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# MACROECONOMICS AFTER KALECKI AND KEYNES

Post-Keynesian Foundations

(Edward Elgar 2023)

## Chapter 5
## 'POST-KEYNESIAN MACROECONOMIC MODELS WITH CONFLICT INFLATION'

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# 5.1 INTRODUCTION

- 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

- In post-Keynesian macroeconomics, we find, basically, two ways of modelling the relationship between distributional conflict and inflation.

- Marglin (1984) and Dutt (1987), Blecker and Setterfield (2019, Chapter 5), Lavoie (2014, Chapter 8) and Setterfield (2009a): stable inflation at any level of employment and stable Phillips-curve

- Hein (2006a, 2008, Chapter 16), Stockhammer (2008), Hein and Stockhammer (2010): inflation barrier, SIRE similar to NAIRU/NCM, however:

➢ deviation from SIRE has distribution & demand effects
➢ no stable adjustment to SIRE
➢ SIRE turns endogenous to effective demand

# “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:
- closed economy, government, open economy;
- discussion of long-run endogeneity channels;

➢ complete PK macroeconomic policy-mix (Chapter 6)

Runs/periods:

- Within short-run/period: adjustment of output to demand, given stocks and expectations
- Between short periods: adjustment of inflation expectations, stocks still constant
- Medium to long-run: some endogeneity channels of SIRE with regard to effective demand, without fully considering stock adjustments

# 5.2 MODELLING CONFLICT INFLATION AND INCOME DISTRIBUTION BETWEEN CAPITAL AND LABOUR IN A CLOSED ECONOMY WITHOUT A GOVERNMENT

# Closed economy model from Chapter 4

(5.1) $$p = \left[1 + m(i)\right]\frac{w}{y}, \qquad m > 0, \frac{\partial m}{\partial i} \geq 0$$

(5.2) $$\hat{p} = (1 + \hat{m}) + \hat{w} - \hat{y}.$$

(5.3) $$\Omega = \frac{W}{pY} = \frac{w}{py} = \frac{w_r}{y} = \frac{1}{1+m},$$

(5.4) $$h = \frac{\Pi}{pY} = 1 - \Omega = 1 - \frac{w}{py} = 1 - \frac{w_r}{y} = \frac{m}{1+m}.$$

(5.5) $$\hat{\Omega} = \hat{w} - \hat{p} - \hat{y}.$$

With a constant technology in the short run and hence zero productivity growth, the wage share rises (falls) whenever wage inflation exceeds (falls short of) price inflation, which means that also the real wage rate will rise (fall)

➔ mark-up in (5.1) as firms' target mark-up, profit share in (5.4) as firms' target profit share, wage share in (5.3) as firms' target wage share.

# 5.2.1 The Blecker, Setterfield and Lavoie approach



(5.6) $$\hat{w}_t = \varphi_1\left(\Omega_W^T - \Omega_{t-1}\right) + \varphi_2\hat{p}_{t-1}, \quad \varphi_1 > 0, 1 \geq \varphi_2 \geq 0 .$$

$\Omega_W^T$ : Workers' target wage share

$\varphi_2$ : inflation indexation, has to be $\varphi_2 < 1$

(5.7) $$\hat{p}_t = \pi_1\left(\Omega_{t-1} - \Omega_F^T\right) + \pi_2\hat{w}_t, \quad \pi_1 > 0, 1 \geq \pi_2 \geq 0 .$$

$\Omega_F^T$ : firms' target wage share

Equilibrium requires:

(5.8) $$\hat{p}_t = \hat{w}_t = \hat{p}_{t-1} = \hat{w}_{t-1} .$$

(5.9) $$\hat{p}^* = \hat{w}^* = \frac{\varphi_1 \pi_1 \left(\Omega_W^T - \Omega_F^T\right)}{\varphi_1 \left(1-\pi_2\right) + \pi_1 \left(1-\varphi_2\right)},$$

(5.10) $$\Omega^* = \frac{\dfrac{\varphi_1 \Omega_W^T}{1-\varphi_2} + \dfrac{\pi_1 \Omega_F^T}{1-\pi_2}}{\dfrac{\varphi_1}{1-\varphi_2} + \dfrac{\pi_1}{1-\pi_2}}.$$

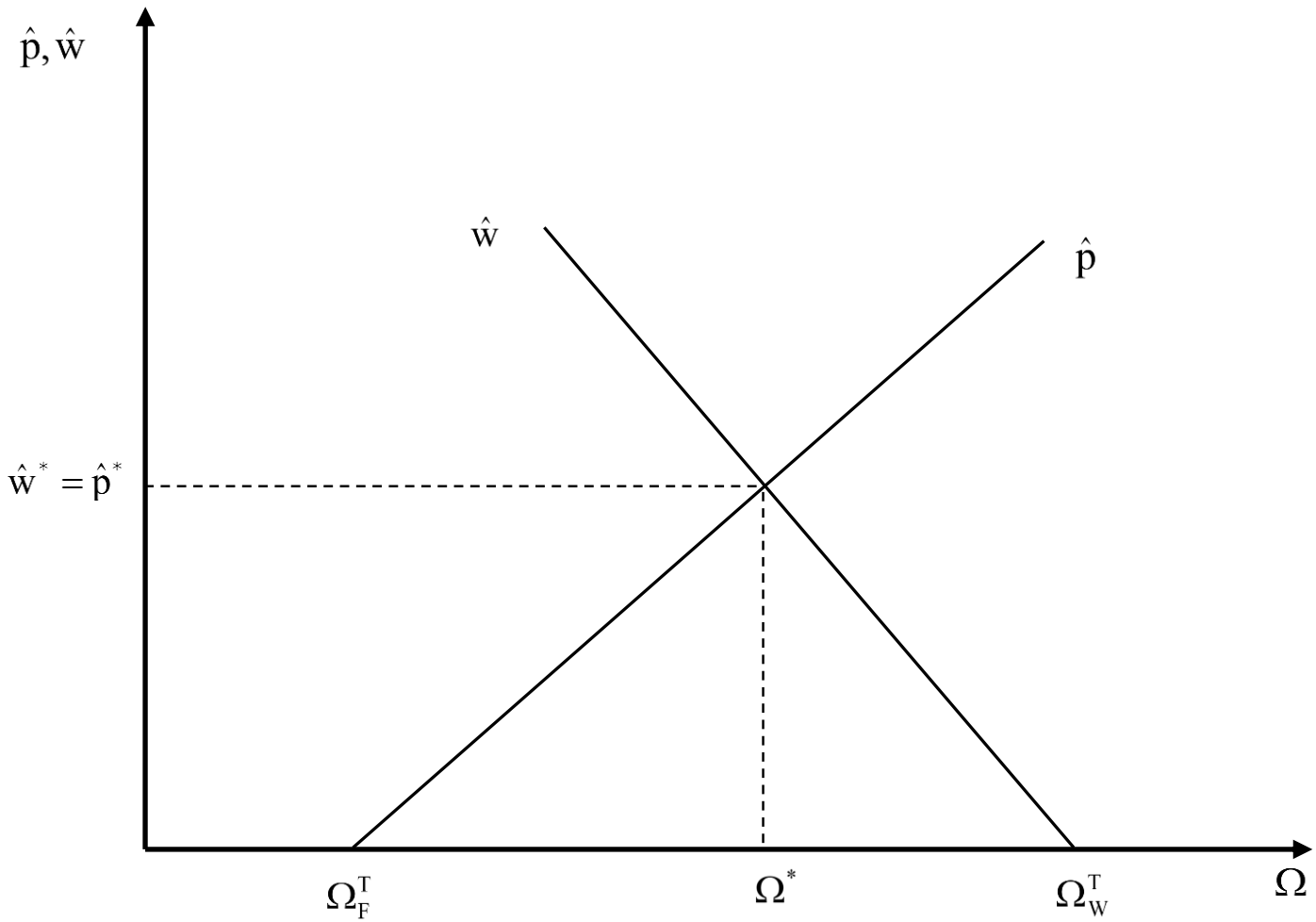
No solution if $\varphi_2 = 1$ and $\pi_2 = 1$,

In the simplified case of $\varphi_2 = 0$ and $\pi_2 = 0$:

(5.11) $$\hat{p}^* = \hat{w}^* = \frac{\varphi_1 \pi_1 \left( \Omega_W^T - \Omega_F^T \right)}{\varphi_1 + \pi_1},$$

(5.12) $$\Omega^* = \frac{\varphi_1 \Omega_W^T + \pi_1 \Omega_F^T}{\varphi_1 + \pi_1}.$$

**Figure 5.1: Conflicting claims equilibrium inflation in the Blecker, Setterfield and Lavoie approach**



A larger gap between the targets will generate a higher equilibrium inflation rate, as can easily be seen in equations (5.9) or (5.11). The same is true for stronger responses towards the deviations from targets, i.e. higher values for $\varphi_1, \pi_1$:

(5.11a) $$\frac{\partial \hat{p}^*}{\partial \varphi_1} = \frac{\pi_1^2 \left(\Omega_W^T - \Omega_F^T\right)}{\left(\varphi_1 + \pi_1\right)^2} > 0,$$

(5.11b) $$\frac{\partial \hat{p}^*}{\partial \pi_1} = \frac{\varphi_1^2 \left(\Omega_W^T - \Omega_F^T\right)}{\left(\varphi_1 + \pi_1\right)^2} > 0.$$

A stronger response of workers and trade unions towards deviations from their wage share targets will raise the equilibrium wage share, whereas as stronger response of firms towards deviations from their target will lower the equilibrium wage share:

(5.12a) $$\frac{\partial \Omega^*}{\partial \varphi_1} = \frac{\pi_1 \left( \Omega_W^T - \Omega_F^T \right)}{\left( \varphi_1 + \pi_1 \right)^2} > 0 ,$$

(5.12b) $$\frac{\partial \Omega^*}{\partial \pi_1} = \frac{-\varphi_1 \left( \Omega_W^T - \Omega_F^T \right)}{\left( \varphi_1 + \pi_1 \right)^2} < 0 .$$

Blecker and Setterfield (2019, Section 5.2.3): workers' target wage share is positively affected by the levels of economic activity and employment:

(5.13) $\Omega_W^T = 1 - h_W^T = \Omega_0 + \Omega_1 e, \qquad 1 > \Omega_0 > 0,\ \Omega_1 \geq 0\,.$

$\Omega_0, \Omega_1$ : structural features of labour market, wage bargaining, social benefits system

(5.14) $h_F^T = 1 - \Omega_F^T = h_0, \qquad 1 > h_0 > 0\,.$

$h_0$ : structural features of goods market (degree of price competition)

