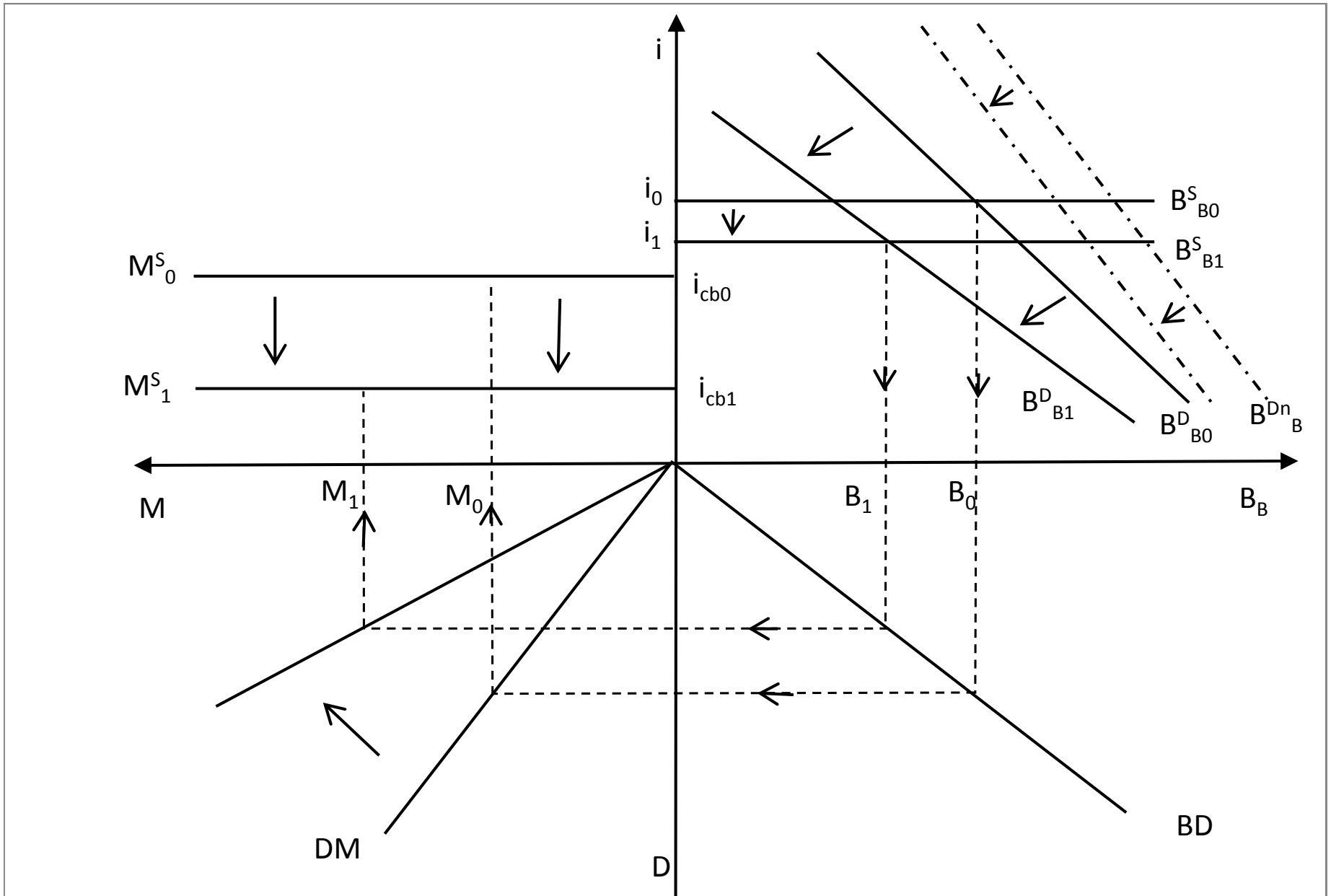
BD: loand-deposit curve

D: deposits

DM: deposit-reserves curve

M^S: supply of reserves

Figure 2.2: Interest rates, credit and money during the financial and economic crisis 2007-09



- Central bank controls the short-term money market rate of interest
- Central bank policies affect the long-term credit market rate of interest,
  ➔ potential asymmetry: interest rate can be increased in any case, but not decreased if commercial banks increase their mark-ups (increase in liquidity preference, perceived risk of credit default, …)
- Volume of credit and quantity of money are endogenously determined by economic acitivity, credit demand and payment conventions
- Changes in the long-term rate of interest may affect credit demand and hence the volumes of credit and money, if credit demand is interest elastic
  ➔ potential asymmetry: increasing the rate of interest will finally choke credit demand and economic activity, decreasing the rate of interest may not be sufficient to stimulate credit demand and economic activity (investment trap), furthermore: zero lower bound for nominal rate of interest.

3.

A model for a closed economy with constant prices

3.1. The basic model

Prices (p) are determined by mark-up (m) pricing on constant unit direct labour costs (w/y).

(3.1) $$p = [1 + m(i)]\frac{w}{y}, \qquad m \geq 0, \frac{\partial m}{\partial i} \geq 0 .$$

w: nominal wage rate y: labour productivity, i: interest rate

The mark-up determines the share of gross profits (Π) in national income (h), and thus also the share of wages (W) in national income ($1-h=\Omega$):

(3.2) $$h = \frac{\Pi}{pY} = \frac{\Pi}{W+\Pi} = \frac{m(i)W}{W+m(i)W} = \frac{m(i)}{1+m(i)},$$

(3.3) $$\Omega = 1-h = \frac{W}{pY} = \frac{W}{W+\Pi} = \frac{W}{W+m(i)W} = \frac{1}{1+m(i)} .$$

Saving (S) as sum of retained earnings and saving out of rentiers' income:

(3.4) $$S = \Pi - R + S_R = hpY - \left(1 - s_R\right) iB, \qquad 1 \geq s_R > 0 .$$

Π: profits (retained earnings and interest), R: interest, S_R: Saving out of interest income, s_R: propensity to save out of interest income, B: volume of credit

Investment is determined by expectations („animal spirits", Keynes) resp. autonomous investment, demand for goods and interest payments („principle of increasing risk", Kalecki)

(3.5) $$pI = pI_a + \beta pY - \theta iB, \quad I_a, \beta, \theta \geq 0 .$$

Goods market equilibrium:

(3.6) $$\mathrm{pI} = \mathrm{S},$$

Stability conditions:

(3.7) $$\frac{\partial \mathrm{S}}{\partial(\mathrm{pY})} > \frac{\partial(\mathrm{pI})}{\partial(\mathrm{pY})} \Rightarrow \mathrm{h} - \beta > 0\,.$$

3.2 The goods market equilibrium and the effects of changes in model parameters

Plugging equation (3.4) and (3.5) into equation (3.6), the goods market equilibrium value for income can be derived:

$$(3.8) \qquad pY^* = \frac{pI_a + (1 - s_R - \theta) iB}{h - \beta},$$

And using the equilibrium value for income from equation (3.8) in equation (3.4) or (3.5), we can then calculate the respective equilibrium values for investment and saving:

$$(3.9) \qquad pI^* = S^* = \frac{pI_a h + [\beta(1 - s_R) - \theta h] iB}{h - \beta},$$

By using the definition of the profit share ($h = \Pi / pY$) we can derive from equation (8) also the equilibrium value of profits:

$$(3.10) \quad \Pi^* = \frac{h[pI_a + (1 - s_R - \theta) iB]}{h - \beta},$$

Figure 3.1: Short-run equilibrium income and investment/saving

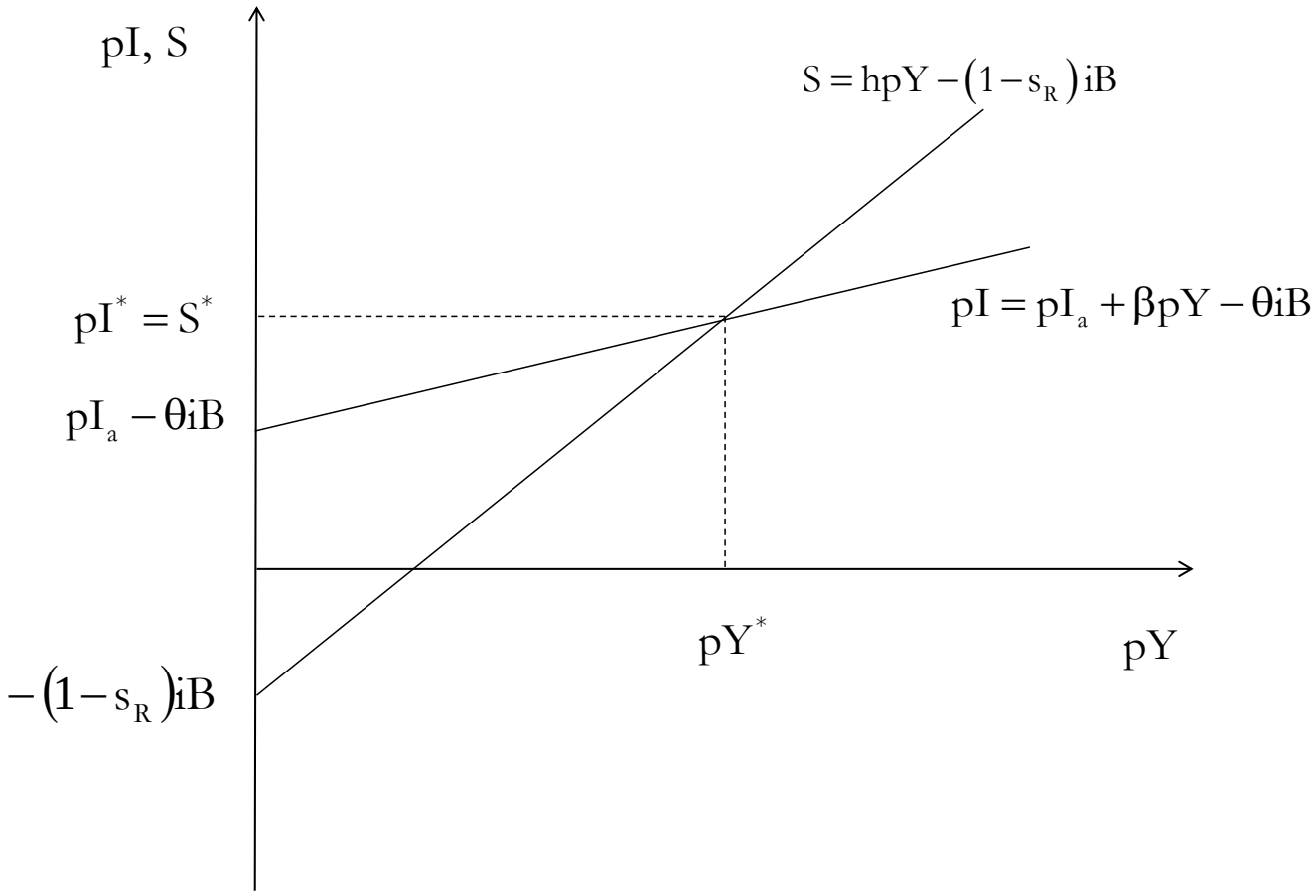


Figure 3.2: An increase in animal spirits

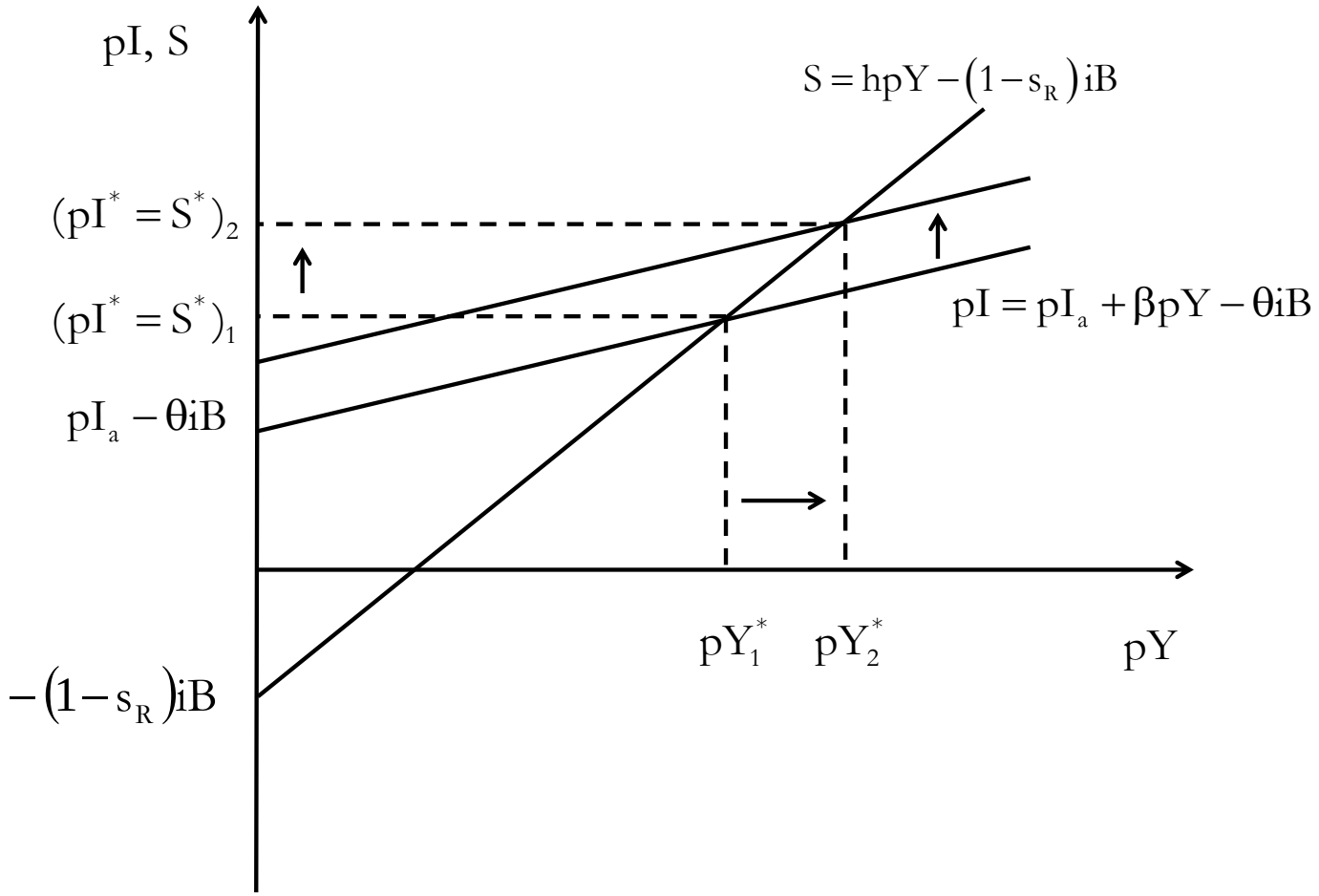
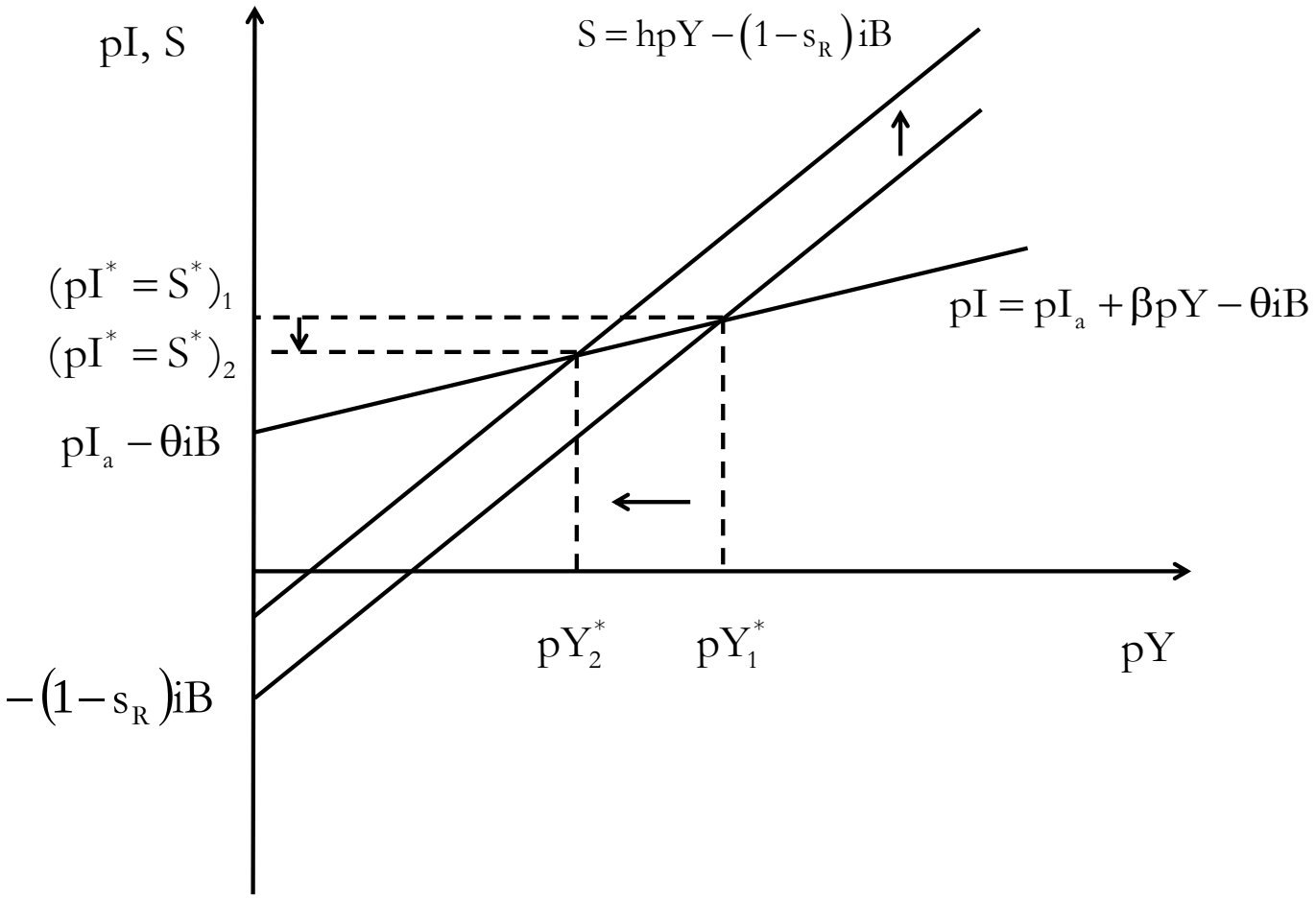
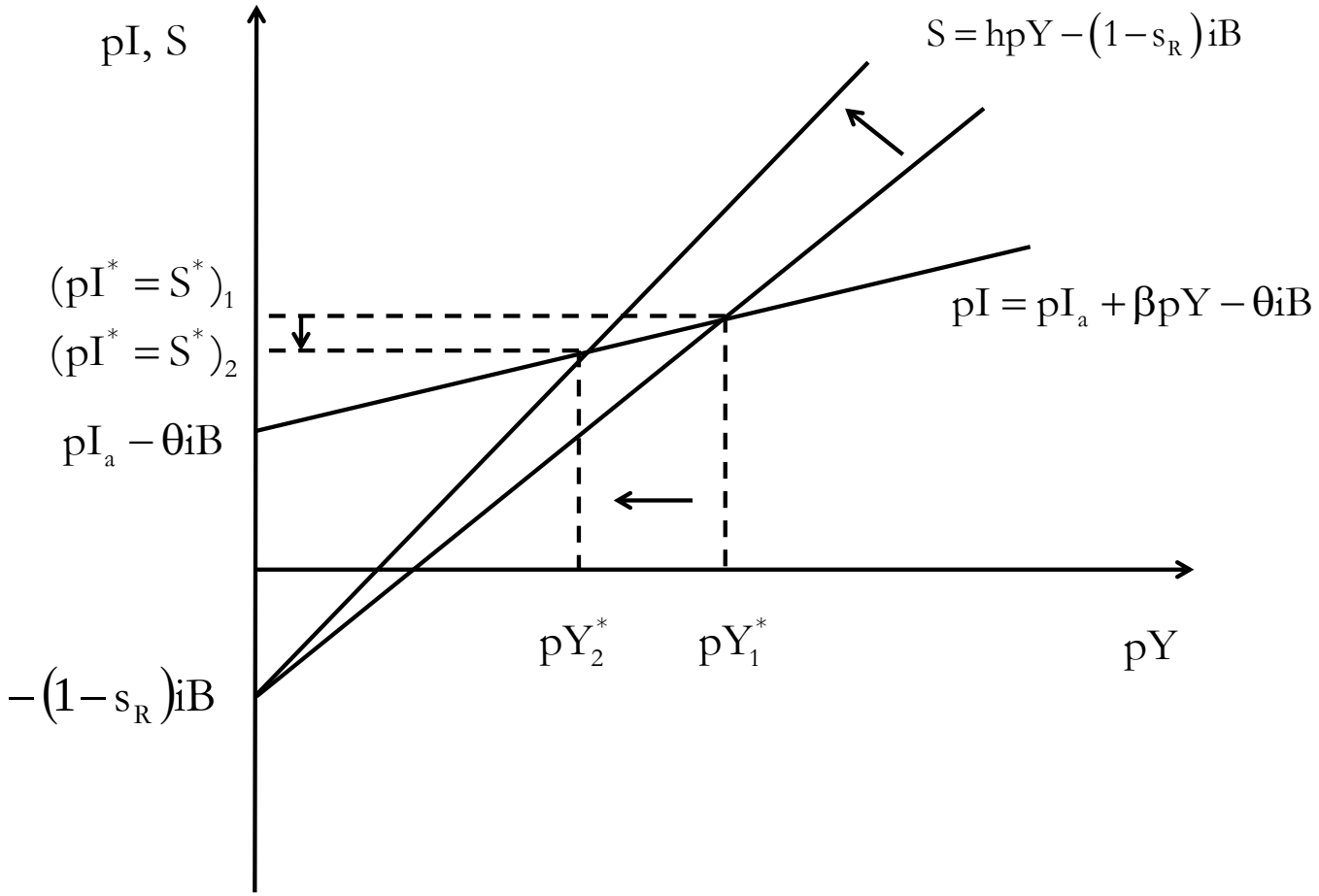


Figure 3.3: An increase in the rentiers' propensity to save



➔ Paradox of thrift

Figure 3.4: An increase in the profit share



➔ wage-led aggregate demand

A rise in the profit share

(3.8a) $$\frac{\partial\left(pY^{*}\right)}{\partial h}=\frac{-\left[pI_{a}+\left(1-s_{R}-\theta\right)iB\right]}{\left(h-\beta\right)^{2}}=\frac{-pY^{*}}{h-\beta}<0\,,$$

(3.9a) $$\frac{\partial\left(pI^{*}\right)}{\partial h}=\frac{-\beta\left[pI_{a}+\left(1-s_{R}-\theta\right)iB\right]}{\left(h-\beta\right)^{2}}=\frac{-\beta pY^{*}}{h-\beta}<0\,,$$

(3.10a) $$\frac{\partial\Pi^{*}}{\partial h}=\frac{-\beta\left[pI_{a}+\left(1-s_{R}-\theta\right)iB\right]}{\left(h-\beta\right)^{2}}=\frac{-\beta pY^{*}}{h-\beta}<0\,.$$

➔ wage-led aggregate demand + paradox of costs

A change in the interest rate

(3.8b) $$\frac{\partial\left(pY^{*}\right)}{\partial i}=\frac{\left(1-s_{R}-\theta\right)B-pY^{*}\dfrac{\partial h}{\partial i}}{h-\beta},$$

(3.9b) $$\frac{\partial\left(pI^{*}\right)}{\partial i}=\frac{\left[\beta\left(1-s_{R}\right)-\theta h\right]B-\beta pY^{*}\dfrac{\partial h}{\partial i}}{h-\beta},$$

(3.10b) $$\frac{\partial\Pi^{*}}{\partial i}=\frac{\left(1-s_{R}-\theta\right)hB-\beta pY^{*}\dfrac{\partial h}{\partial i}}{h-\beta}.$$

Figure 3.5: A rise in the interest rate with an interest-inelastic profit share I: the normal case – fall in equilibrium income and investment/saving

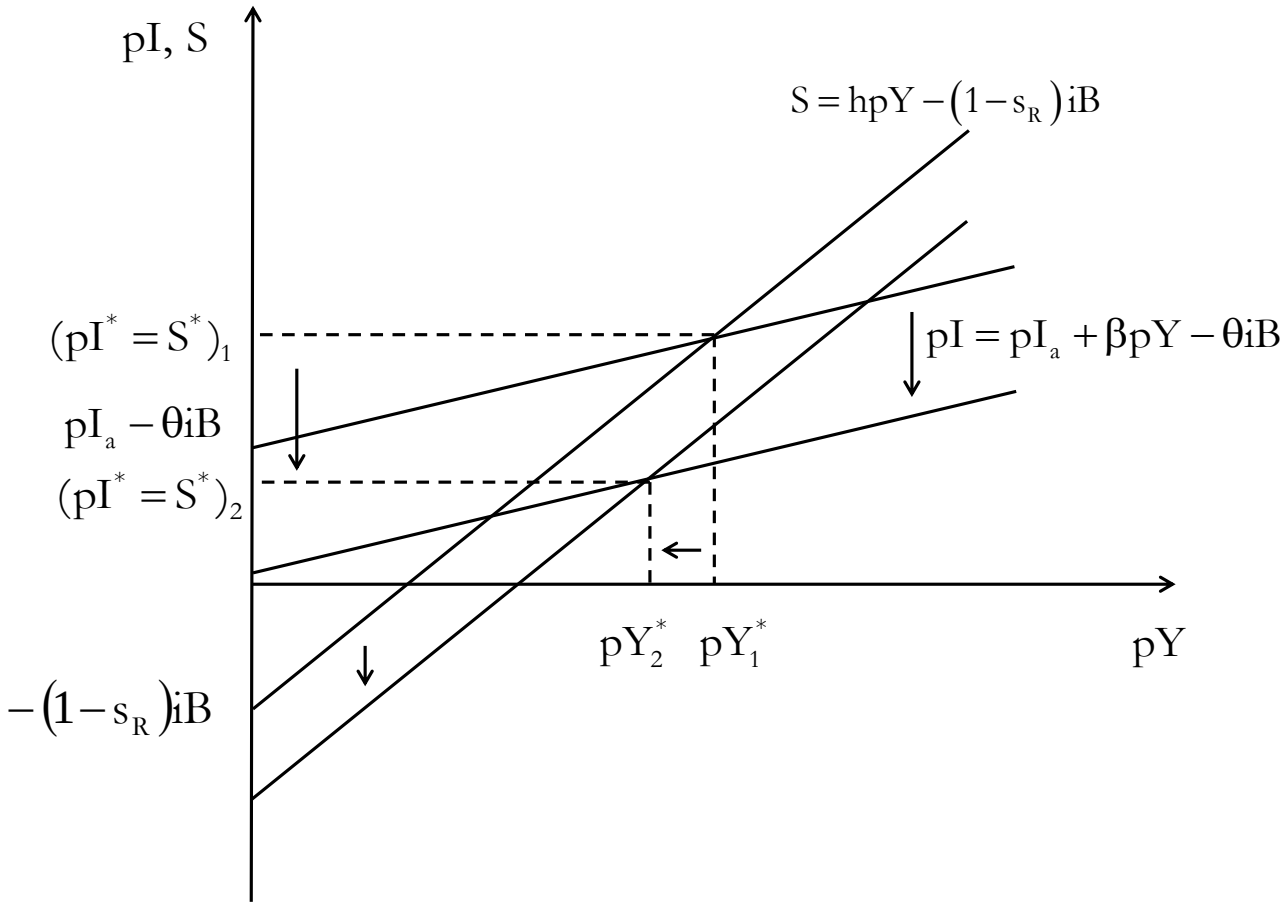


Figure 3.6: A rise in the interest rate with an interest-inelastic profit share II: the intermediate case – rise in equilibrium income but fall in investment/saving