(5.15) $\hat{w}_t = \varphi_1\left(\Omega_0 + \Omega_1 e - \Omega_{t-1}\right) + \varphi_2 \hat{p}_{t-1}, \qquad \varphi_1 > 0, 1 \geq \varphi_2 \geq 0$,

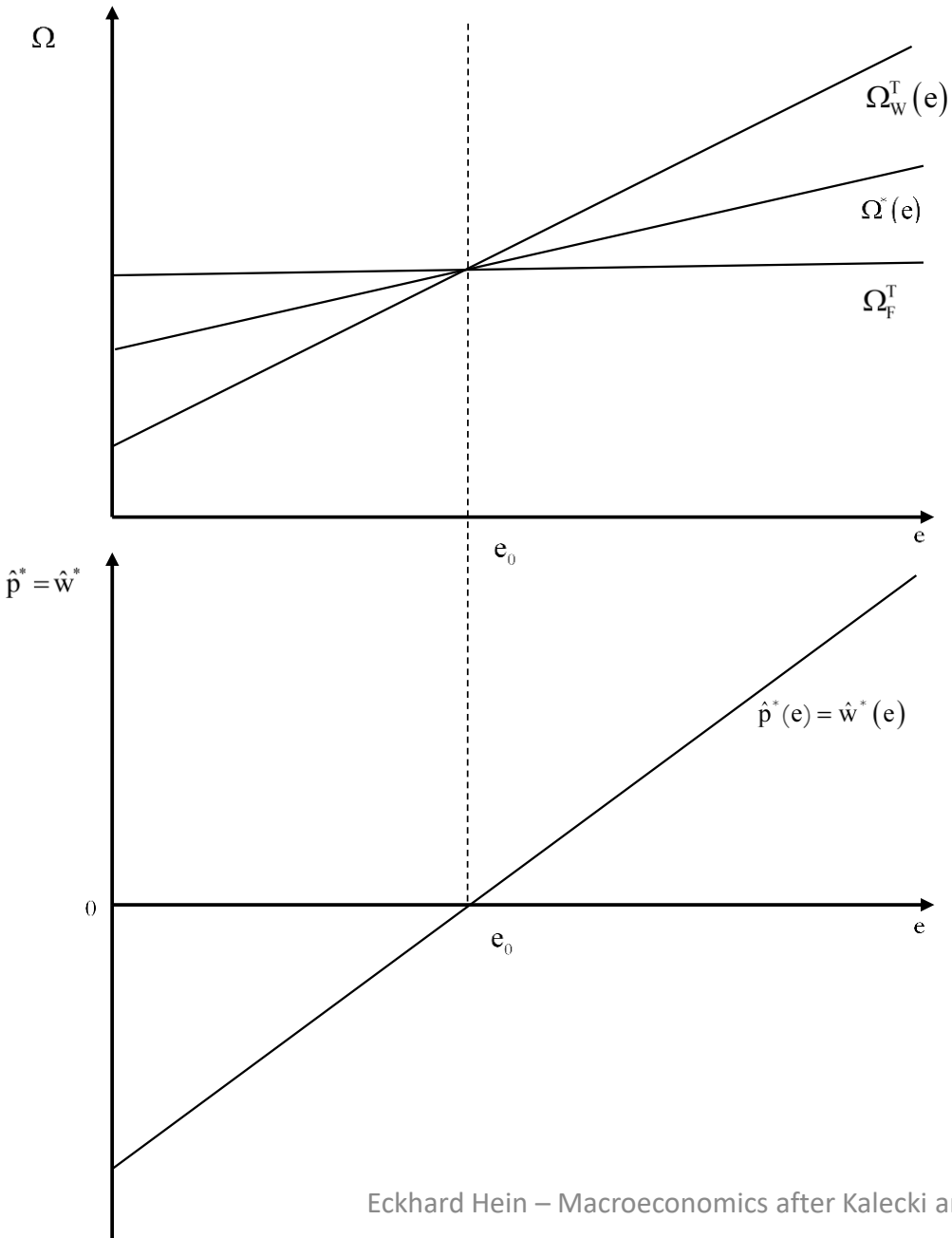
(5.16) $\hat{p}_t = \pi_1\left(\Omega_{t-1} - 1 + h_0\right) + \pi_2 \hat{w}_t, \qquad \pi_1 > 0, 1 \geq \pi_2 \geq 0$.

(5.17) $$\hat{p}^* = \hat{w}^* = \frac{\varphi_1 \pi_1\left(\Omega_0 + \Omega_1 e + h_0 - 1\right)}{\varphi_1\left(1 - \pi_2\right) + \pi_1\left(1 - \varphi_2\right)},$$

(5.18) $$\Omega^* = \frac{\frac{\varphi_1}{1-\varphi_2}\left(\Omega_0 + \Omega_1 e\right) + \frac{\pi_1}{1-\pi_2}\left(1 - h_0\right)}{\frac{\varphi_1}{1-\varphi_2} + \frac{\pi_1}{1-\pi_2}}.$$

No solution if $\varphi_2 = 1$ and $\pi_2 = 1$,

**Figure 5.2: Conflicting claims, distribution and inflation in the Blecker and Setterfield approach**



# 5.2.2 The Hein and Stockhammer approach



(5.13) $\Omega_W^T = 1 - h_W^T = \Omega_0 + \Omega_1 e, \qquad 1 > \Omega_0 > 0,\ \Omega_1 \geq 0\,.$

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

(5.14) $h_F^T = 1 - \Omega_F^T = h_0, \qquad 1 > h_0 > 0\,.$

➔ target gross profit share of firms

Income claims will be consistent if:

(5.19) $\Omega_W^T = \Omega_F^T \Rightarrow \Omega_W^T = 1 - h_F^T \Rightarrow \Omega_W^T + h_F^T = 1\,.$

or, if:

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

$e^N$: employment rate at which income claims are consistent

'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 ( $u^N = 1 - e^N$ ):

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

(5.22) $$\Omega^N = \Omega_W^T = \Omega_F^T = \Omega_0 + \Omega_1 e^N = 1 - h_0.$$

If $e > e^N$, the income claims will exceed the output to be distributed, i.e. $\Omega_W^T + h_F^T > 1$.

If $e < e^N$, income claims will fall short of the output to be distributed, i.e. $\Omega_W^T + h_F^T < 1$.

Wage inflation equation with adaptive expectations $\hat{p}_t^e = \hat{p}_{t-1}$ – and still assuming productivity growth to be zero:

(5.23) $\hat{w}_t = \omega\left(e_t - e^N\right) + \hat{p}_{t-1}, \qquad \omega \geq 0\,.$

Price inflation in the goods market:

(5.24) $\hat{p}_t = \vartheta\omega\left(e_t - e^N\right) + \hat{p}_{t-1}, \qquad 1 \geq \vartheta \geq 0\,.$

Unexpected inflation ($\hat{p}^u$): difference between inflation in the current period and the previous one:

(5.25) $\hat{p}_t^u = \hat{p}_t - \hat{p}_{t-1} = \vartheta\omega\left(e_t - e^N\right).$

Coefficient $\vartheta$ in equations (5.24) and (5.25): pass-through factor for the increase in nominal unit labour cost growth to inflation:

- Carlin/Soskice (2009, 2015): $\vartheta = 1$
- Hein/Stockhammer (2009, 2010, 2011): $\vartheta < 1$

With a deviation of employment from $e^N$ in equation (5.21) turns to:

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

(5.27) $$\hat{p}^u = \frac{h_0 + \Omega_0 + \Omega_1 e - 1}{h_2 + \Omega_2}.$$

Realised wage share

(5.28) $$\Omega = \Omega_W^T - \Omega_2\hat{p}^u = \Omega_0 + \Omega_1 e - \Omega_2\hat{p}^u, \qquad 1 > \Omega_0 > 0,\ \Omega_1, \Omega_2 \ge 0,$$

Realised profit share:

(5.29) $$h = h_F^T - h_2\hat{p}^u = h_0 - h_2\hat{p}^u, \qquad 1 > h_0 > 0,\ h_2 \ge 0.$$

Complete pass-through: $\vartheta = 1$, $h_2 = 0$ and $\Omega_2 > 0$.

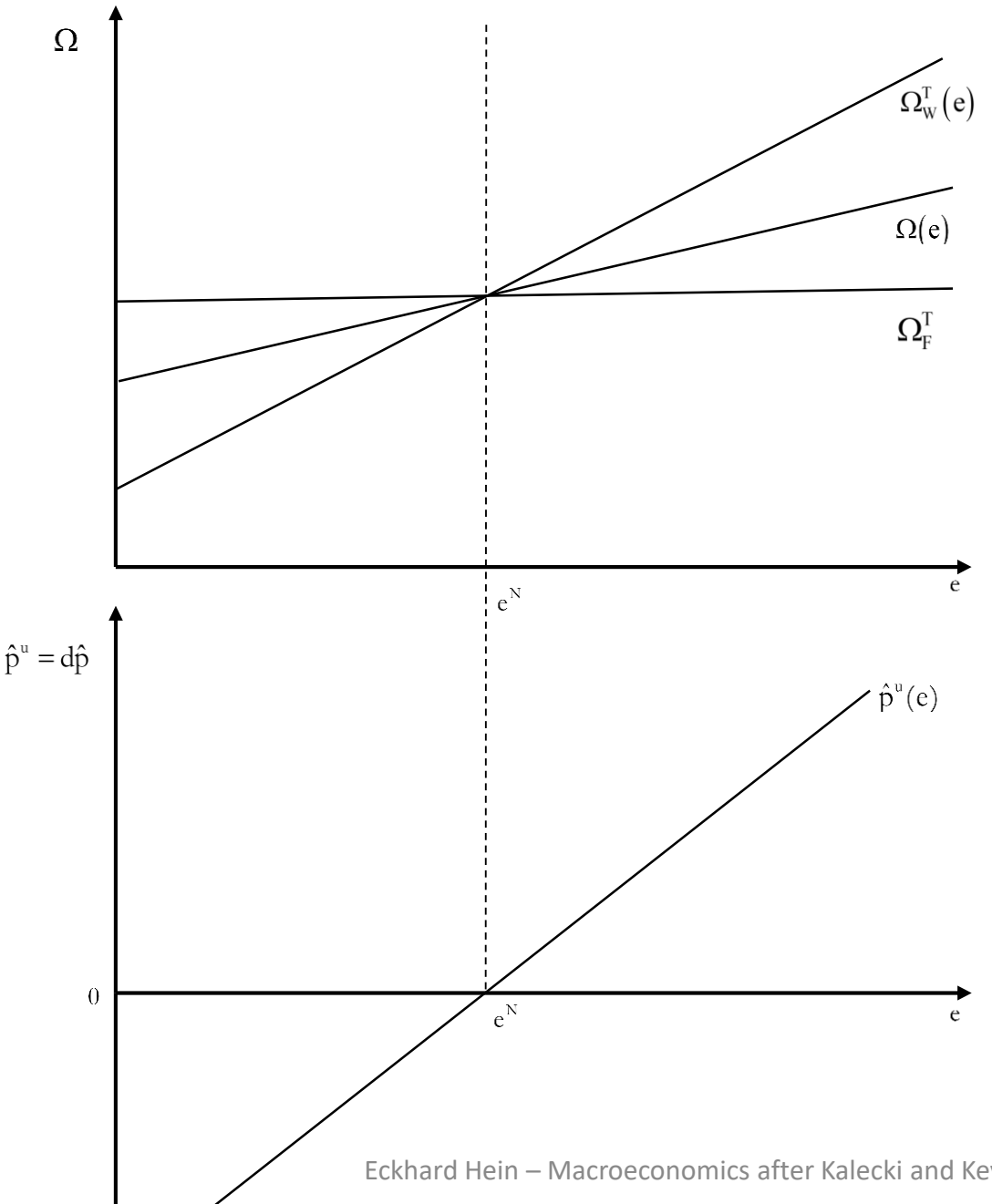
No pass-through: $\vartheta = 0$, $\Omega_2 = 0$ and $h_2 > 0$