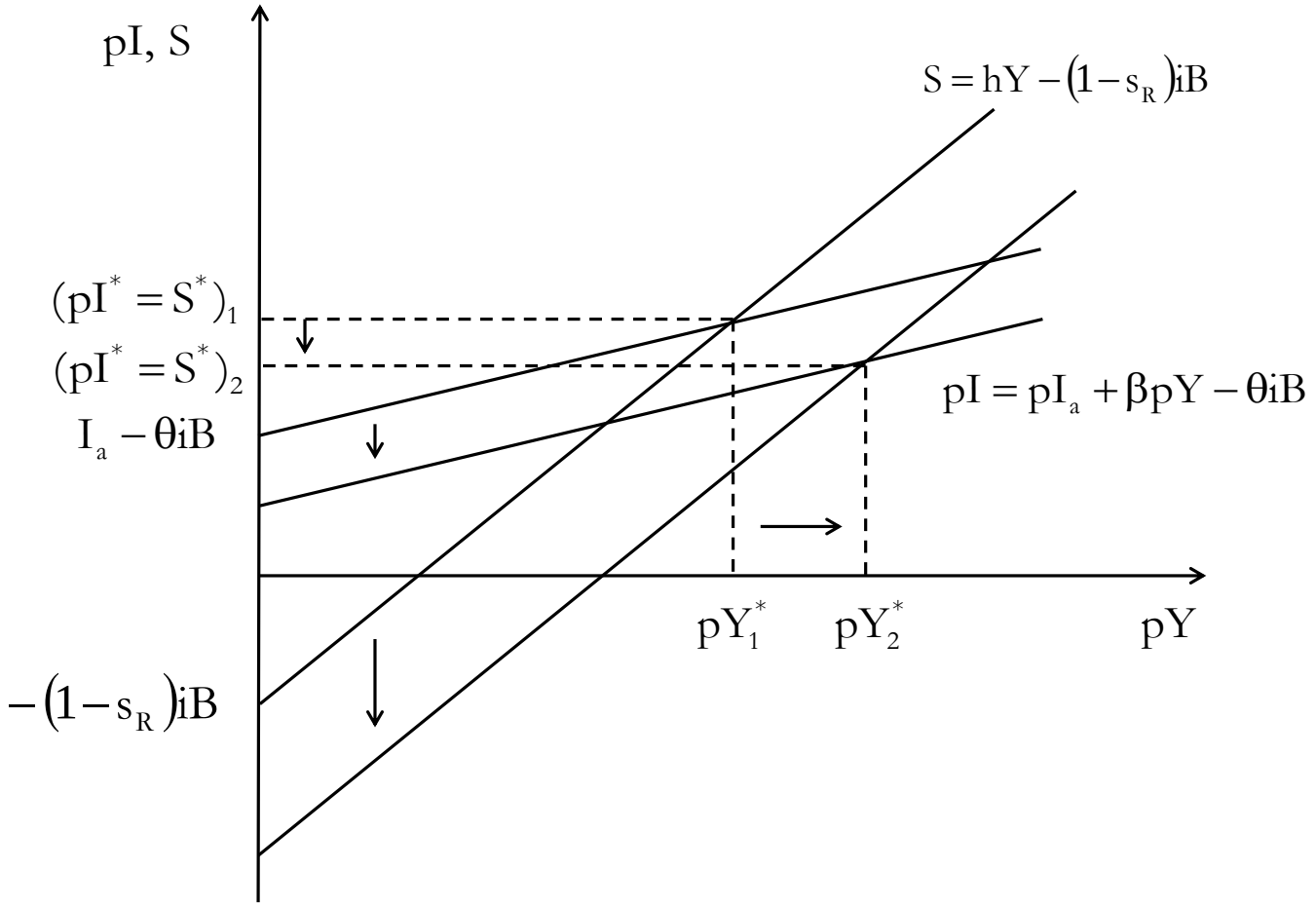


Figure 3.7: A rise in the interest rate with an interest-inelastic profit share III: the puzzling case – rise in equilibrium income and investment/saving

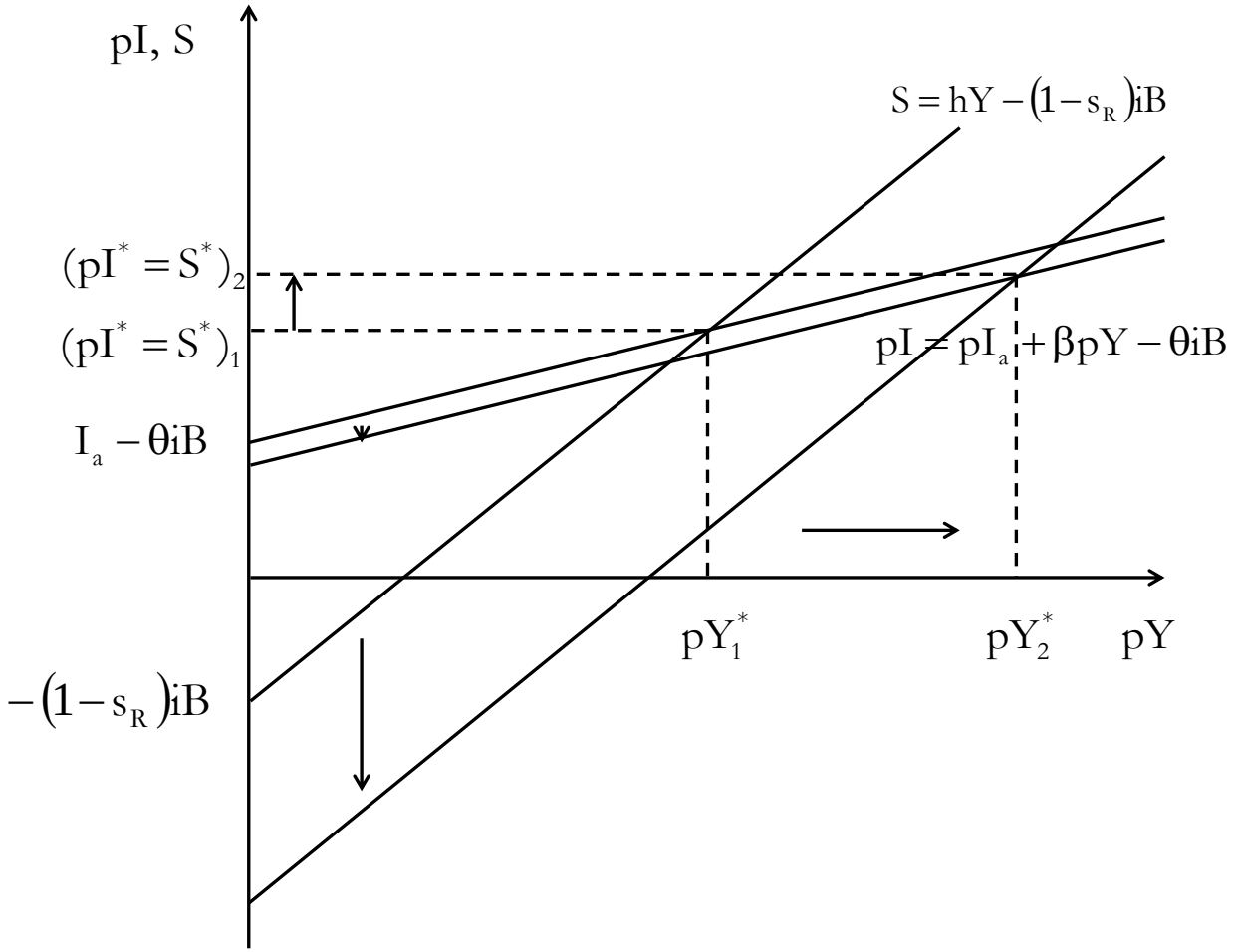


Table 3.1: Responses of equilibrium output/income (pY*), investment/saving (pI*=S*) and profits (Π*) towards changes in exogenous variables and parameters			
	pY*	pI*=S*	Π*
pI_a	+	+	+
s_R	–	–	–
h	–	–	–
i	+/–	+/–	+/–

4.

A model for a closed economy with conflict inflation

- PK: Inflation is conflict inflation
- Joan Robinson (1956, 1962): inflation barrier
- Kalecki (1971): increase in money wages may squeeze mark-up
- Rowthorn (1977, p. 177): “The working class can shift distribution in its favour by fighting more vigorously for higher wages, although the cost of such militancy is a faster rate of inflation, as capitalists try, with only partial success to protect themselves by raising prices.”
- Sylos-Labini (1979): Differentials in unit labour costs are precondition for nominal wage hikes squeezing average mark-up

➔ Distribution conflict, inflation and re-distribution

4.1 Conflicting claims, employment, unexpected inflation and distribution between labour and capital

(4.1) $h_F^T = h_F^T(m) = h_0, \qquad 0 < h_0 \leq 1$.

➔ target gross profit share of firms

(4.2) $(1-h)_W^T = \Omega_W^T = \Omega_0 + \Omega_1 e, \qquad 0 < \Omega_0 \leq 1, \qquad 0 \leq \Omega_1$.

➔ target wage share of workers, e: rate of employment

Income claims will be consistent if:

(4.3) $(1-h)_W^T + h_F^T = 1 \Leftrightarrow h_W^T = h_F^T \Leftrightarrow (1-h)_W^T = (1-h)_F^T$.

or, if:

(4.4) $h_0 + \Omega_0 + \Omega_1 e^N = 1$.

From equation (4.4) a 'consistent claims rate of employment' or a 'stable inflation rate of employment', a SIRE (e^N), determining the 'non-accelerating inflation rate of unemployment', the NAIRU ($u^N = 1 - e^N$) can be derived:

(4.5) $$e^N = \frac{1 - \Omega_0 - h_0}{\Omega_1}.$$

With a deviation of employment from e^N equation (4.4) turns to:

(4.6) $$h_0 - h_2\hat{p}^u + \Omega_0 + \Omega_1 e - \Omega_2\hat{p}^u = 1,\ 0 < h_0, \Omega_0 < 1,\ 0 \le h_2, \Omega_1, \Omega_2 .$$

(4.7) $$e^N = e - \frac{(\Omega_2 + h_2)\hat{p}^u}{\Omega_1}$$

Realised profit share:

(4.8) $$h = h_0 - h_2\hat{p}^u, \qquad 0 < h_0 < 1, 0 \le h_2,$$

Realised wage share

(4.9) $$(1 - h) = \Omega = \Omega_0 + \Omega_1 e - \Omega_2\hat{p}^u, \qquad 0 < \Omega_0 < 1, \qquad 0 \le \Omega_1, \Omega_2 .$$

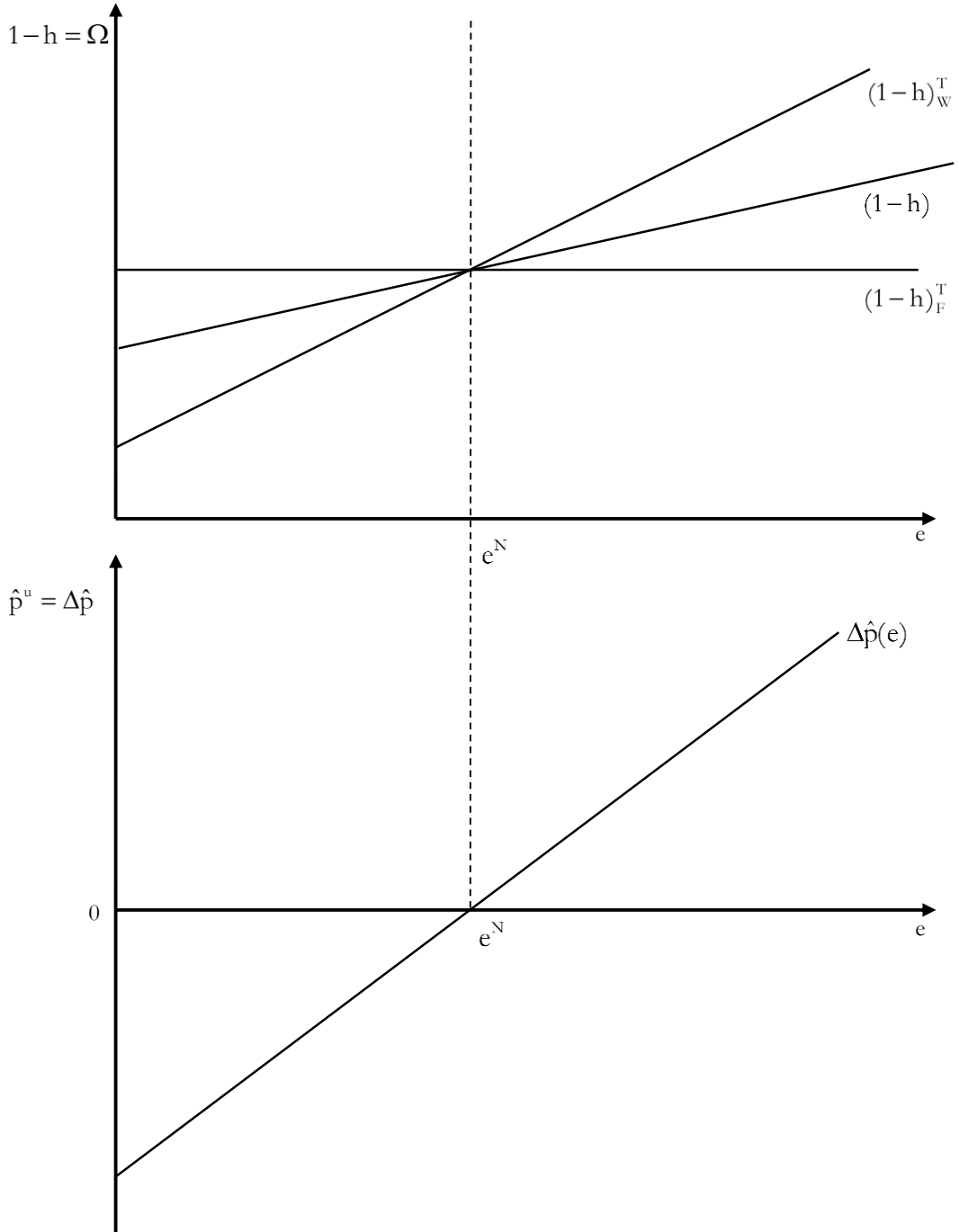
With adaptive expectations ($\hat{p}_t^e = \hat{p}_{t-1}$), we obtain the following short-run Phillips curve from equation (4.6):

$$(4.10)\quad \hat{p}_t^u = \hat{p}_t - \hat{p}_t^e = \hat{p}_t - \hat{p}_{t-1} = \Delta\hat{p}_t = \frac{\Omega_0 + \Omega_1 e + h_0 - 1}{\Omega_2 + h_2},$$

and hence:

$$(4.11)\quad \hat{p}_t = \hat{p}_{t-1} + \frac{\Omega_0 + \Omega_1 e + h_0 - 1}{\Omega_2 + h_2}.$$

Figure 4.1: Conflicting claims, inflation and distribution



4.2 Unexpected inflation and distribution between rentiers and firms

Division of total profits

(4.12) $\Pi = \Pi_F + R$.

The expected or the 'ex ante' real interest rate:

(4.13) $i_r^e = i - \hat{p}^e$.

The actual or 'ex post' real interest rate:

(4.14) $i_r = i - \hat{p} = i - \left(\hat{p}^e + \hat{p}^u\right) = i_r^e - \hat{p}^u$.

Expected or 'ex ante' rentiers income

(4.15) $R^e = iB = \left(i_r^e + \hat{p}^e\right)B = i_r^e B + \hat{p}^e B$.

Rentiers' 'real' ex post income:

(4.16) $R = \left(i - \hat{p}^u\right)B = \left(i_r^e + \hat{p}^e - \hat{p}^u\right)B = R^e - \hat{p}^u B$.

Table 4.1: Inflation and distribution effects of deviations of the employment rate from the SIRE or of deviations of the unemployment rate from the NAIRU

	$\hat{p}^u$	$\Omega(e)-\Omega(e^N)$	$h(e)-h(e^N)$	$\frac{\Pi_F}{\Pi}(e)-\frac{\Pi_F}{\Pi}(e^N)$	$\frac{R}{\Pi}(e)-\frac{R}{\Pi}(e^N)$
$e > e^N(SIRE)$ $u < NAIRU$	+	+	−	+	−
$e = e^N(SIRE)$ $u = NAIRU$	0	0	0	0	0
$e < e^N(SIRE)$ $u > NAIRU$	−	−	+	−	+

4.3 The goods market equilibrium with distribution conflict and unexpected inflation

Saving in real terms:

(4.17) $S_r = hY - (1 - s_R) i_r B, \qquad 1 \geq s_R > 0 .$

Real investment:

(4.18) $I = I_a + \beta Y - \theta i_r B, \qquad I_a, \beta, \theta \geq 0 .$

Deficit-financed government demand is exogenous:

(4.19) $G_r = D = \bar{G}_r$

G: government demand, D: government deficit

Equilibrium at

(4.20) $I + G_r = S_r .$

Stability condition

(4.21) $\frac{\partial S_r}{\partial Y} > \frac{\partial I}{\partial Y} \Rightarrow h - \beta > 0 .$

From equations (4.17) – (4.20): an ‘ex ante’ goods market equilibrium including the target or expected values for the profit share (h_0) and for the interest rate (i_r^e):

(4.22) $$Y^e = \frac{G_r + I_a + (1 - s_R - \theta) i_r^e B}{h_0 - \beta} .$$

Since $y = Y / N \Leftrightarrow N = Y / y$, with a given labour force (LF), the rate of employment ($e = N / LF$) changes in proportion with output and income, because we have $e = Y / (y\,LF) = Yx$ with $x = 1 / (y\,LF)$:

(4.23) $$e^e = \frac{x\left[G_r + I_a + (1 - s_R - \theta) i_r^e B\right]}{h_0 - \beta} .$$

➔ ‚ex ante‘ goods market equilibrium rate of employment

Deviaton of ‘ex ante’ goods market equilibrium rate of employment in equation (32) from SIRE in equation (15):

➔ unexpected inflation

➔ change in distribution between capital and labour and between rentiers and firms

➔ changes in consumption, saving and investment

➔ change in goods market equilibrium

Ex post goods market equilibrium rate of employment

(4.24) $$e^{p} = \frac{x\left[G_r + I_a + \left(1 - s_R - \theta\right)\left(i - \hat{p}^{e} - \hat{p}^{u}\right)B\right]}{h_0 - h_2\hat{p}^{u} - \beta}.$$

Effect of unexpected inflation:

(4.24a) $$\frac{\partial e^{p}}{\partial \hat{p}^{u}} = \frac{h_2 e^{p} - x\left(1 - s_R - \theta\right)B}{h_0 - h_2 \hat{p}^{u} - \beta} .$$

1. Redistribution from gross profits to wages is expansionary

2. Effect of redistribution from rentiers to firms is unclear

a) $1-s_R - \theta > 0$: 'puzzling case'

b) $1-s_R - \theta < 0$: 'normal case'

➔ assume 'normal case' to hold

➔ unexpected inflation will increase deviation of goods market equilibrium rate of employment from SIRE

Figure 4.2: Stable inflation rate of employment (e^N), ex ante (e^e) and ex post (e^p) goods market equilibrium rate of employment with a strong effect of unexpected inflation on employment

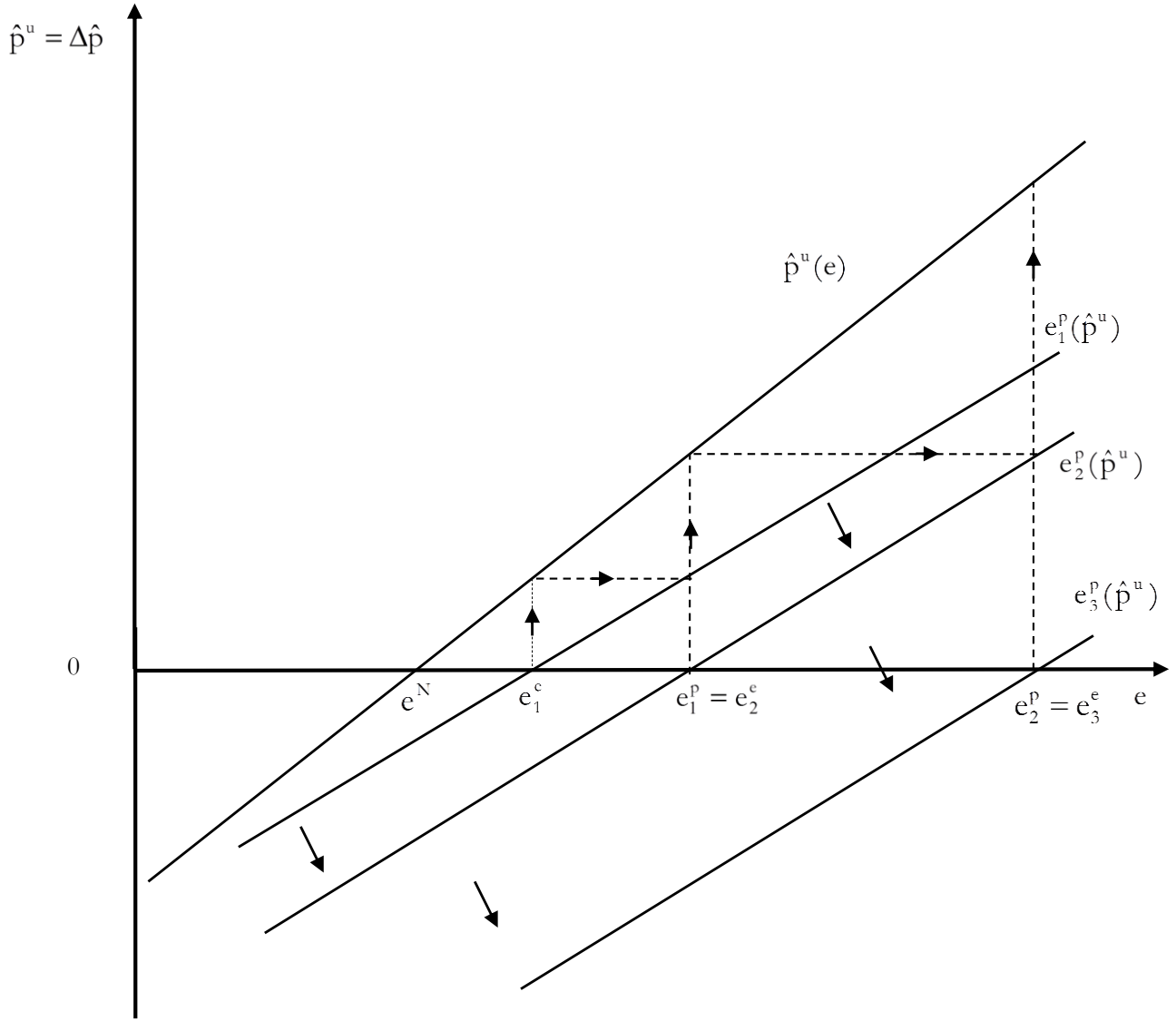
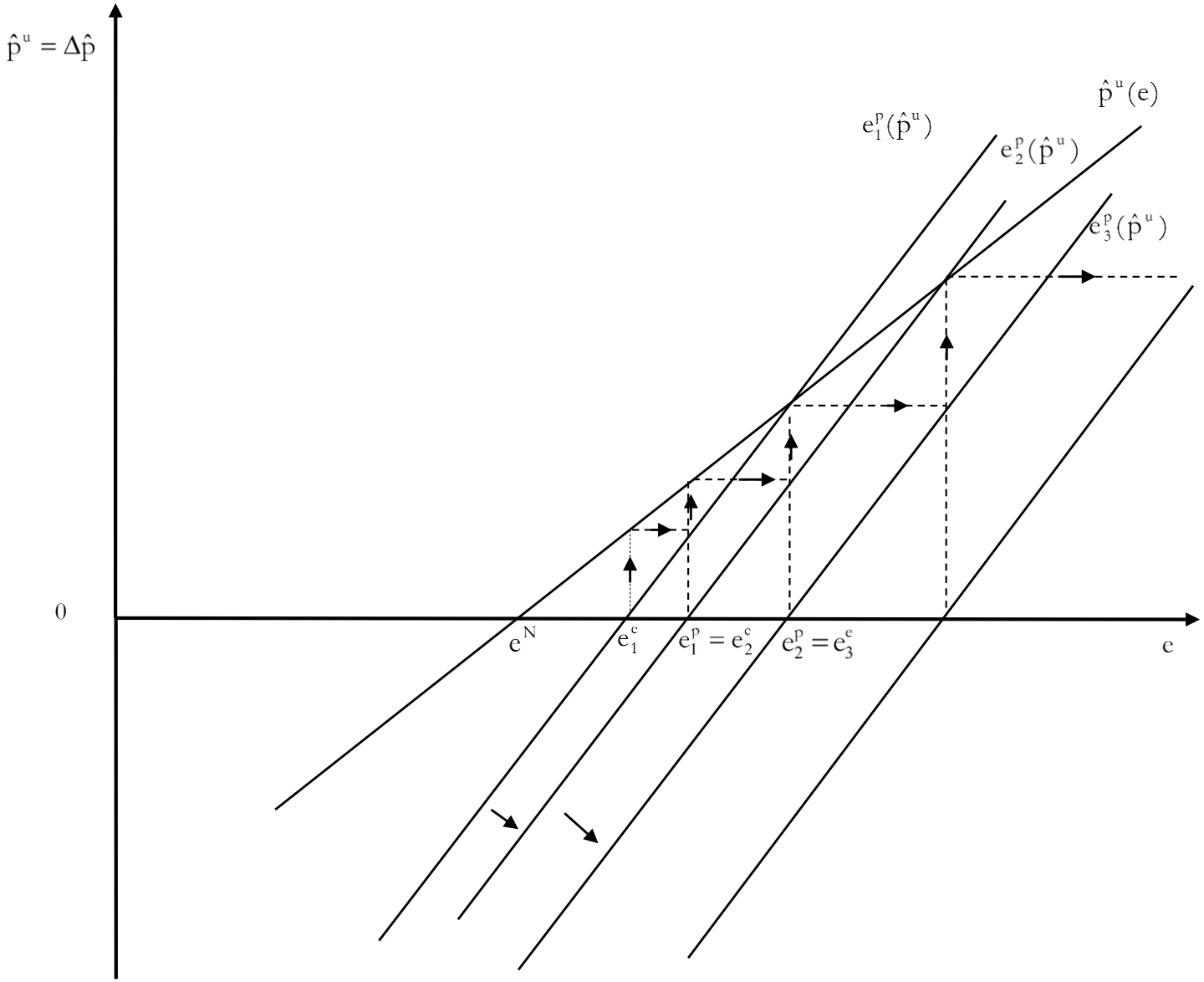