Plugging the value for $\hat{p}_t^u$ from equation (5.27) into equations (5.28) and (5.29):

$$(5.30) \quad \Omega = \frac{(\Omega_0 + \Omega_1 e) h_2 + \Omega_2 (1 - h_0)}{h_2 + \Omega_2},$$

$$(5.31) \quad h = \frac{h_0 \Omega_2 + h_2 (1 - \Omega_0 - \Omega_1 e)}{h_2 + \Omega_2}.$$

**Figure 5.3: Conflicting claims, distribution and inflation in the Hein and Stockhammer approach**



# 5.2.3 Pro-cyclical wage share and the SIRE in the medium to long run: some notes on empirical relevance



- Pro-cyclical profit share in the course of a trade cycle in several countries (Hein 2014b, Chapter 1, Stockhammer 2017b)
- ➢ Countercyclical unit overhead labour costs (Lavoie 2009b, 2014, Chapters 5-6), in particular (Figure 4.4 in Chapter 4)
- Medium- to long-run: high and even rising rates of inflation accompanied by rising wage shares and falling profit shares in the course of the 1970s until the early 1980s, reversed in the course of the 1980s, at least until the Great Recession 2007-09 (Glyn 2006, Hein 2014b, Chapter 1, Stockhammer 2017b, Tridico 2017).
- Medium- to long-run developments are not only generated by variations of employment and unemployment rates, but also by those structural features which determine wage and profit share targets of firms and workers, as well as the means to reach these targets.

- NAIRU and SIRE in Hein and Stockhammer approach seem to be similar to NAIRU in NCM, but they are not, as will be shown:
- First, SIRE/NAIRU are no ‚strong attractors' (Sawyer 2002); second, SIRE/NAIRU are endogenous to demand determined employment.
- ‚Structural reforms' in the labour market will have distributional effects, but positive effects on employment – in the short and in the long run – are not guaranteed at all.
- Econometric studies have had severe difficulties in finding a definite NAIRU (or SIRE), which is independent of aggregate demand and actual employment (Cross 2014, Heimberger et al. 2017, Lang et al. 2020, Stanley 2004).
- Empirical studies aiming at explaining international and/or intertemporal differences in long-run unemployment trends have had similar difficulties in uniquely relating these differences to structural features of the labour market and the social benefit system.

# 5.3 UNEXPECTED INFLATION AND DISTRIBUTION BETWEEN RENTIERS AND FIRMS

Division of total profits

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

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

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

The actual or 'ex post' real interest rate:

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

Expected or 'ex ante' rentiers income

(5.35) $R^e = iB_F = \left(i_r^e + \hat{p}^e\right)B_F = i_r^e B_F + \hat{p}^e B_F = R_r^e + \hat{p}^e B_F$ .

Rentiers' 'real' ex post income:

(5.36) $R_r = \left(i - \hat{p}^e - \hat{p}^u\right)B_F = \left(i_r^e - \hat{p}^u\right)B_F = i_r B_F = R_r^e - \hat{p}^u B_F$ .

**Table 5.1: Inflation and distribution effects of deviations of the employment rate from the SIRE or of deviations of the unemployment rate from the NAIRU**

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

# 5.4 THE GOODS MARKET EQUILIBRIUM WITH DISTRIBUTION CONFLICT AND UNEXPECTED INFLATION IN A CLOSED ECONOMY WITHOUT A GOVERNMENT

Closed economy model from Section 4.3, including the effects of inflation

Saving in real terms:

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

Real investment:

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

Equilibrium at

(5.39) $I = S_r,$

Stability condition

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

From equations (5.37) – (5.39): an 'ex ante' goods market equilibrium including the target or expected values for the profit share ( $h_0$ ) and for the interest rate ( $i_r^e$ ):

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

With given labour productivity ( $y = Y/N$ ) and a given labour force ( $L$ ), the employment rate ( $e = N/L$ ) is given as:

(5.42) $$e = \frac{N}{L} = \frac{N}{Y}\frac{Y}{L} = \frac{Y}{yL} = qY ,$$

(5.43) $$e^e = \frac{q\left[I_a + (1 - s_R - \theta) i_r^e B_F\right]}{h_0 - \beta} .$$

➔ ‚ex ante' goods market equilibrium rate of employment

Deviaton of ‘ex ante’ goods market equilibrium rate of employment in equation (5.43) from SIRE in equation (5.21):

➔ 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

$$(5.44) \quad e^* = \frac{q\left[I_a + (1 - s_R - \theta)\left(i - \hat{p}^e - \hat{p}^u\right)B_F\right]}{h_0 - h_2\hat{p}^u - \beta} = \frac{q\left[I_a + (1 - s_R - \theta)i_r B_F\right]}{h - \beta}.$$

Effect of unexpected inflation:

(5.44a) $$\frac{\partial e^*}{\partial \hat{p}^u} = \frac{h_2 e^* - q\left(1 - s_R - \theta\right) B_F}{h_0 - h_2 \hat{p}^u - \beta} = \frac{q\left[h_2 Y^* - \left(1 - s_R - \theta\right) B_F\right]}{h - \beta}.$$

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 5.4: Stable inflation rate of employment ($e^N$), ex ante ($e^e$) and ex post ($e^*$) goods market equilibrium rate of employment with a strong effect of unexpected inflation on employment: upwards instability**



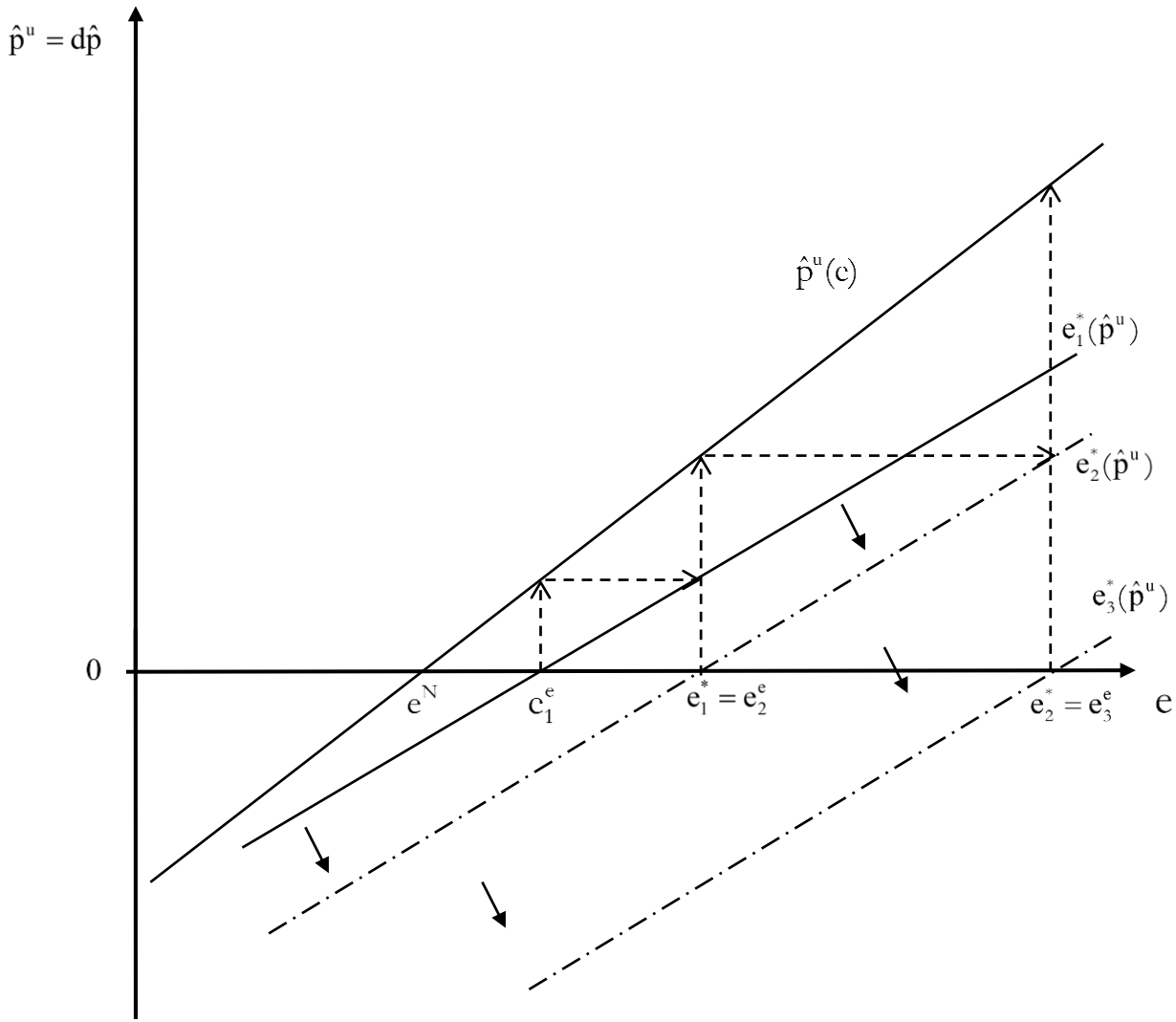


**Figure 5.5: Stable inflation rate of employment ($e^N$), ex ante ($e^e$) and ex post ($e^*$) goods market equilibrium rate of employment with a weak effect of unexpected inflation on employment: upwards instability**