Figure 4.3: Stable inflation rate of employment (e^N), ex ante (e^e) and ex post (e^p) goods market equilibrium rate of employment with a weak effect of unexpected inflation on employment



4.4 An inflation-targeting central bank as short-run stabiliser?

Central bank's inflation target equals expected inflation: $\hat{p}^T = \hat{p}^e$

Only aim of the central bank is to eliminata unexpected inflation

Central bank reaction function:

$$
\begin{aligned}
i &= i^e_{r0} + \hat{p} + \gamma\left(\hat{p} - \hat{p}^T\right) \\
&= i^e_{r0} + \hat{p}^e + \hat{p}^u + \gamma\left(\hat{p} - \hat{p}^e\right) \\
&= i^e_{r0} + \hat{p}^e + (1+\gamma)\hat{p}^u,
\end{aligned}
\qquad (4.25)
$$

$$0 \le i^e_{r0}, 0 < \gamma$$

i^e_{r0} : central bank's estimation of the 'equilibrium real interest rate'

$$(4.24b)\ \frac{\partial e^{cb}}{\partial i} = \frac{xB\left(1 - s_R - \theta\right)}{h_0 - h_2\hat{p}^u - \beta}.$$

With 'normal case' ($1-s_R-\theta<0$) ➔ inverse effect of MP on economic activity

Figure 4.4: An inflation-targeting central bank monotonically stabilising the ex post goods market equilibrium rate of employment (e^{cb}) towards the SIRE (e^N)

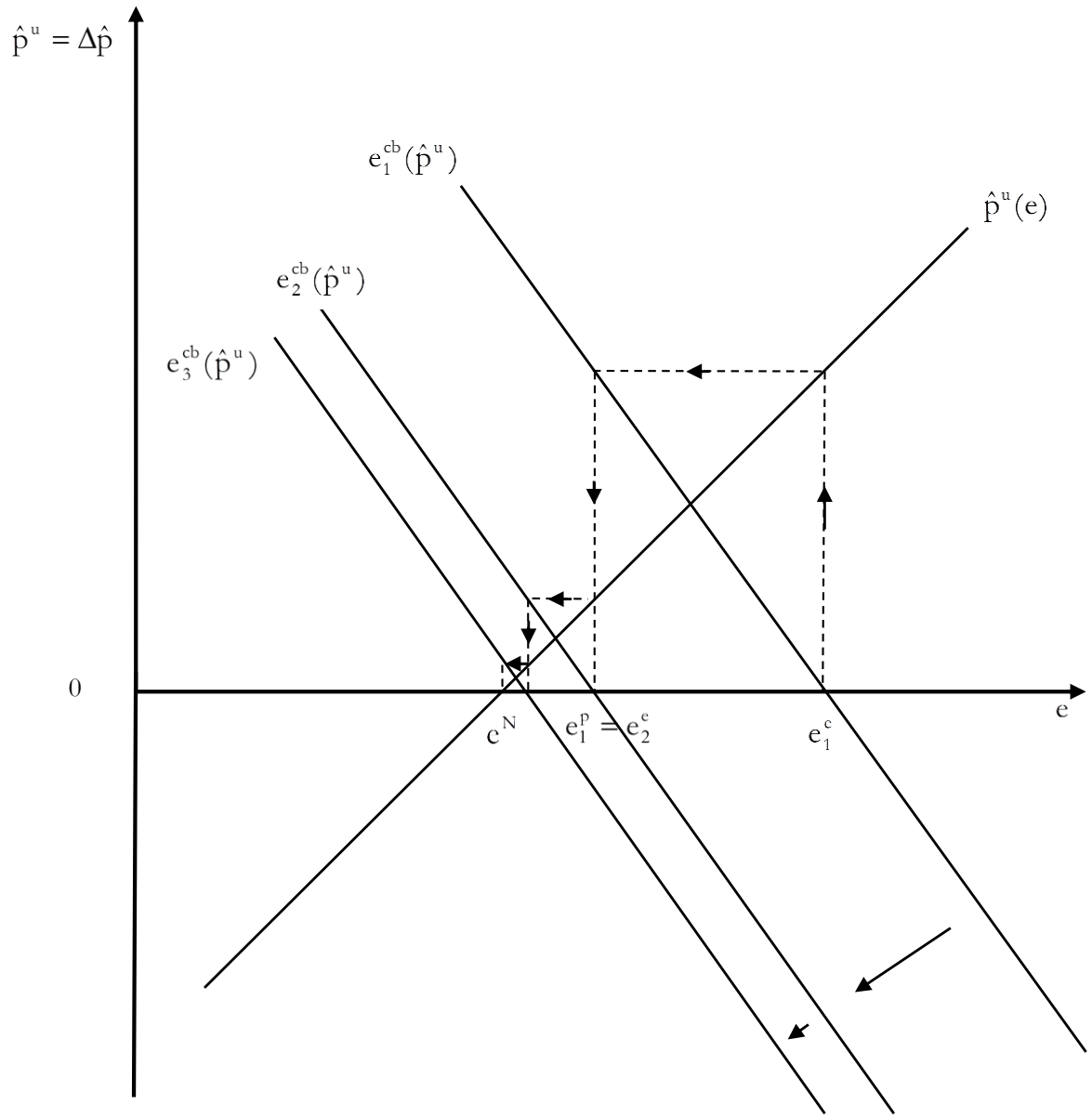


Figure 4.5: An inflation-targeting central bank cyclically stabilising the ex post goods market equilibrium rate of employment (e^{cb}) towards the SIRE (e^N)

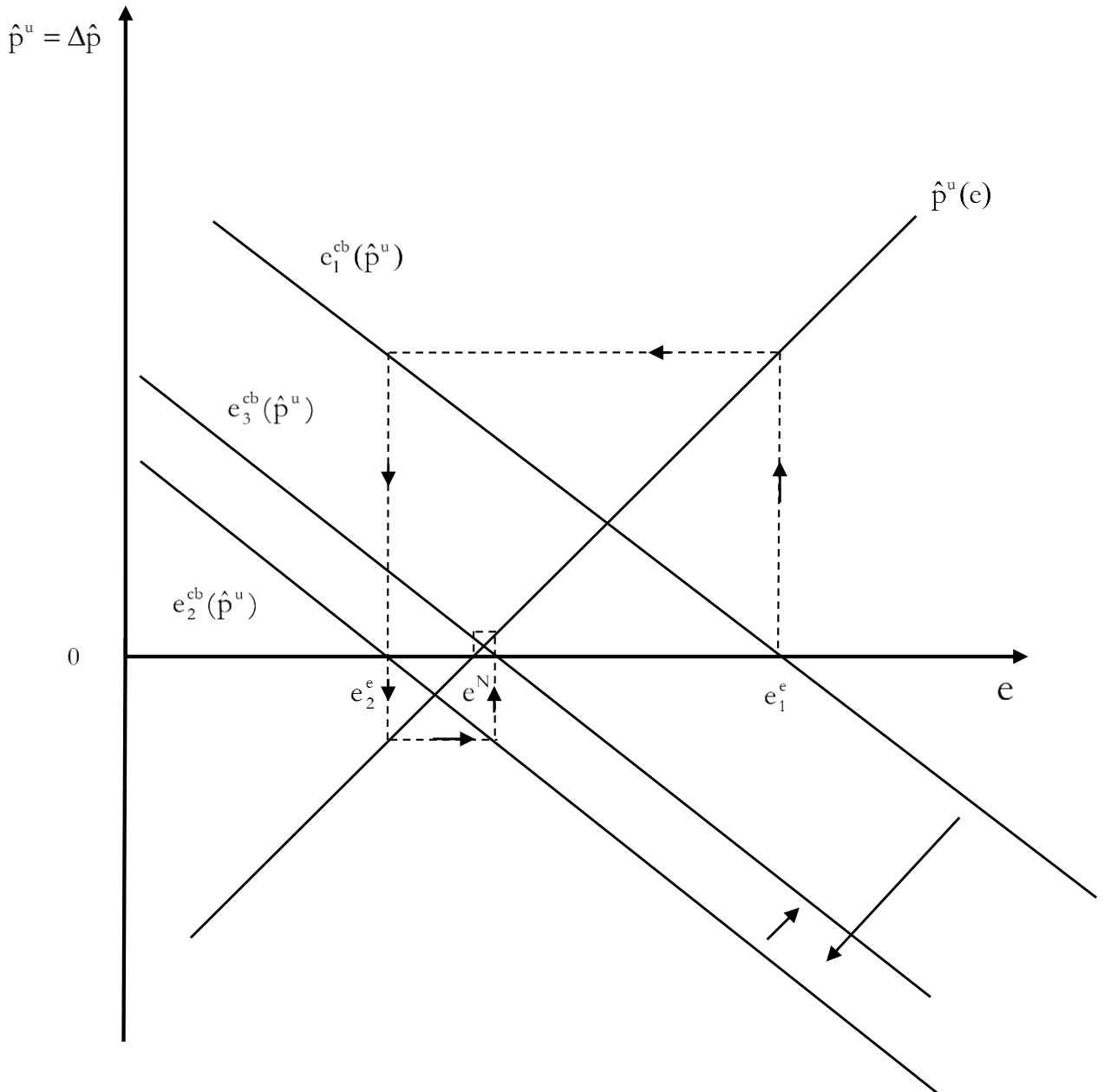
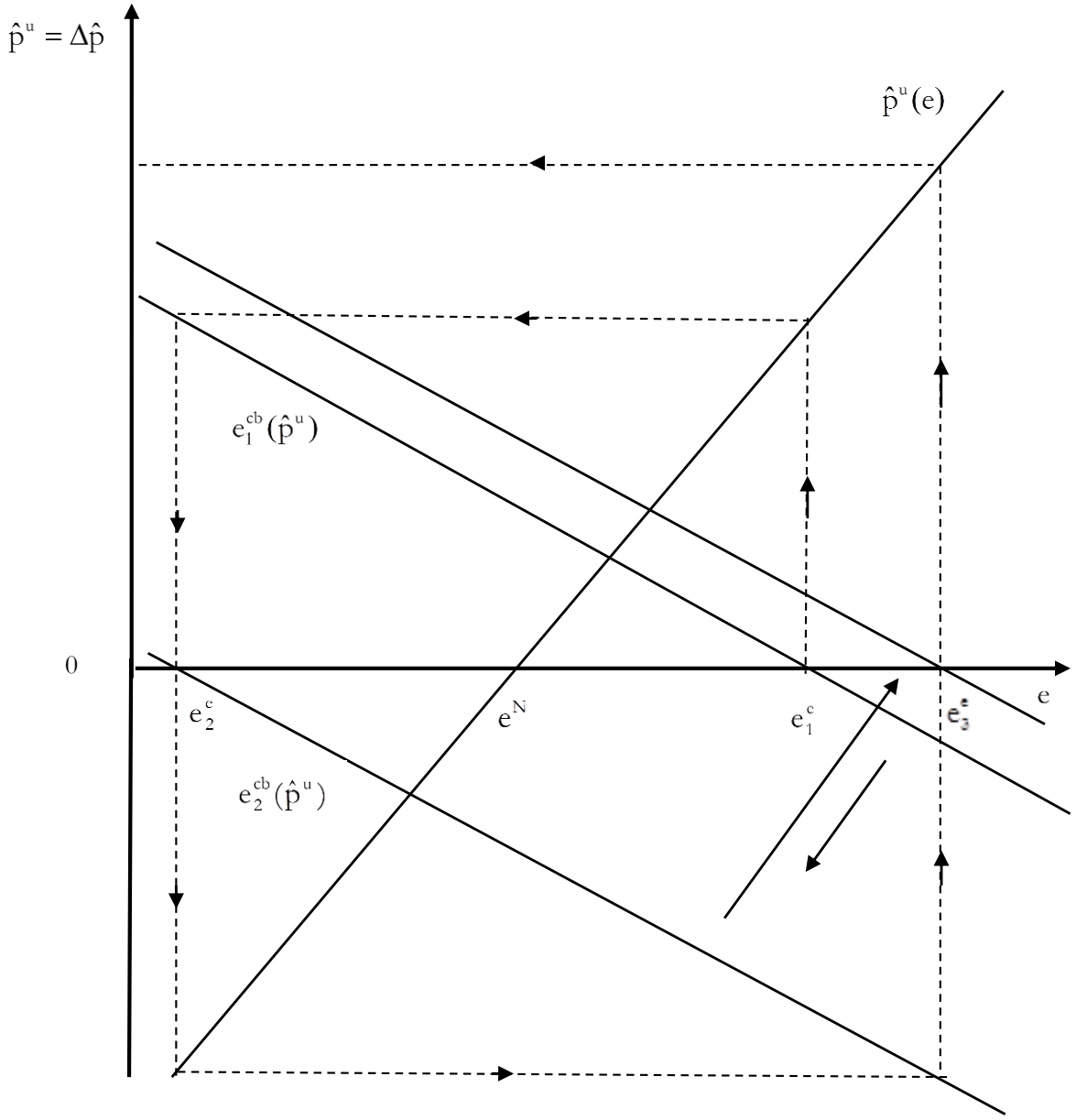


Figure 4.6: An inflation-targeting central bank de-stabilising the ex post goods market equilibrium rate of employment (e^{cb})



Problems for monetary policies as a stabiliser

1. For a stable monotonic adjustment, as in Figure 4.4, we need a steep ('ex post') goods market equilibrium employment curve incorporating monetary policy responses (e^{cb}), which indicates only weakly contractive effects of the interest rate policy of the central bank.
➔ central banks have to be careful in their responses

2. Zero (or positive) lower bound for nominal interest rate
➔ ineffectiveness with low inflation or deflation

3. Asymmetric effects of changes in central bank rate on credit market rates
➔ potential ineffectiveness in lowering credit market rates in a crisis

4. Fall in firms' animal spirits (I_a)
➔ potential ineffectiveness in stimulating demand in a deep recession

4.5 Medium- to long-run endogeneity of the SIRE and the NAIRU

a. Insider bargaining or deskilling of the unemployed may dampen the wage effects of unemployment (Ball 1999, Blanchard/Summers 1987, 1988);

b. Conventional wage norms may endogenise the wage targets of workers (Skott 2005, Stockhammer 2008);

c. Capital shortages may affect equilibrium employment if mark-up is affected by long-run capacity utilisation (Arestis/Sawyer 2004, 2005, Rowthorn 1995, 1999, Sawyer 2001, 2002);

d. Changes in the 'ex ante' real interest rate will affect the NAIRU, because firms have to increase mark ups to cover increased interest costs (Hein 2006, 2008).

Persistence mechanisms in the labour market

- persistent unemployment and an increasing share of long-term unemployment in total unemployment, with the associated loss of skills and access to firms by the long-term unemployed, will decrease the pressure of a given rate of unemployment on labour unions' or insiders' target real wage share and hence on nominal wage demands
- share of the long-term unemployed in total unemployment increases when the unemployment rate exceeds some threshold, which is given by frictional unemployment caused by the 'normal' working of the labour market in the face of changing demand patterns and structural as well as regional change. The employment rate hence falls short of a 'full employment' rate (e^f) associated with this rate of unemployment

➔ workers' target wage share for a given total rate of employment will increase

When the goods market equilibrium rate of employment persistently falls short of full employment, long-term unemployment will arise and the workers' target wage share for a given total rate of employment will increase

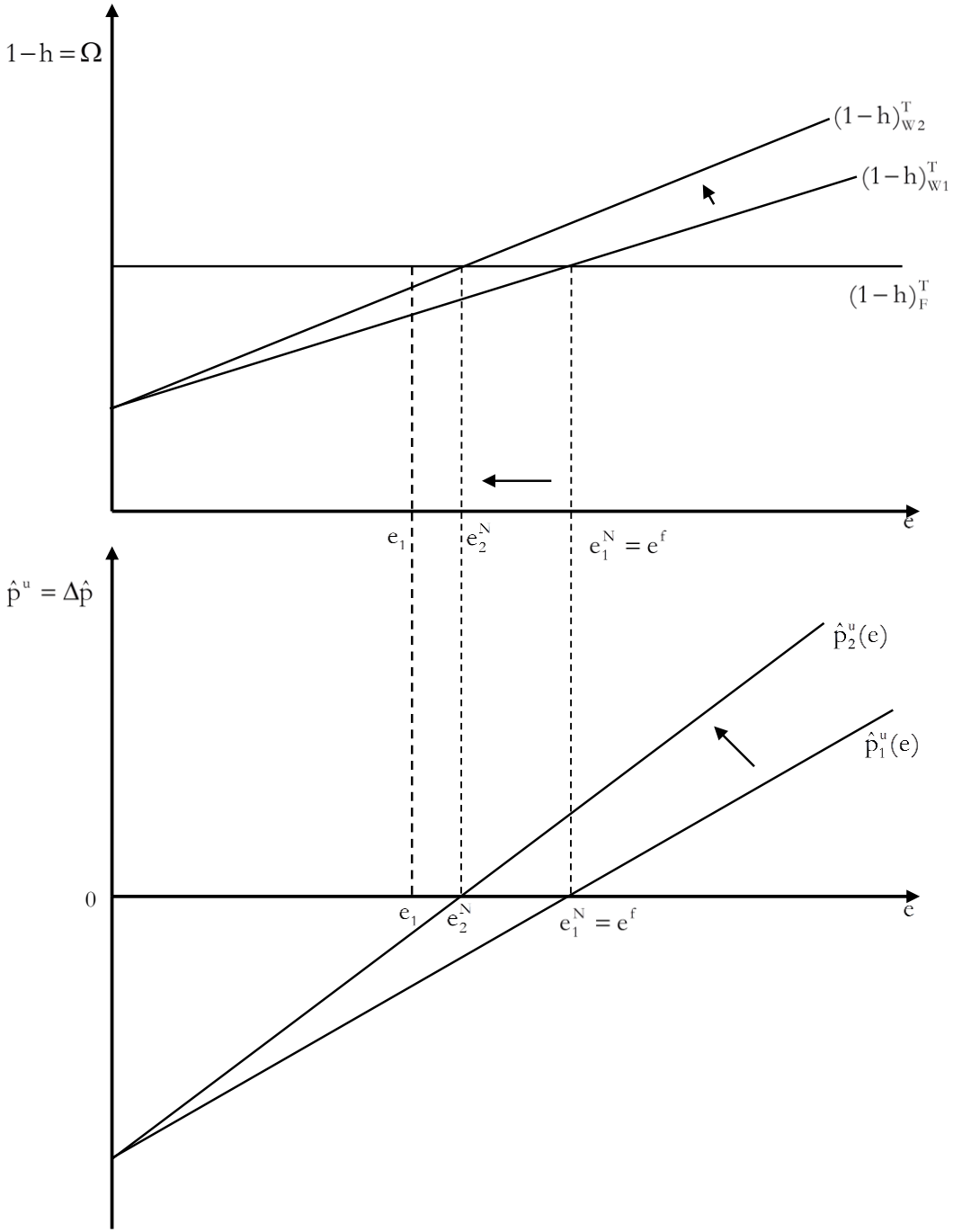
(4.26) $$(1-h)^{T}_{W} = \Omega^{T}_{W} = \Omega_0 + \Omega_1\left[e + \phi(e^{f} - e)\right], \qquad 0 \le \phi .$$

Combining equation (35) with firms' target profit share from equation (11) we get for the SIRE:

(4.27) $$e^{N} = \frac{1 - \Omega_0 - \Omega_1\phi(e^{f} - e) - h_0}{\Omega_1} .$$

(4.27a) $$\frac{\partial e^{N}}{\partial(e^{f} - e)} = -\phi < 0 .$$

Figure 4.7: Labour market persistence mechanisms and the SIRE



Wage aspirations based on conventional behaviour

- Wage earners adjust target, if actual wage share (or rate) persistentyl deviates from target

➔ workers get used to actual distribution

➔ shift in workers‘ target wage share

(4.28) $$(1-h)_W^T = \Omega_W^T = \Omega_0 + \Omega_1 e + \Omega_3 \left[(1-h) - (1-h)_W^T\right] = \frac{\Omega_0 + \Omega_1 e + \Omega_3 (1-h)}{1+\Omega_3},$$

$$0 < \Omega_0 < 1, \qquad 0 \le \Omega_1, \Omega_3.$$

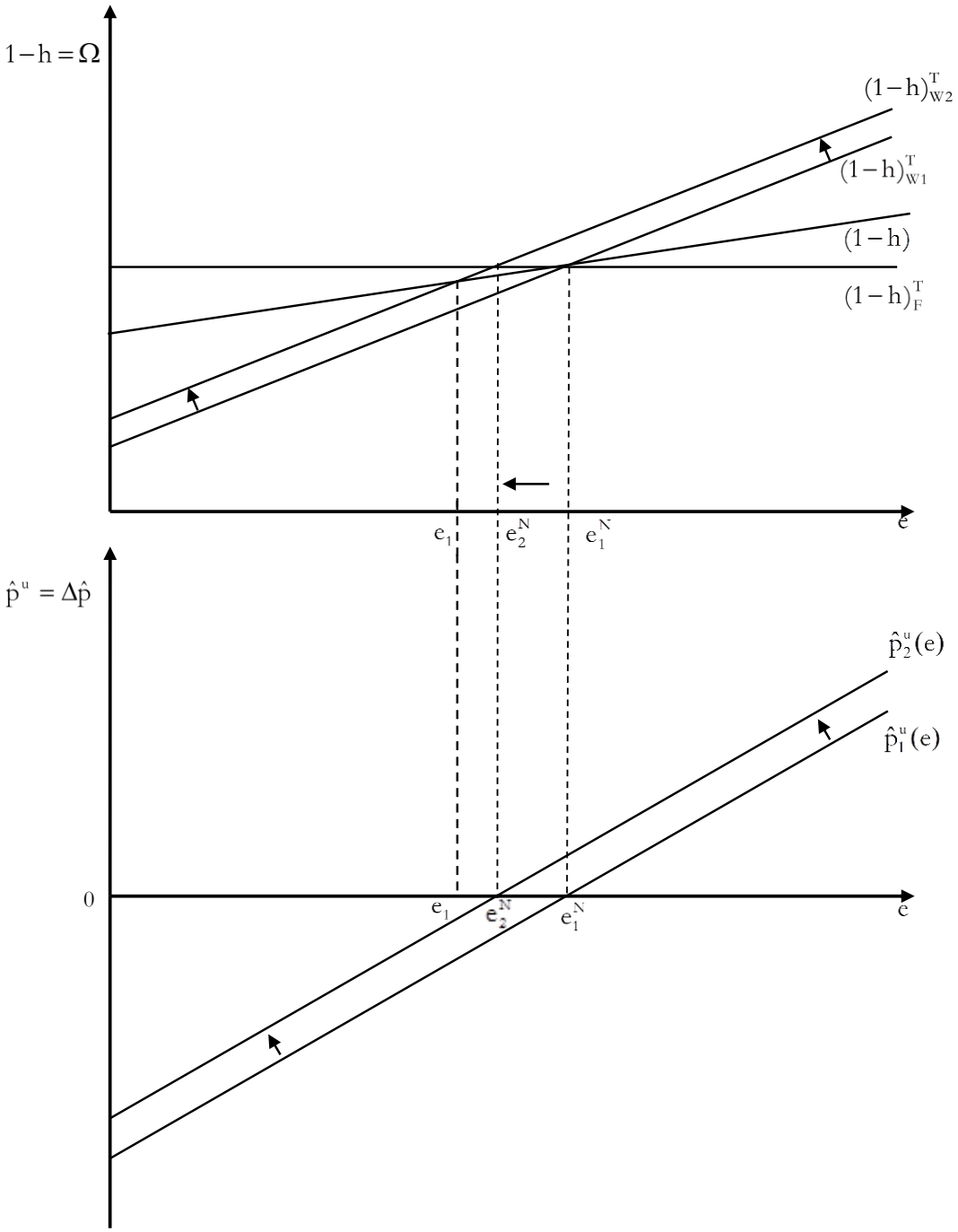
Combining equation (4.28) with the firms' target profit share from equation (4.1), the SIRE becomes:

(4.29) $$e^N = \frac{(1-h_0)(1+\Omega_3) - \Omega_0 - \Omega_3 (1-h)}{\Omega_1}.$$

A deviation of the actual wage share from the workers' target share has the following effect on the stable-inflation rate of employment:

(4.29a) $$\frac{\partial e^N}{\partial (1-h)} = -\frac{\Omega_3}{\Omega_1} < 0.$$

Figure 4.8: Endogenous wage aspirations and the SIRE



The effect of investment in capital stock

- Firms target mark-up is positively related to capacity utilisation in the long run
- The lower investment and thus the increase in the capital stock, the higher will be long-run capacity utilisation (z), if autonomous components of demand grow at a constant rate, and the higher will be the firms' target profit share
- Weak investment, low demand and hence a rate of employment below the stable inflation rate makes firms' target wage share curve shift downwards, the SIRE decreases, the NAIRU rises, and the Phillips curve shifts upwards.

(4.30) $h_F^T = h_0 + h_1 z, \qquad 0 < h_0, 0 \leq h_1$.