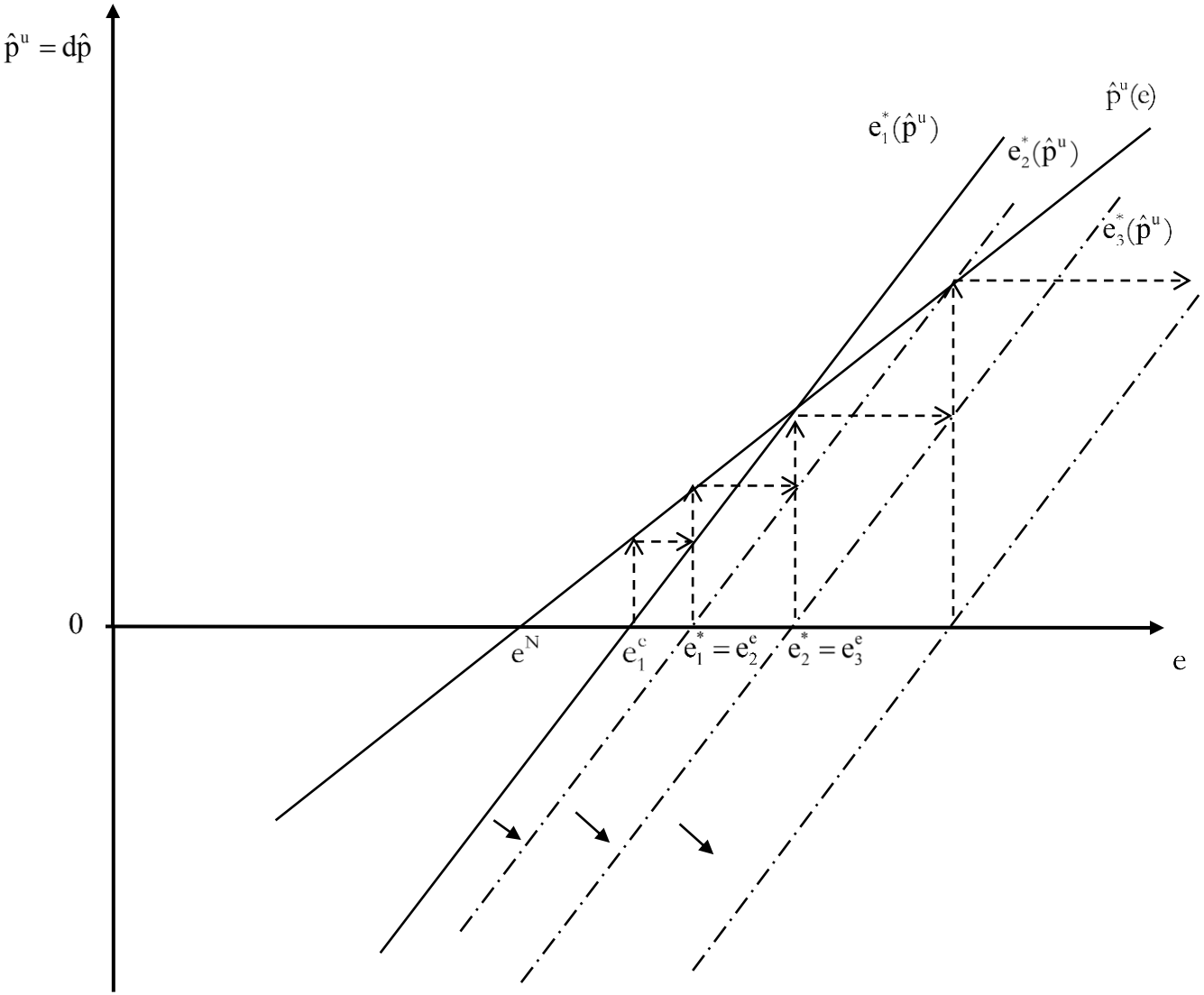
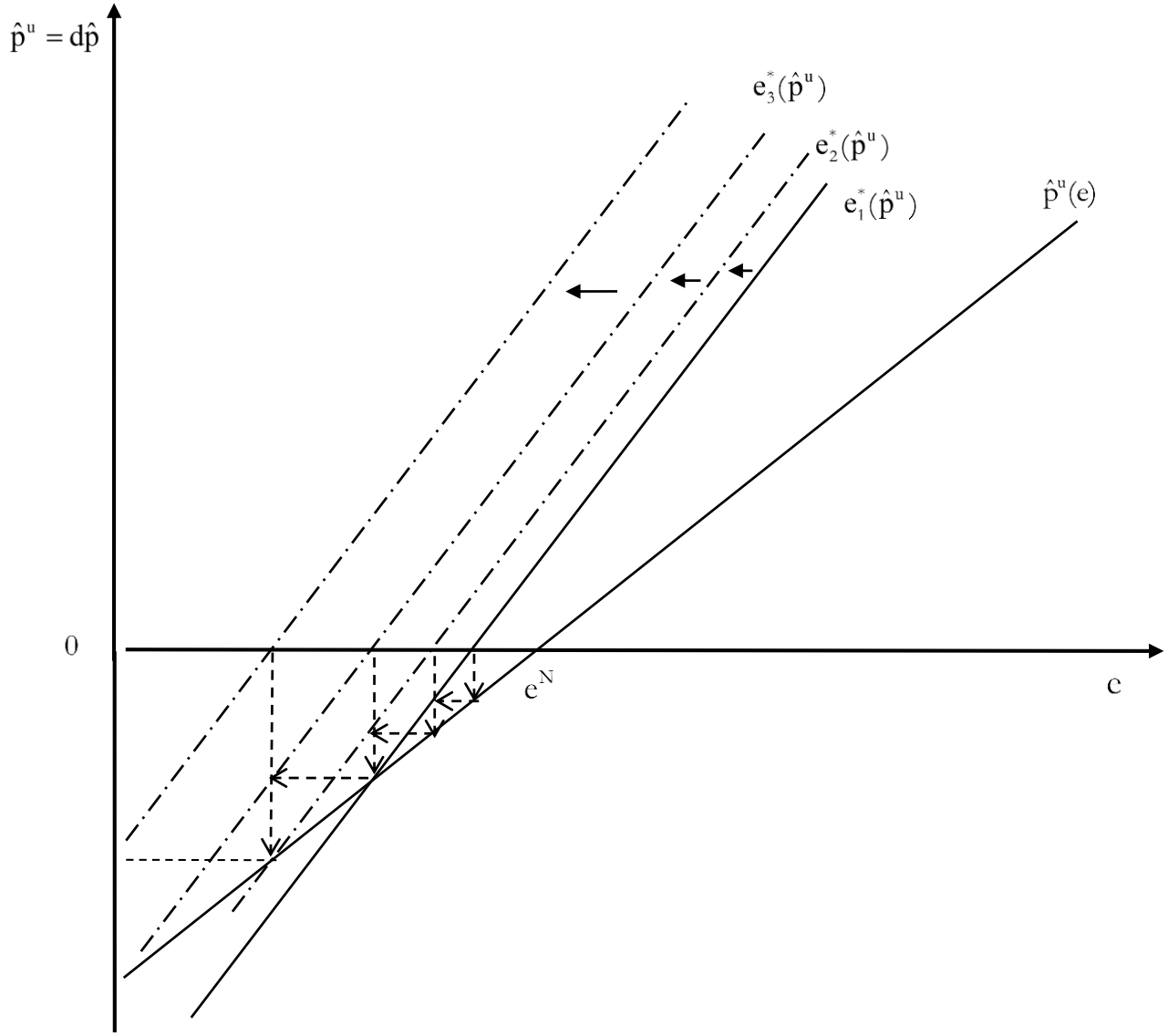


**Figure 5.6: Stable inflation rate of employment ($e^N$), ex ante ($e^e$) and ex post ($e^*$) goods market equilibrium rate of employment: downwards instability**



# 5.5 AN INFLATION-TARGETING CENTRAL BANK AS A STABILISER? SHORT- AND MEDIUM-RUN EFFECTS

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:

(5.45) $$\begin{aligned} i &= i_{r0}^e + \hat{p} + \gamma\left(\hat{p} - \hat{p}^T\right) = i_{r0}^e + \hat{p}^e + \hat{p}^u + \gamma\left(\hat{p} - \hat{p}^e\right) \\ &= i_{r0}^e + \hat{p}^e + (1+\gamma)\hat{p}^u, \quad i_{r0}^e \geq 0, \gamma > 0 \end{aligned},$$

$i_{r0}^e$ : central bank's estimation of the 'equilibrium real interest rate'

(5.44b) $$\frac{\partial e^{cb}}{\partial i} = \frac{q\left(1 - s_R - \theta\right)B_F}{h - \beta}.$$

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

**Figure 5.7: An inflation-targeting central bank monotonically stabilising the ex post goods market equilibrium rate of employment towards the SIRE**



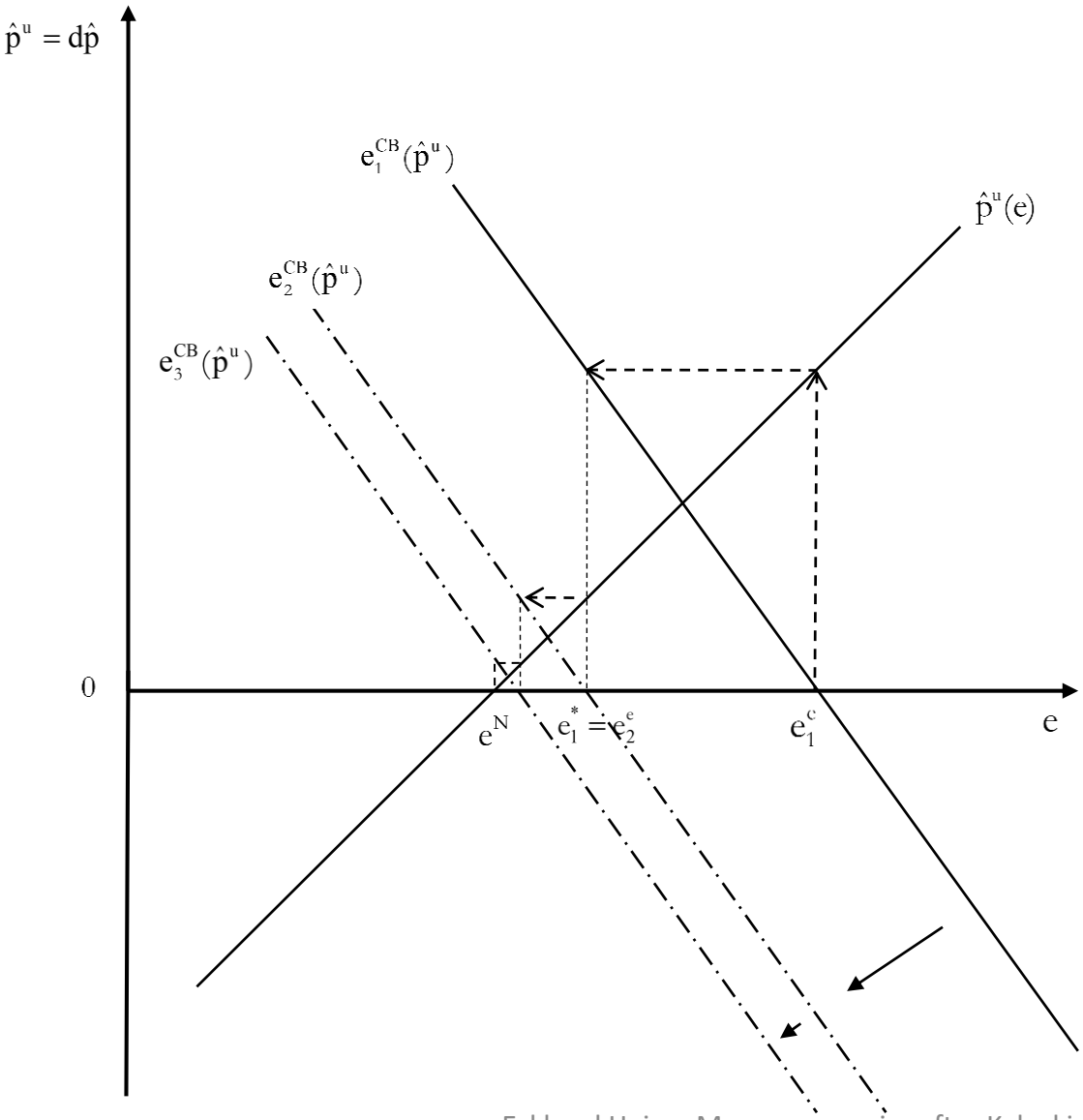


**Figure 5.8: An inflation-targeting central bank cyclically stabilising the ex post goods market equilibrium rate of employment towards the SIRE**



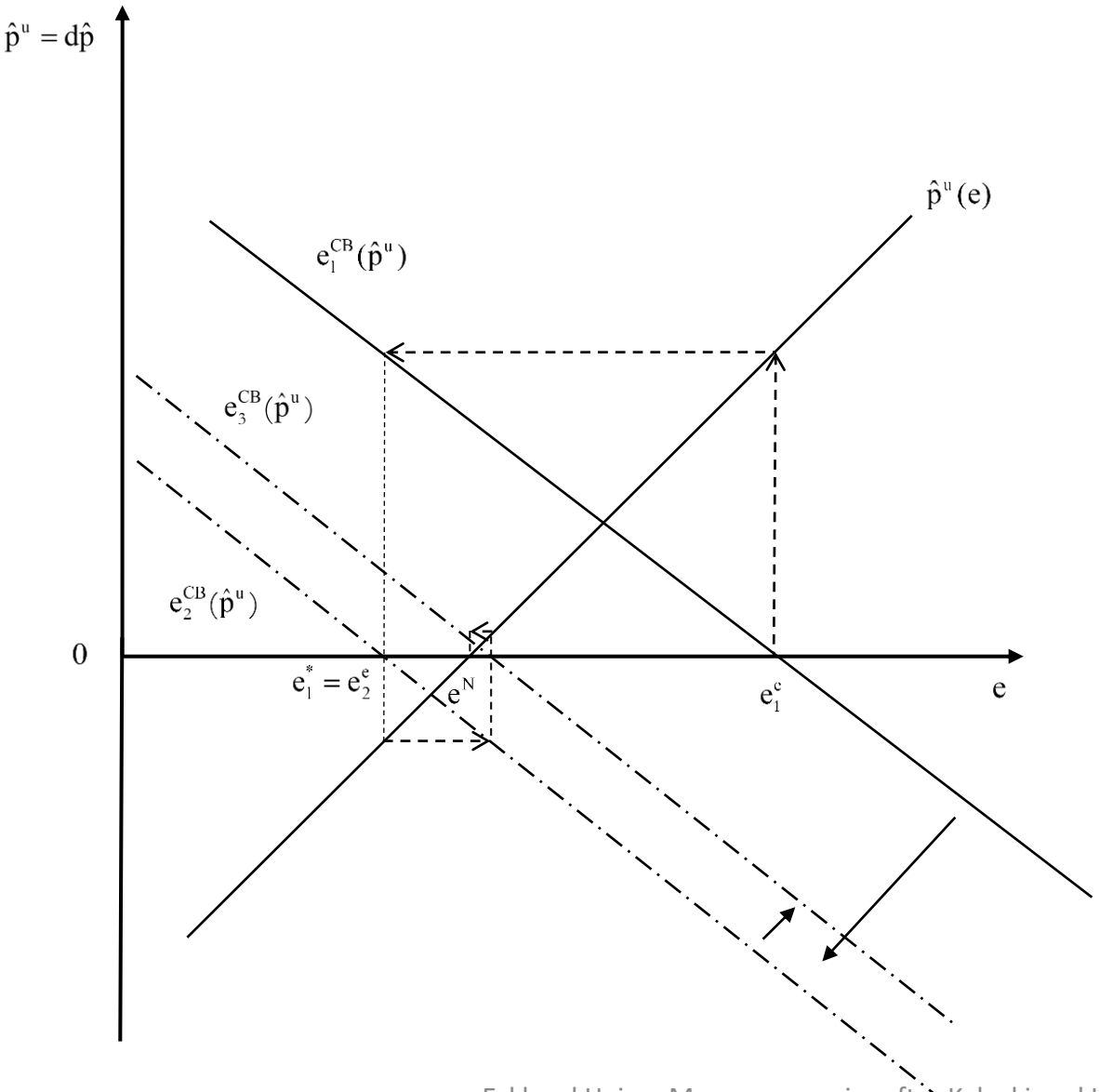
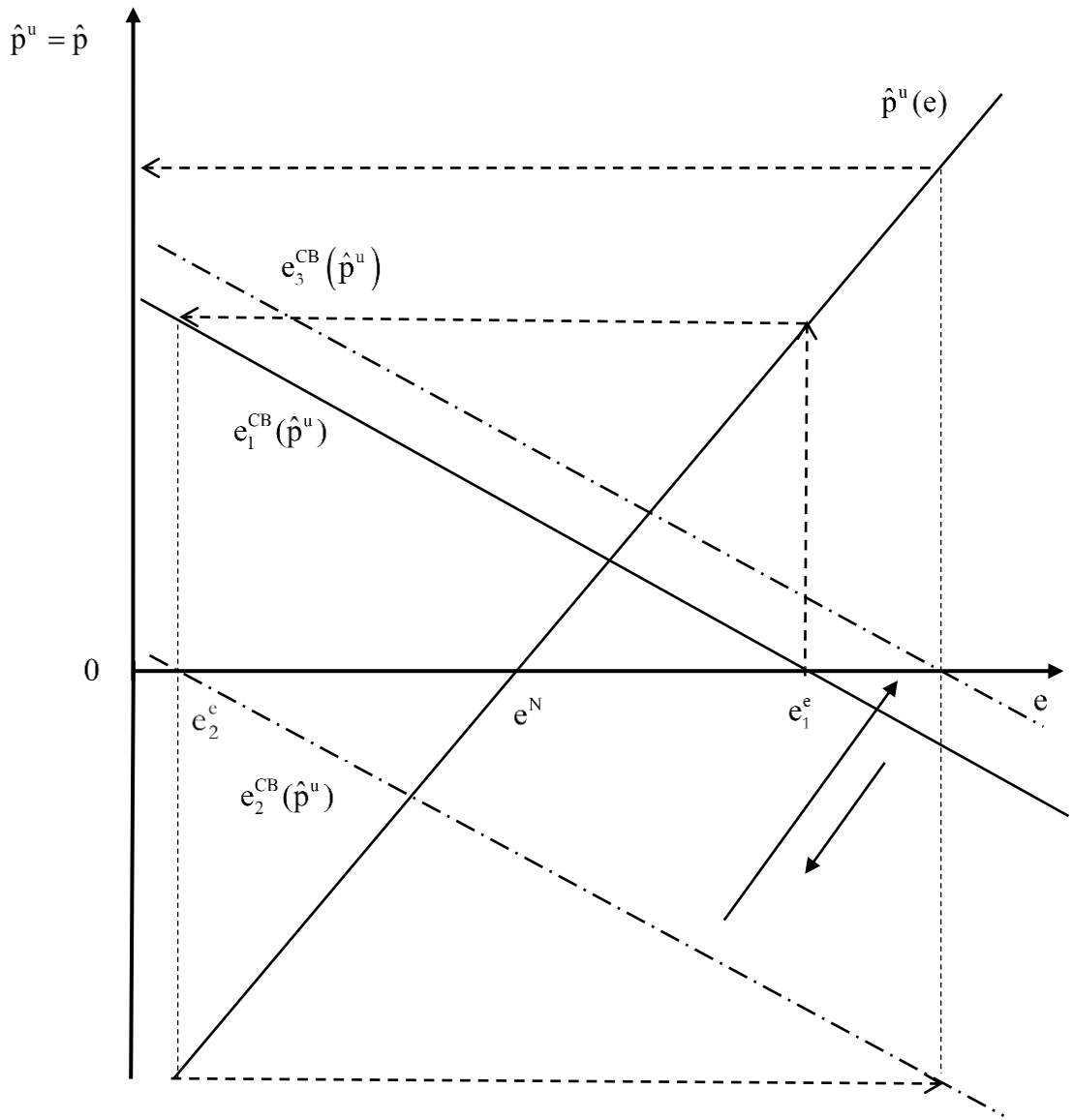


**Figure 5.9: An inflation-targeting central bank de-stabilising the ex post goods market equilibrium rate of employment**





# Short-run problems for monetary policies as a stabiliser



1. For a stable monotonic adjustment, as in Figure 5.8, 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

# Medium-run problems: 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.
- Higher target profit share also triggers changes in distribution with further feedback effects on employment and inflation

(5.46) $h_F^T = h_0 + h_3 i_r^e, \qquad h_0 > 0, h_3 \geq 0$ .