With z = Y/K

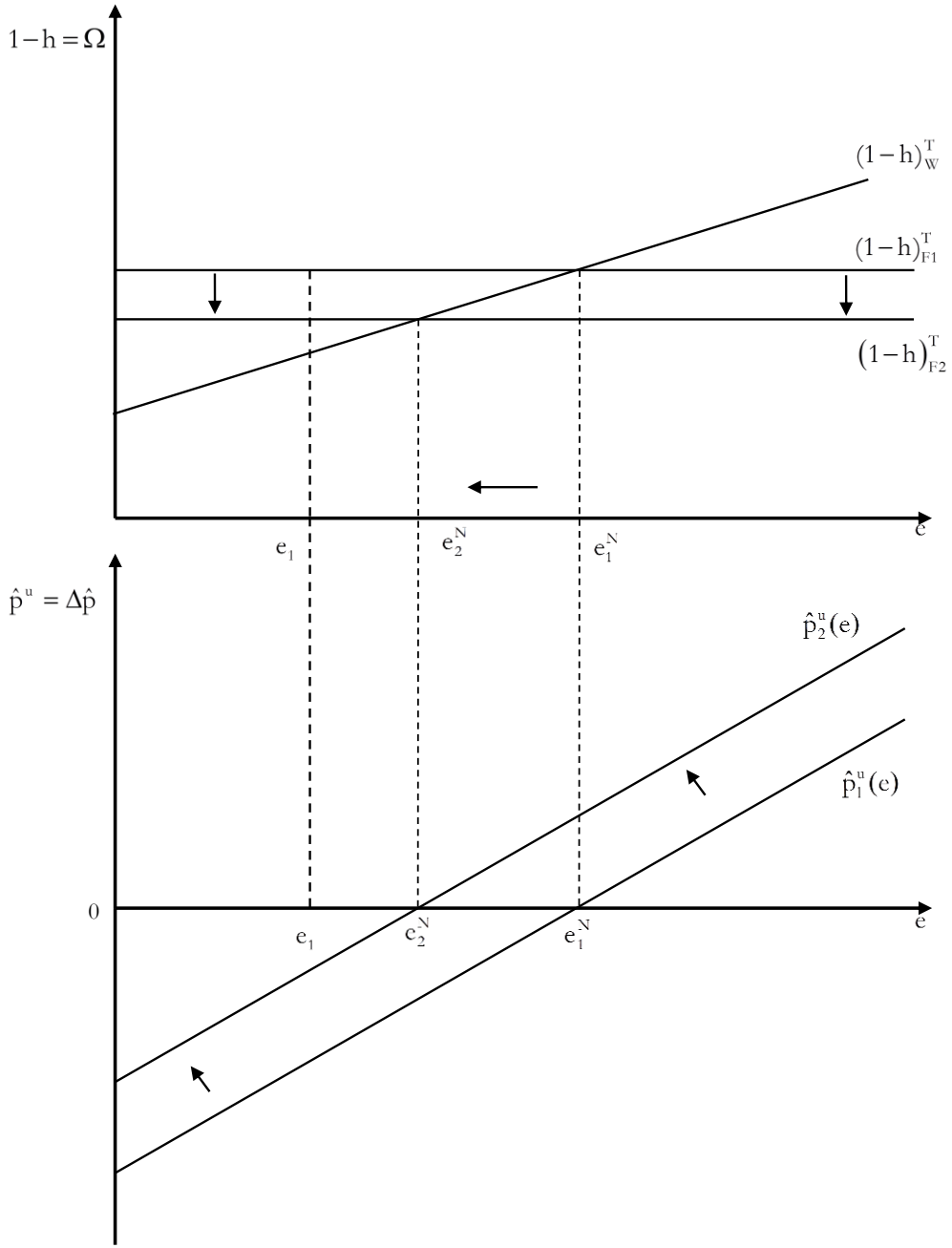
Taking into workers' target wage share from equation (4.2), we get for the SIRE:

(4.31) $e^N = \frac{1 - \Omega_o - h_0 - h_1 z}{\Omega_1}$.

From this we obtain for the effect of capacity utilisation, which, under the conditions mentioned above, is negatively affected by the capacity effects of investment in the medium to long run:

(4.31a) $\frac{\partial e^N}{\partial z} = -\frac{h_1}{\Omega_1} < 0$.

Figure 4.9: Low investment in the short run, higher capacity utilisation in the long run and the SIRE



The interest cost channel

With accelerating inflation, higher interest rates induced by inflation targeting central bank policies are able to adjust employment towards the SIRE

Surviving firms are facing higher interest costs which have to be covered by the mark up

Increase in firms' target profit share, which lowers SIRE and may generate inflation again.

(4.32) $h_F^T = h_0 + h_3 i_r^e, \qquad 0 < h_0,\ 0 \le h_3$.

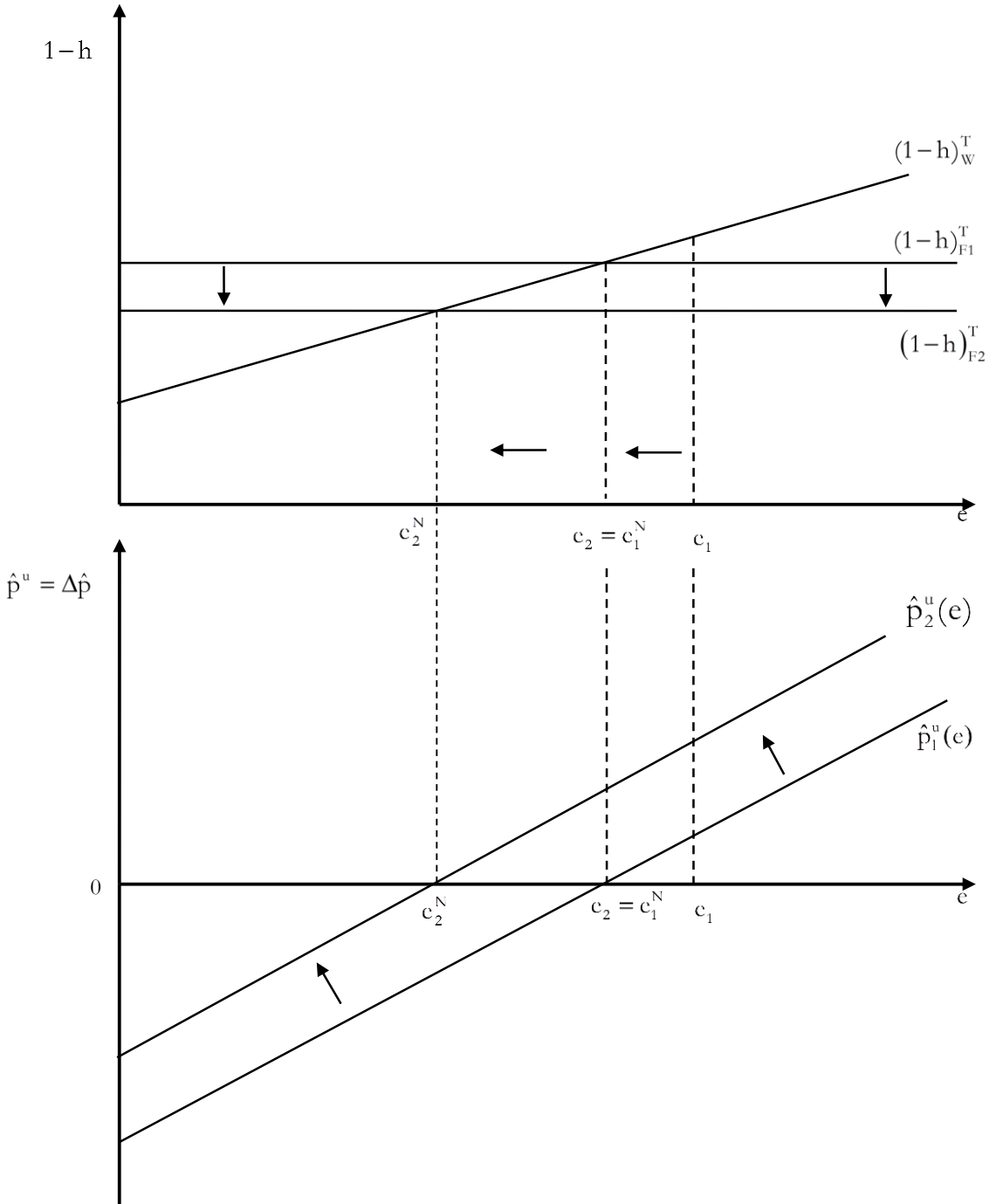
Taking into account the workers' target wage share from equation (4.2), we obtain the following stable-inflation rate of employment:

(4.33) $$e^N = \frac{1 - \Omega_o - h_0 - h_3 i_r^e}{\Omega_1}.$$

A persistent change in the 'ex ante' real interest rate will have an inverse effect on the stable-inflation rate of employment:

(4.33a) $$\frac{\partial e^N}{\partial i_r^e} = -\frac{h_3}{\Omega_1} < 0.$$

Figure 4.10: Persistent change in the 'ex ante' real rate of interest and the SIRE



4.6 A post-Keynesian macroeconomic policy mix

Monetary policy:

- refrain from fine tuning inflation or employment

- target a constant rate of interest ('parking it')
  (Rochon/Setterfield 2007)

- responsibility for stability of financial system
- definition of credit standards and creditworthiness
- reserve requirements and capital controls to prevent bubbles
- 'lender of last resort' in the case of systemic crises
- guarantor of public debt

Parking it targets (or rules):

- zero nominal overnight rate (Kansas City rule, Wray (2007))
- (close to) zero real long-term rate of interest (Smithin rule, Smithin (2007))
- real long-term rate equal to productivity growth (Pasinetti rule, Lavoie (1996))

Central bank long-term interest rate target (i^T):

(4.34) $$i^T = i^e_{r0} + \hat{p} = i^e_{r0} + \hat{p}^e + \hat{p}^u ,$$

$i^e_{r0} = \hat{y}$ given by medium-run productivity growth.

Since $i = (1 + m_B) i_{CB}$, it follows for central bank interest rate:

(4.35) $$i^{CB} = \frac{i^T}{(1+m_B)} = \frac{i^e_{r0} + \hat{p}}{(1+m_B)} = \frac{i^e_{r0} + \hat{p}^e + \hat{p}^u}{(1+m_B)} .$$

Wage/incomes policy

- target nominal stabilisation and stable distribution

➔ nominal unit labour costs should grow at a rate similar to the country's inflation target

➔ only if other distribution claims (profits, state, external sector) are reduced, redistribution via wage policy is possible without triggering unexpected inflation and instability

Target nominal wage growth:

(4.36) $\hat{w} = \hat{y} + \hat{p}^T$.

$\hat{y}$: long-run productivity growth

$$\Omega_W^T = (1-h)_W^T = (1-h)_F^T = h_0 \text{, if: } e_1^N < e < e_2^N$$

(4.37) and

$$\Omega_W^T = (1-h)_W^T = \Omega_0 + \Omega_1 e \text{, if: } e < e_1^N \text{ or } e_2^N < e$$

The SIRE and hence the NAIRU becomes a range and the Phillips curve becomes a horizontal line between e_1^N and e_2^N (see Figure 4.11):

$$\hat{p}_t^u = \frac{\Omega_0 + \Omega_1 e + h_0 - 1}{\Omega_2 + h_2} \text{, if: } e < e_1^N \text{ or } e_2^N < e,$$

(4.38) and

$$\hat{p}_t^u = 0 \text{, if: } e_1^N < e < e_2^N .$$

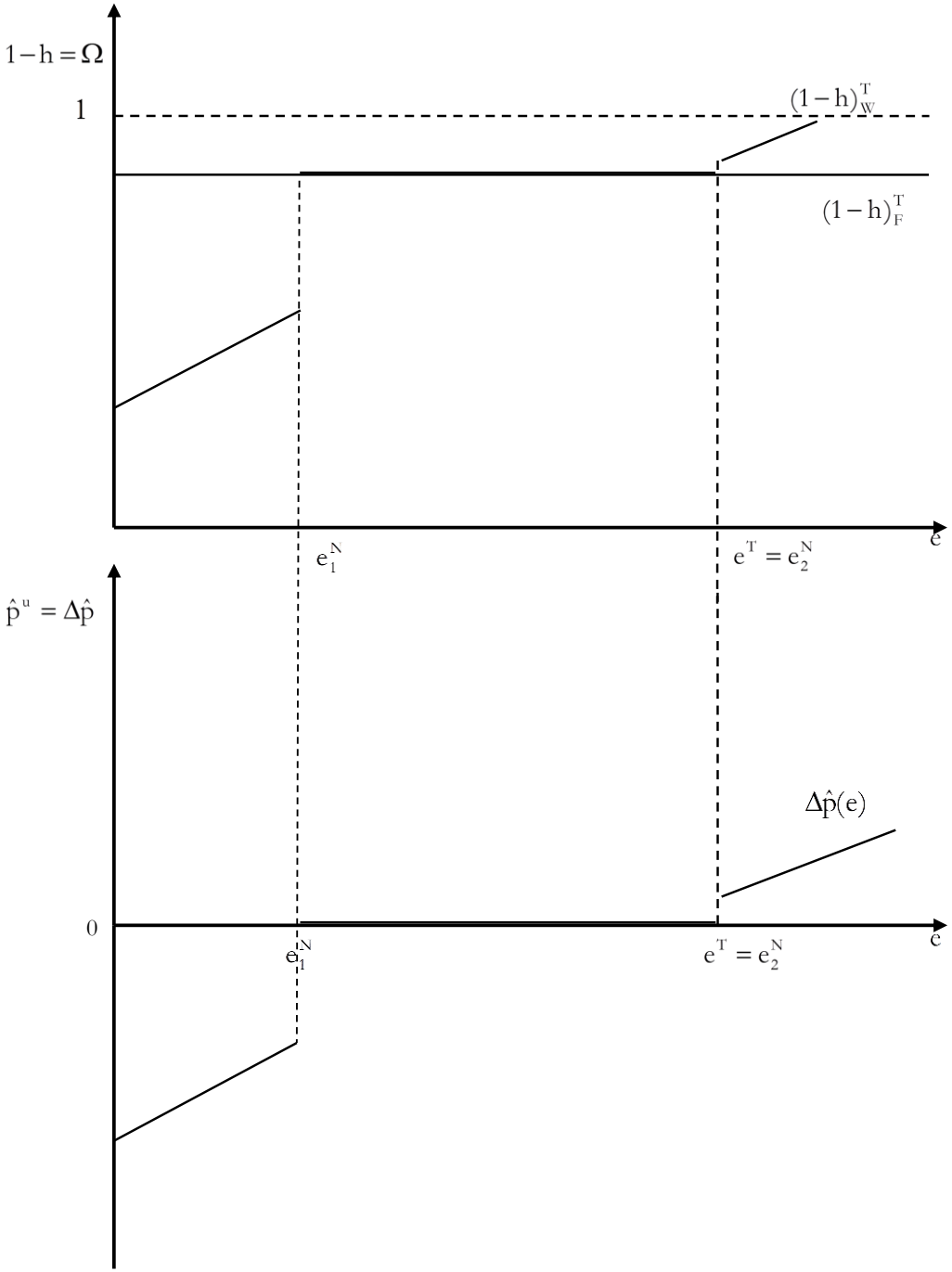
Institutional requirements:

- wage bargaining coordination focussing on consistent distribution targets
    - high coordination at national level,
    - strong trade unions and employer association,
    - government involvement, ...