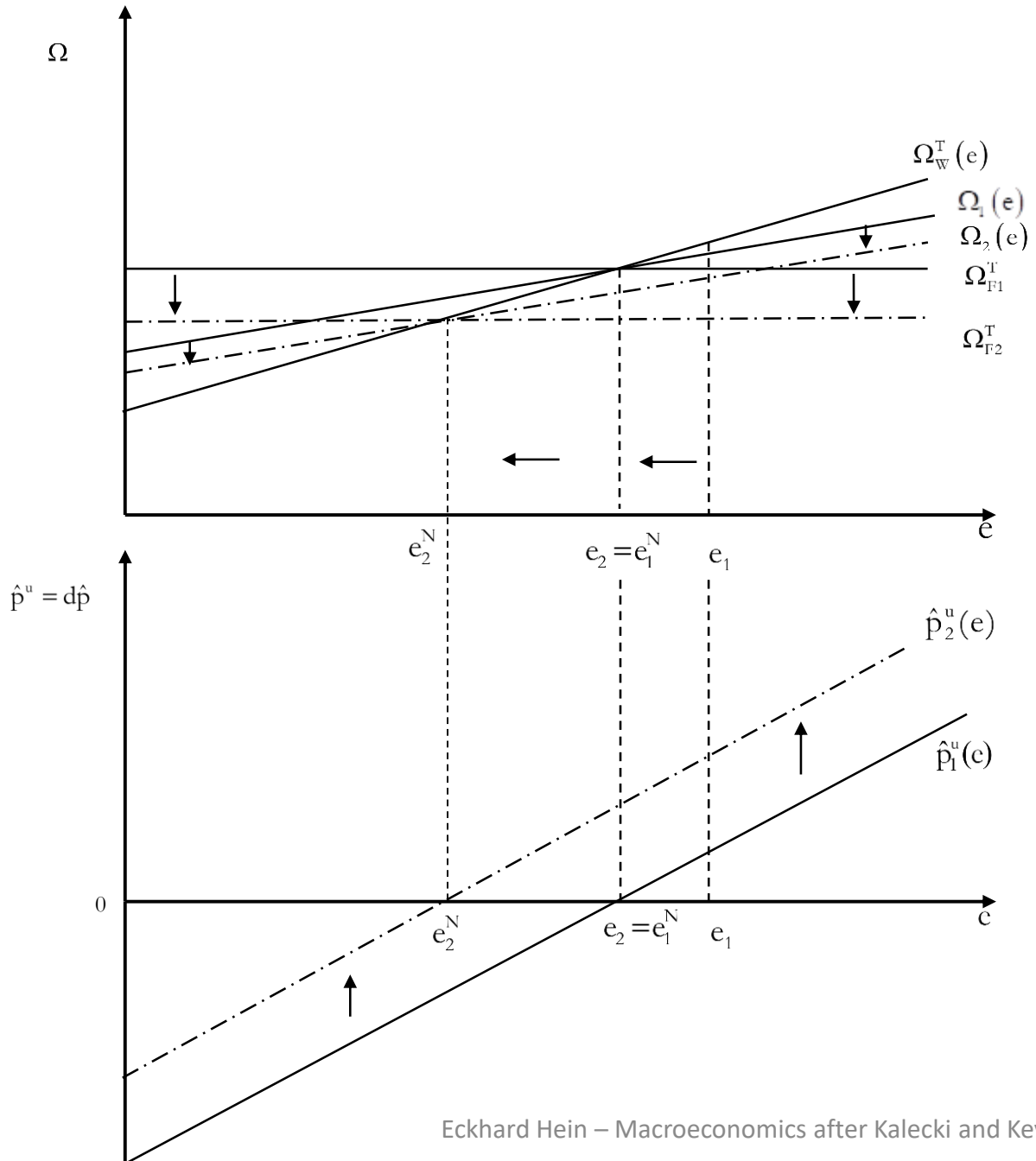
Taking into account the workers' target wage share from equation (5.13), we obtain the following stable-inflation rate of employment:

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

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

(5.47a) $$\frac{\partial e^N}{\partial i_r^e} = \frac{-h_3}{\Omega_1} < 0 .$$

**Figure 5.10: Persistent increase in the 'ex ante' real rate of interest or in the tax rate on profits and the SIRE**



With the target profit share from equation (5.46), unexpected inflation from equation (5.27) becomes:

(5.48) $$\hat{p}^u = \frac{h_0 + h_3 i_r^e + \Omega_0 + \Omega_1 e - 1}{h_2 + \Omega_2}.$$

The realised profit share from equations (5.29) turns to:

(5.49) $$h = h_F^T - h_2 \hat{p}^u = h_0 + h_3 i_r^e - h_2 \hat{p}^u, \qquad 1 > h_0 > 0,\ h_2, h_3 \geq 0.$$

Substituting unexpected inflation using equation (5.48), this becomes:

(5.50) $$h = \frac{\Omega_2 \left(h_0 + h_3 i_r^e\right) + h_2 \left(1 - \Omega_0 - \Omega_1 e\right)}{h_2 + \Omega_2},$$

(5.50a) $$\frac{\partial h}{\partial i_r^e} = \frac{\Omega_2 h_3}{h_2 + \Omega_2} > 0.$$

On top of the short-run direct effects of the increase in the interest rate in equation (5.44b), we will thus have in the medium run:

(5.44c) $$\frac{\partial e^{cb}}{\partial i_r^e} = \frac{\partial e^{cb}}{\partial h}\frac{\partial h}{\partial i_r^e} = \frac{-e^{cb}}{h-\beta}\frac{\Omega_2 h_3}{h_2+\Omega_2} = \frac{-\Omega_2 h_3 e^{cb}}{(h-\beta)(h_2+\Omega_2)} < 0 .$$

⇨ Complex medium run dynamics with endogenous and stable or unstable SIRE

# 5.6 FISCAL POLICY AS A STABILISER: TAXES AND GOVERNMENT EXPENDITURES IN THE CLOSED ECONOMY MODEL WITH CONFLICT INFLATION

- Closed economy model with a government from Section 4.4.
- Government's real expenditures on goods and services ($G_r$) are exogenous
- Government's ex post real interest payments to rentiers are given by the real interest rate and the stock of government debt at issue prices ($i_r B_G$) and are hence affected by inflation, as are real tax revenues

(5.51) $$T_r = t_\Pi \left(hY_P - i_r B_F\right) + t_\Pi \left(i_r B_F + i_r B_G\right) = t_\Pi \left(hY_P + i_r B_G\right).$$

(5.52) $$\begin{aligned} S_r &= \Pi_{Fr}^{net} + S_{Rr} = \left(1 - t_\Pi\right)\left[hY_P - i_r B_F + s_R i_r \left(B_F + B_G\right)\right] \\ &= \left(1 - t_\Pi\right)\left\{hY_P - i_r \left[\left(1 - s_R\right) B_F - s_R B_G\right]\right\},\ 1 \geq s_R > 0,\ 1 > t_\Pi \geq 0. \end{aligned}$$

(5.53) $$\begin{aligned} I &= I_a + \beta Y_P - \theta\left[i_r B_F + t_\Pi \left(hY_P - i_r B_F\right)\right] \\ &= I_a + \left(\beta - \theta t_\Pi h\right) Y_P - \theta\left(1 - t_\Pi\right) i_r B_F,\ I_a, \beta, \theta \geq 0,\ \beta - \theta t_\Pi h > 0 \end{aligned}$$

With $\beta - \theta t_\Pi h > 0$

The equilibrium condition is:

(5.54) $$I + G_r + i_r B_G = S_r + T_r ,$$

and the stability condition is given as:

(5.55) $$\frac{\partial S_r}{\partial Y_P} + \frac{\partial T_r}{\partial Y_P} > \frac{\partial I}{\partial Y_P} \Rightarrow (1 - t_\Pi) h + t_\Pi h > \beta - \theta t_\Pi h \Rightarrow (1 + \theta t_\Pi) h - \beta > 0 .$$

Ex ante equilibrium output and income from production:

(5.56) $$Y_P^e = \frac{I_a + G_r + (1 - t_\Pi) i_r^e \left[ (1 - s_R - \theta) B_F + (1 - s_R) B_G \right]}{(1 + \theta t_\Pi) h_0 - \beta}$$

For total ex ante equilibrium income::

(5.57) $$\begin{aligned} Y^e &= Y_P^e + i_r^e B_G \\ &= \frac{I_a + G_r + i_r^e \left\{ (1 - t_\Pi)(1 - s_R - \theta) B_F + \left[ (1 - t_\Pi)(1 - s_R) + (1 + \theta t_\Pi) h_0 - \beta \right] B_G \right\}}{(1 + \theta t_\Pi) h_0 - \beta} . \end{aligned}$$

Ex ante goods market equilibrium rate of employment ( $e^e$ ) implied by equation (5.56):

$$(5.58) \quad e^e = \frac{q\left\{I_a + G_r + \left(1 - t_\Pi\right) i_r^e \left[\left(1 - s_R - \theta\right) B_F + \left(1 - s_R\right) B_G\right]\right\}}{\left(1 + \theta t_\Pi\right) h_0 - \beta}$$

Ex post goods market equilibrium employment rate, including the distribution effects of unexpected inflation on the profit share and on rentiers' ex post real income:

(5.59)
$$e^* = \frac{q\left\{I_a + G_r + (1-t_\Pi)\left(i_r^e - \hat{p}^u\right)\left[(1-s_R-\theta)B_F + (1-s_R)B_G\right]\right\}}{(1+\theta t_\Pi)\left(h_0 - h_2\hat{p}^u\right) - \beta}$$
$$= \frac{q\left\{I_a + G_r + (1-t_\Pi)i_r\left[(1-s_R-\theta)B_F + (1-s_R)B_G\right]\right\}}{(1+\theta t_\Pi)h - \beta}$$

(5.59a)
$$\frac{\partial e^*}{\partial \hat{p}^u} = \frac{(1+\theta t_\Pi)h_2 e^* - q(1-t_\Pi)\left[(1-s_R-\theta)B_F + (1-s_R)B_G\right]}{(1+\theta t_\Pi)\left(h_0 - h_2\hat{p}^u\right) - \beta}$$
$$= \frac{q\left\{(1+\theta t_\Pi)h_2 Y^* - (1-t_\Pi)\left[(1-s_R-\theta)B_F + (1-s_R)B_G\right]\right\}}{(1+\theta t_\Pi)h - \beta}$$

With normal case and small effects of rentiers' real income from government interest payments, $\frac{\partial e^*}{\partial \hat{p}^u} > 0$ and SIRE will be unstable again

Government expenditures have a uniquely positive effect on the ex post equilibrium levels of output, thus also on the related employment rate taking into account fiscal policy effects ( $e^{FP}$ ), and can hence stabilise the SIRE:

(5.59b) $$\frac{\partial e^{FP}}{\partial G_r} = \frac{q}{\left(1+\theta t_{\Pi}\right)h-\beta} > 0$$

Government expenditure rule of the following type:

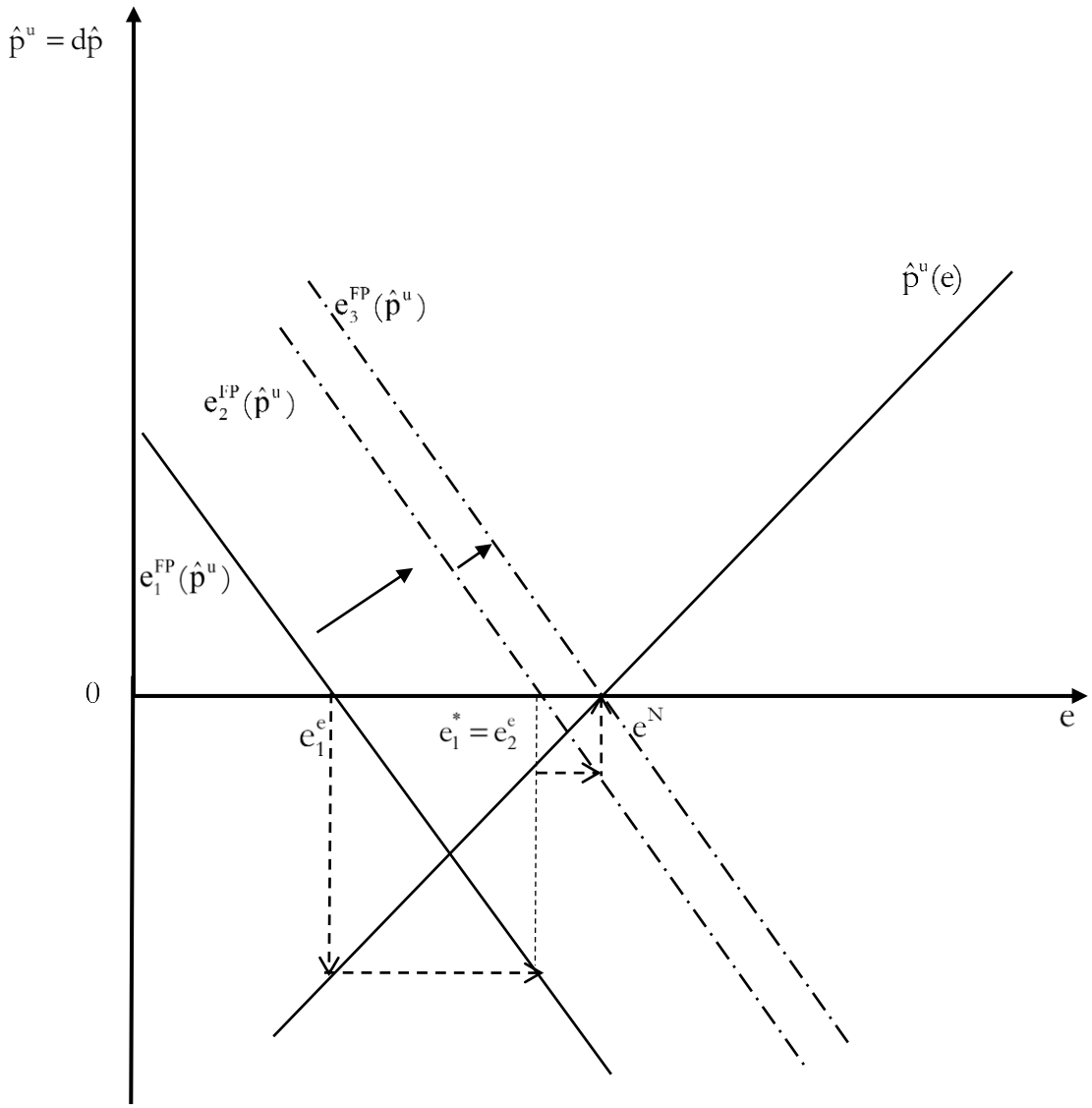
(5.60) $$G_r = G_{r0} + G_{r1}\left(e^N - e\right), \qquad G_{r0} \geq 0, G_{r1} > 0 .$$

Different from monetary policy interest rate rule, government expenditure rule

- has symmetric effects in the short run
- and no adverse effects in the long run

For given tax rate, government deficit and debt will be endogenous,
Stabilising government debt-GDP ratio without primary surpluses requires cooperation with the central bank.

**Figure 5.11: Government expenditure policies stabilising the ex post goods market equilibrium rate of employment towards the SIRE**



Using the tax rate (on profits) as a stabilising tool:

(5.59c)
$$\frac{\partial e^{FP}}{\partial t_{\Pi}} = \frac{-\theta h e^{*} - q i_r \left[ \left(1 - s_R - \theta\right) B_F + \left(1 - s_R\right) B_G \right]}{\left(1 + \theta t_{\Pi}\right) h - \beta}$$
$$= \frac{-q \left\{ \theta h Y_p^{*} + i_r \left[ \left(1 - s_R - \theta\right) B_F + \left(1 - s_R\right) B_G \right] \right\}}{\left(1 + \theta t_{\Pi}\right) h - \beta} < 0$$

With these results, we could also replace the central bank interest rate rule from equation (5.45) in order to stabilise inflation by a fiscal policy tax rule:

(5.61) $t_{\Pi} = t_{\Pi 0} + t_{\Pi 1}\left(e - e^{N}\right),\ t_{\Pi 0} \geq 0, t_{\Pi 1} > 0,$

Problems, as with interest rate policies:

- Short-run asymmetric effects
- Medium- to long-run detrimental effects

Medium- to long-run effects of changing the tax rate on profits

(5.62) $h_F^T = h_0 + h_3 i_r^e + h_4 t_\Pi, \qquad 1 > h_0 > 0,\ h_3, h_4 \geq 0$ .

Taking into account the workers' target wage share from equation (5.13):

(5.63) $$e^N = \frac{1 - \Omega_o - h_0 - h_3 i_r^e - h_4 t_\Pi}{\Omega_1}.$$

(5.63a) $$\frac{\partial e^N}{\partial t_\Pi} = \frac{-h_4}{\Omega_1} < 0$$

(5.64) $$\hat{p}^u = \frac{h_0 + h_3 i_r^e + h_4 t_\Pi + \Omega_0 + \Omega_1 e - 1}{h_2 + \Omega_2}.$$

(5.65) $$h = h_F^T - h_2 \hat{p}^u = h_0 + h_3 i_r^e + h_4 t_\Pi - h_2 \hat{p}^u, \qquad 1 > h_0 > 0,\ h_2, h_3, h_4 \geq 0.$$

Substituting unexpected inflation using equation (5.64), this becomes:

(5.66) $$h = \frac{\Omega_2 \left(h_0 + h_3 i_r^e + h_4 t_\Pi\right) + h_2 \left(1 - \Omega_0 - \Omega_1 e\right)}{h_2 + \Omega_2},$$

(5.66a) $$\frac{\partial h}{\partial t_\Pi} = \frac{\Omega_2 h_4}{h_2 + \Omega_2} > 0.$$

Second-round effects on goods market equilibrium rate of employment

(5.59d) $$\frac{\partial e^{FP}}{\partial t_{\Pi}} = \frac{\partial e^{FP}}{\partial h}\frac{\partial h}{\partial t_{\Pi}} = \frac{-\left(1+\theta t_{\Pi}\right)e^{FP}}{\left(1+\theta t_{\Pi}\right)h-\beta}\frac{\Omega_2 h_4}{h_2+\Omega_2} = \frac{-\Omega_2 h_4\left(1+\theta t_{\Pi}\right)e^{FP}}{\left[\left(1+\theta t_{\Pi}\right)h-\beta\right]\left(h_2+\Omega_2\right)} < 0 .$$

- Different types of further dynamics possible.
- SIRE is endogenous and maybe unstable.

Introducing a tax rate on wages will have similar effects

Short run:
A higher (lower) tax rate on wages will reduce (increase) workers' net income, therefore consumption out of wages for a given propensity to consume, thus it will lower (raise) aggregate demand and hence the goods market equilibrium employment rate.

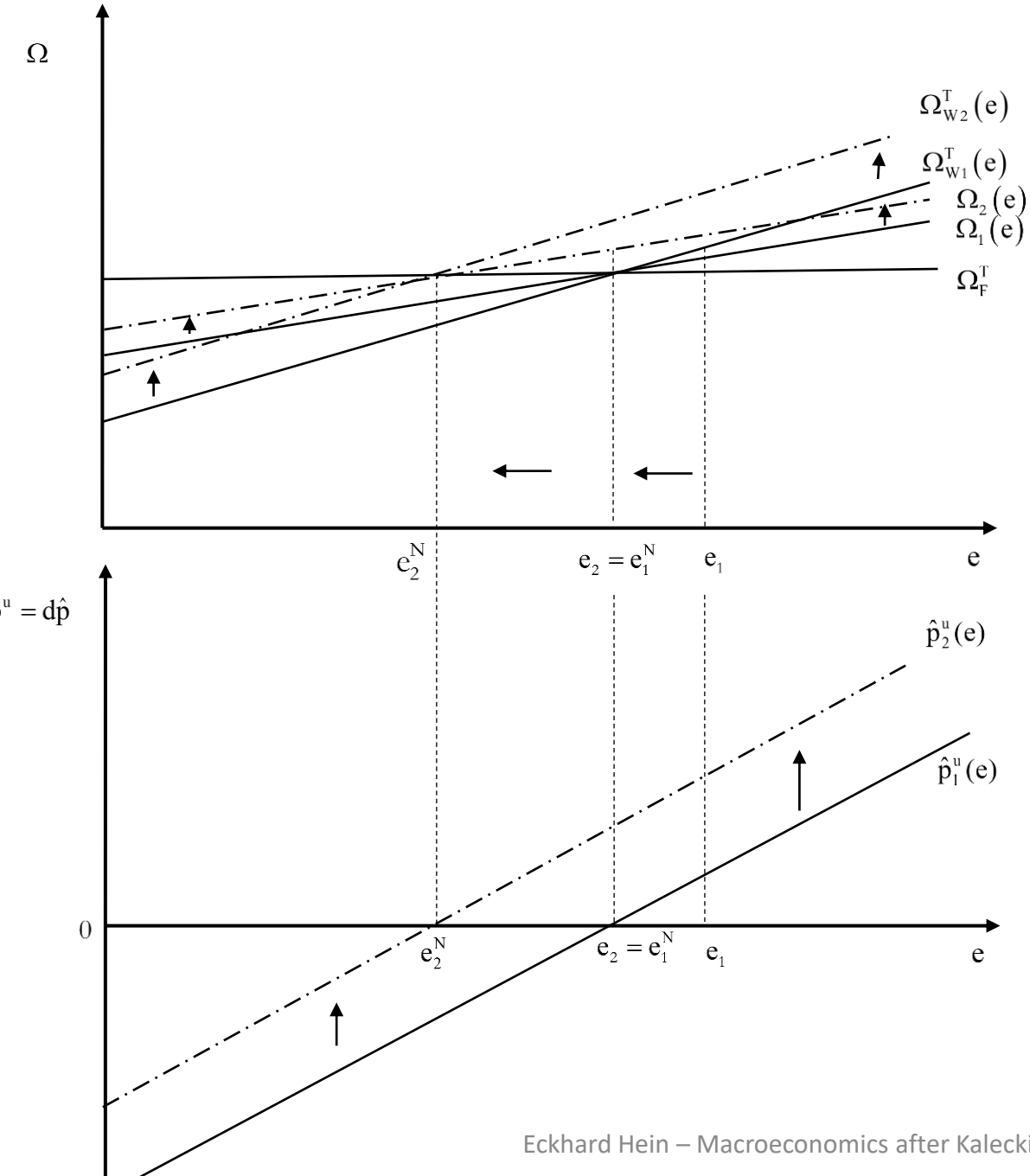
Medium-run
Higher tax rate will induce workers to raise their target wage share and the target wage share curve will shift up and the SIRE will fall.