➔ Phillips curve becomes (partly) horizontal

➔ Demand management can choose high level of employment without triggering unexpected inflation

Figure 4.11: Results of a post-Keynesian macroeconomic policy mix



Fiscal policy

- Real stabilisation in the short and the long run
- redistribution policies supports stabilisation
- take endogeneity of inflation barrier into account

Long-run government deficit (functional finance):
G – T = S – pI, with X – M = 0 at long-run stable inflation employment rate (focus on government investment)

➔ Stable government debt-GDP-ratio

➔ redistribution in favour of rentiers is prevented by $i \leq \hat{Y}^n$,

➔ public debt stabilises financial markets (safe haven)

Stabilise the economy in the face of shocks:

➔ automatic stabilisers + discretion

Progressive taxation (income + wealth) and social policies
➔ improve income distribution
➔ reduction of S – I and thus G – T
➔ improve automatic stabilisers.

Fiscal policy guideline:

(4.39) $D_r = G_r = G_{r0} + G_{r1}(e^T - e), \quad 0 < G_{r1}$,

G_{r0}: permanent government deficit or surplus, which is required to keep employment at target (e^T) in the medium run,
G_{r1}: the reaction in the case of short-run deviations of employment from target.

Digression: Sectoral financial balances

- $S - I = G - T + Ex - Im$
- $FB_{PS} = - FB_{ST} - FB_{ES}$
- $FB_{PS} + FB_{ST} + FB_{ES} = 0$

Digression on government debt dynamics

A constant government debt-GDP ratio (B_G/Y^n) requires that government debt (B_G) and nominal GDP ($pY=Y^n$) grow at the same rate:

(4.40) $$\hat{B}_G = \frac{dB_G}{B_G} = \hat{Y}^n = \frac{dY^n}{Y^n}.$$

Since the government deficit (D) is given by:

(4.41) $$D = G - T = dB_G,$$

with G representing government expenditures and T government revenues (taxes etc.), equation (4.40) becomes:

(4.42) $$\hat{B}_G = \frac{dB_G}{B_G} = \frac{D}{B_G} = \frac{\frac{D}{Y^n}}{\frac{B_G}{Y^n}} = \hat{Y}^n \quad \Rightarrow \quad \frac{B_G}{Y^n} = \frac{\frac{D}{Y^n}}{\hat{Y}^n}.$$

With a constant government deficit-GDP ratio and a constant nominal rate of growth of the economy, the government debt-GDP ratio will thus converge towards a definite value.

The government deficit can now be decomposed into a primary deficit (D') and the interest payments on the stock of government debt (iB_G):

(4.43) $D = D' + iB_G$.

Inserting this into equation (51) yields:

(4.44) $$\frac{B_G}{Y^n} = \frac{\frac{D' + iB_G}{Y^n}}{\hat{Y}^n} = \frac{\frac{D'}{Y^n} + \frac{iB_G}{Y^n}}{\hat{Y}^n} .$$

With a balanced primary budget, $D' = 0$, and hence $D = iB$, governments can thus service their debt by their current government deficits, and stabilise the government debt-GDP ratio – provided that nominal GDP growth is positive.

Rearranging equation (4.44) gives:

(4.45) $$\frac{B_G}{Y^n} = \frac{\frac{D'}{Y^n}}{\hat{Y}^n - i}.$$

If the growth rate of nominal GDP exceeds the nominal interest rate on government debt, governments can also run a primary deficit-GDP ratio without compromising a long-run stable government debt-GDP ratio. However, if nominal GDP growth falls short of the nominal rate of interest, stabilising the government debt-GDP ratio will require a primary surplus in the government budget – and thus implies the use of tax revenues in order to satisfy the income demands of the rentiers holding government debt.

➔ coordination with central banks keeping targeting long-term interest rate below growth

Table 4.2: Macroeconomic policy recommendations: New Consensus models (NCM) and post-Keynesian models (PKM) compared		
	NCM	**PKM**
Monetary policy	Inflation targeting by means of interest rate policies, which affects unemployment in the short run, but only inflation in the long run	Target low interest rates which mainly affect distribution, and stabilise monetary, financial and real sectors by applying other instruments (lender of last resort, credit controls, guarantor of public debt)
Labour market and wage/incomes policy	Determines the NAIRU in the long run and the speed of adjustment in the short run; focus should be on flexible nominal and real wages	Affects price level/inflation and distribution; focus should be on rigid nominal wages, steady nominal unit labour cost growth and compressed wage structure
Fiscal policy	Supports monetary policy in achieving price stability by balancing the budget over the cycle	Real stabilisation in the short and in the long run with no autonomous deficit targets; affects distribution of disposable income
Co-ordination	Clear assignment in the long run; co-ordination at best only in the short run	No clear assignment; economic policy co-ordination required in the short and the long run

Source: Based on Hein (2017, p. 154)

Finally …

- Don‘t take maximum SIRE or minimum NAIRU as given
- Test the waters …
- Make use of long-run endogeneity channels of expansionary policies ...

Figure 4.12: Expansionary macroeconomic policies raising the SIRE through the labour market persistence mechanisms and a lower target wage share of workers

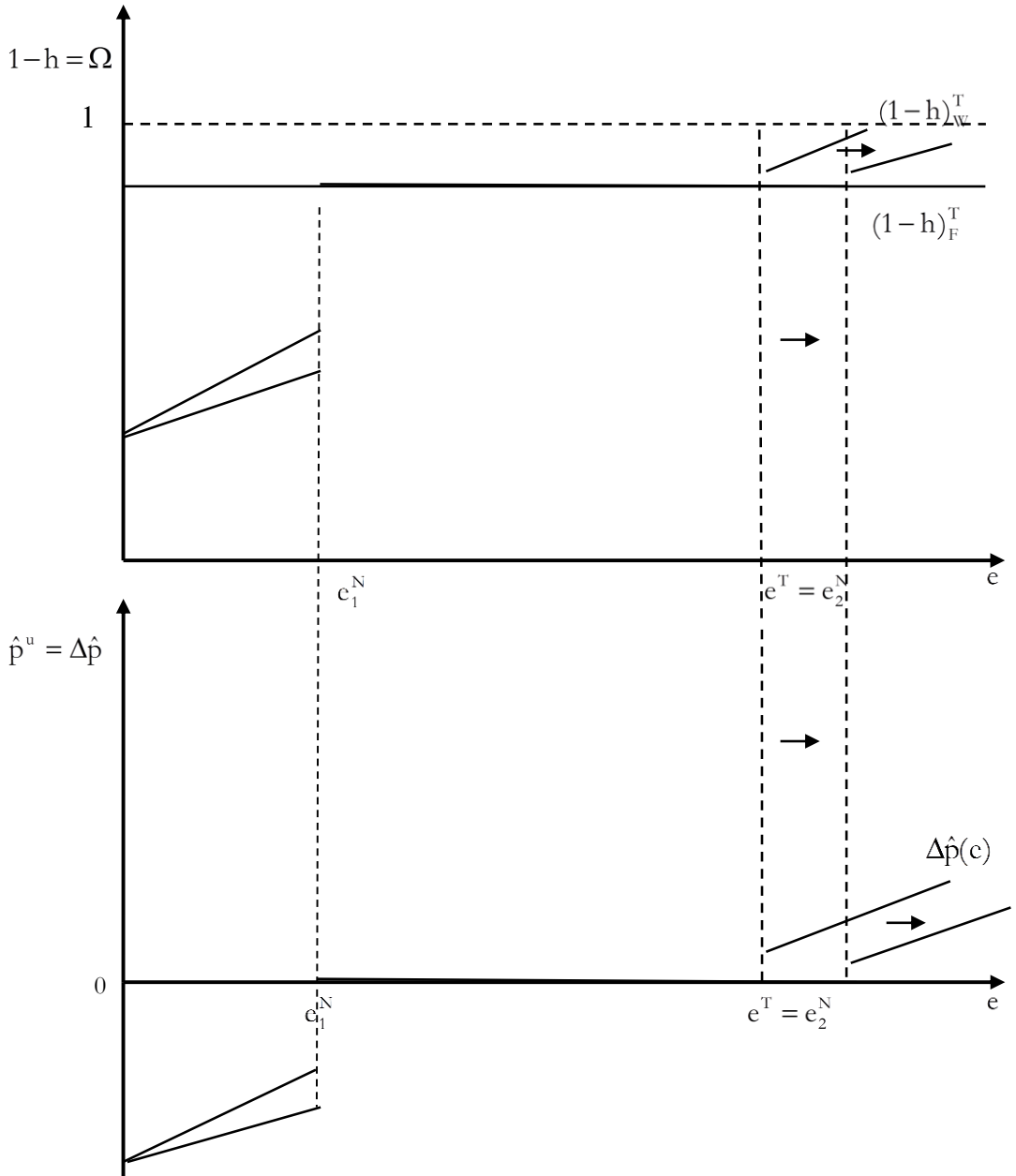
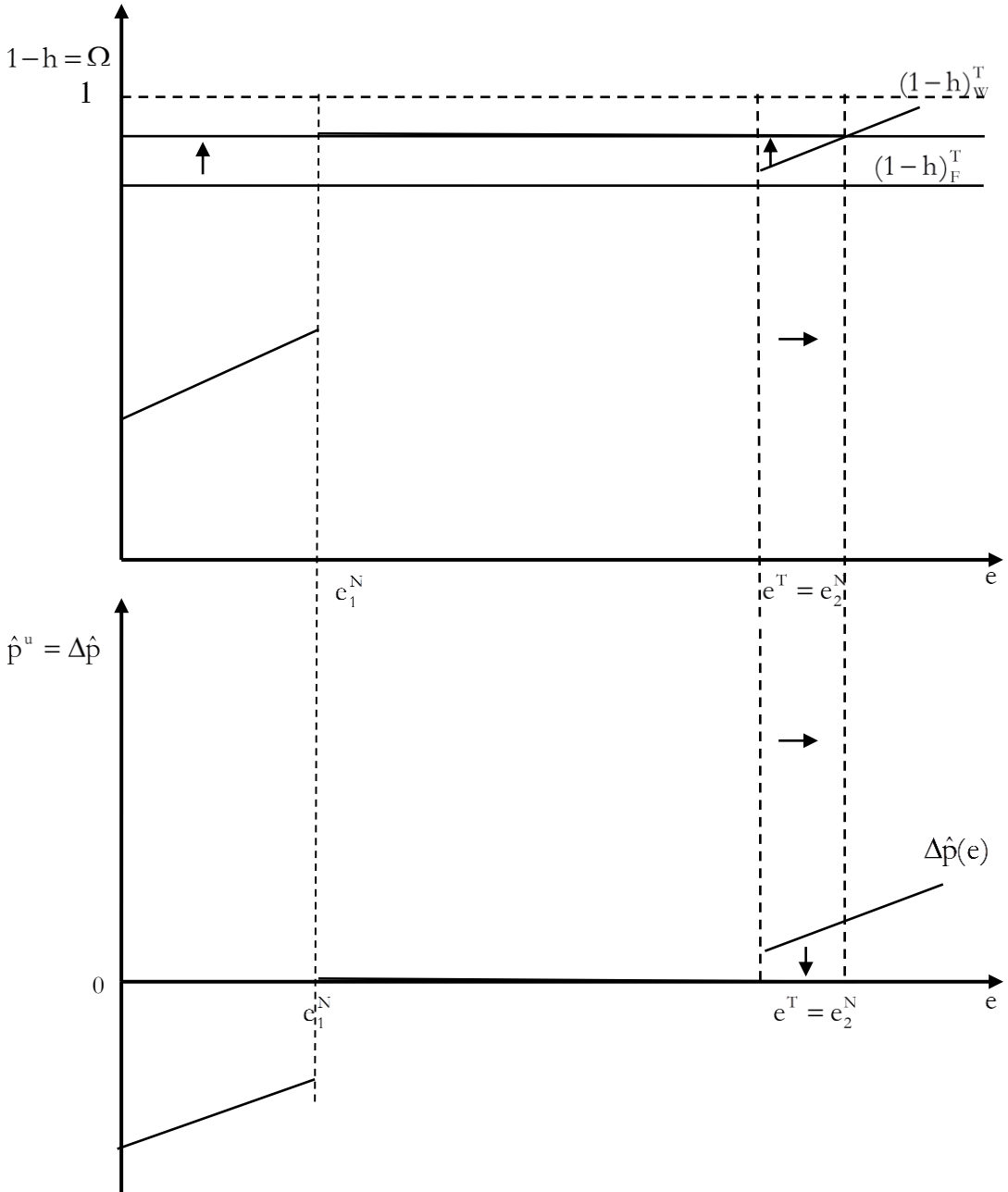


Figure 4.13: Lower interest rate and/or expansionary fiscal policies raising the SIRE through a lower mark-up and a higher target wage share of firms



Conclusions

- Integrated but teachable model – I hope …

Limits

- Closed economy with only rudimentary goverment (no taxes yet)

➢ Government taxes and open economy issues can be integrated: income generating process and inflation generating process

- No overhead labour, no procyclical labour productivity yet

➢ Introduction would make model somewhat less tractable …