Second round effects on aggregate demand and employment:

(5.59e) $$\frac{\partial e^{FP}}{\partial t_W} = \frac{\partial e^{FP}}{\partial h}\frac{\partial h}{\partial \Omega_W^T}\frac{\partial \Omega_W^T}{\partial t_W} > 0, \quad \frac{\partial e^{FP}}{\partial h} < 0, \frac{\partial h}{\partial \Omega_W^T} < 0, \frac{\partial \Omega_W^T}{\partial t_W} > 0 .$$

- SIRE is endogenous and maybe unstable.

**Figure 5.12: An increase in the tax rate on wages and the SIRE**



# 5.7 CONFLICT INFLATION IN THE OPEN ECONOMY MACROECONOMIC MODEL

# 5.7.1 Inflation and distribution



Open economy model from Chapter 4.5:

(5.67) $$p = \left[1 + m(i)\right]\left(\frac{w}{y} + p_f a\mu\right), \qquad m > 0, \frac{\partial m}{\partial i} \geq 0,$$

Potential sources of inflation in our open economy:

(5.68) $$\hat{p} = \xi_1\left(\hat{w} - \hat{y}\right) + \xi_2\left(\hat{p}_f + \hat{a} + \hat{\mu}\right) + \widehat{(1+m)},$$

with $\xi_1 = \frac{(1+m)w/y}{p}$, $\xi_2 = \frac{(1+m)p_f a\mu}{p}$, and hence $\xi_1 + \xi_2 = 1$.

With $\hat{y} = 0$, $\hat{\mu} = 0$, $\widehat{(1+m)} = 0$:

(5.69) $$\hat{p} = \xi_1\hat{w} + \xi_2\left(\hat{p}_f + \hat{a}\right).$$

(5.70) $$z = \frac{p_f a \mu}{\frac{w}{y}},$$

(5.71) $$h = \frac{\Pi}{pY} = \frac{\Pi}{\Pi + W} = \frac{m(1+z)}{m(1+z)+1} = \frac{1}{\frac{1}{m(1+z)}+1}.$$

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

(5.73) $$\hat{z} = \hat{p}_f + \hat{a} + \hat{\mu} - (\hat{w} - \hat{y}),$$

and with $\hat{y} = 0$ and $\hat{\mu} = 0$:

(5.74) $$\hat{z} = \hat{p}_f + \hat{a} - \hat{w}.$$

(5.74a) $\hat{z} = 0 \Rightarrow \hat{p}_f + \hat{a} = \hat{w} = \hat{p}$.

(5.74b) $\hat{z} > 0 \Rightarrow \hat{p}_f + \hat{a} > \hat{p} > \hat{w}$.

(5.74c) $\hat{z} < 0 \Rightarrow \hat{w} > \hat{p} > \hat{p}_f + \hat{a}$.

Different from the closed economy model, domestic wage inflation that exceeds given foreign inflation plus a given rate of depreciation of the domestic currency will raise the wage share even though wage inflation may be fully passed-through to price inflation, which we now assume for the sake of simplicity.

The target profit share is given by the constant mark-up in firms' price setting and the expectation of a constant medium-run $z$-ratio (adaptive expectations):

(5.75) $$a_r^e = \frac{a^e p_f^e}{p^e},$$

(5.76) $$\hat{a}_r^e = \hat{a}^e + \hat{p}_f^e - \hat{p}^e .$$

(5.77) $$h_F^T = h_0 + h_3 i_r^e + h_5 a_r^e, \qquad 1 > h_0 > 0,\ h_3, h_5 \geq 0\,.$$

(5.78) $$\Omega_W^T = 1 - h_W^T = \Omega_0 + \Omega_1 e, \qquad 1 > \Omega_0 > 0,\ \Omega_1 \geq 0\,.$$

Different from Blecker (2011) and Lavoie (2014, Chapter 8) workers' target wage share is not affected by real exchange rates, because workers only consume domestically produced goods

(5.79) $$e^N = \frac{1 - \Omega_o - h_0 - h_3 i_r^e - h_5 a_r^e}{\Omega_1}\,.$$

(5.80) $\Omega = \Omega_W^T - \Omega_2 \hat{p}^u = \Omega_0 + \Omega_1 e - \Omega_2 \hat{p}^u, \qquad 1 > \Omega_0 > 0,\ \Omega_1, \Omega_2 \geq 0,$

(5.81) $h = h_F^T - h_2 \hat{p}^u = h_0 + h_3 i_r^e + h_5 a_r^e - h_2 \hat{p}^u, \qquad 1 > h_0 > 0,\ h_2, h_3, h_5 \geq 0.$

(5.82) $$\hat{p}^u = \frac{h_0 + h_3 i_r^e + h_5 a_r^e + \Omega_0 + \Omega_1 e - 1}{h_2 + \Omega_2}.$$

Substituting unexpected inflation into equation (5.81):

(5.83) $$h = \frac{\left(h_0 + h_3 i_r^e + h_5 a_r^e\right)\Omega_2 + h_2\left(1 - \Omega_0 - \Omega_1 e\right)}{h_2 + \Omega_2},$$

(5.84) $$\Omega = \frac{\left(\Omega_0 + \Omega_1 e\right)h_2 + \Omega_2\left(1 - h_0 - h_3 i_r^e - h_5 a_r^e\right)}{h_2 + \Omega_2}.$$

- In the **short run**, a higher (lower) employment rate will raise (lower) the workers' target wage share according to equation (5.78), raise (lower) unexpected inflation in equation (5.82), raise (lower) the realised wage share according to equation (5.84), and lower (raise) the realised profit share in equation (5.83). Furthermore, a higher (lower) employment rate will also lower (raise) the real exchange rate, through the effects on domestic inflation, as can be seen in equation (5.76).

- In the **medium run**, a decline (increase) in the (expected) real exchange rate will lower (raise) the target profit share in equation (5.77), raise (lower) the SIRE in equation (5.79), it will lower (raise) unexpected inflation in equation (5.82), lower (raise) the realised profit share in equation (5.83) and raise (lower) the realised wage share in equation (5.84). A medium-run change in the expected real exchange rate will thus have similar effects as a change in the expected real interest rate

# 5.7.2 The goods market equilibrium with distribution conflict and the effects of unexpected inflation in an open economy



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

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

(5.87) $NX_r = Ex - a_r Im = \psi a_r + \chi a_r Y_f - \phi Y, \qquad \psi, \phi, \chi \geq 0$

(5.88) $I + G_r + NX_r = S_r,$

(5.89) $\frac{\partial S_r}{\partial Y} > \frac{\partial I}{\partial Y} + \frac{\partial NX_r}{\partial Y} \Rightarrow h - \beta + \phi > 0.$

Ex ante equilibrium:

$$(5.90)\quad Y^e = \frac{G_r + I_a + \left(1 - s_R - \theta\right) i_r^e B_F + a_r^e \left(\psi + \chi Y_f\right)}{h_0 + h_3 i_r^e + h_5 a_r^e - \beta + \phi}.$$

$$(5.91)\quad e^e = \frac{q\left[G_r + I_a + \left(1 - s_R - \theta\right) i_r^e B_F + a_r^e \left(\psi + \chi Y_f\right)\right]}{h_0 + h_3 i_r^e + h_5 a_r^e - \beta + \phi}.$$

Ex post equilibrium

(5.92)
$$e^* = \frac{q\left[G_r + I_a + \left(1 - s_R - \theta\right)\left(i_r^e - \hat{p}^u\right)B_F + \left(a_r^e - a_2\hat{p}^u\right)\left(\psi + \chi Y_f\right)\right]}{h_0 + h_3 i_r^e + h_5 a_r^e - h_2\hat{p}^u - \beta + \phi}$$
$$= \frac{q\left[G_r + I_a + \left(1 - s_R - \theta\right) i_r B_F + a_r\left(\psi + \chi Y_f\right)\right]}{h - \beta + \phi}$$

with the following effect of unexpected inflation:

(5.92a)
$$\frac{\partial e^*}{\partial \hat{p}^u} = \frac{h_2 e^* - q\left[\left(1 - s_R - \theta\right)B_F + a_2\left(\psi + \chi Y_f\right)\right]}{h_0 + h_3 i_r^e + h_5 a_r^e - h_2\hat{p}^u - \beta + \phi}$$
$$= \frac{q\left[h_2 Y^* - \left(1 - s_R - \theta\right)B_F - a_2\left(\psi + \chi Y_f\right)\right]}{h - \beta + \phi}$$

Three channels of influence of unexpected inflation, according to (5.92a):

- First term: a rising wage share and a falling profit share associated with unexpected inflation will raise domestic demand, which is wage-led.
  ➔ destabilising
- Second term: lower real interest payments of the firms to the rentiers caused by unexpected inflation will increase effective demand and employment, if we assume the normal case to prevail ($1-s_R-\theta<0$) and hence the real interest effect on investment to be stronger than on rentiers' consumption.
  ➔ destabilising
- Third term: unexpected inflation will make the real exchange rate and the domestic currency appreciate in real terms. On the one hand, this lowers international price competitiveness of domestic producers. On the other hand, with given foreign income and a given foreign propensity to spend on domestic exports, this will lower foreign demand for domestic goods through this income channel.
  ➔ stabilising
- Short-run unstable SIRE: $h_2Y^*-(1-s_R-\theta)B_F-a_2(\psi+\chi Y_f)>0$ (wage-led)
- Short-run stable SIRE: $h_2Y^*-(1-s_R-\theta)B_F-a_2(\psi+\chi Y_f)<0$ (profit-led)

# The case of the short-run unstable SIRE



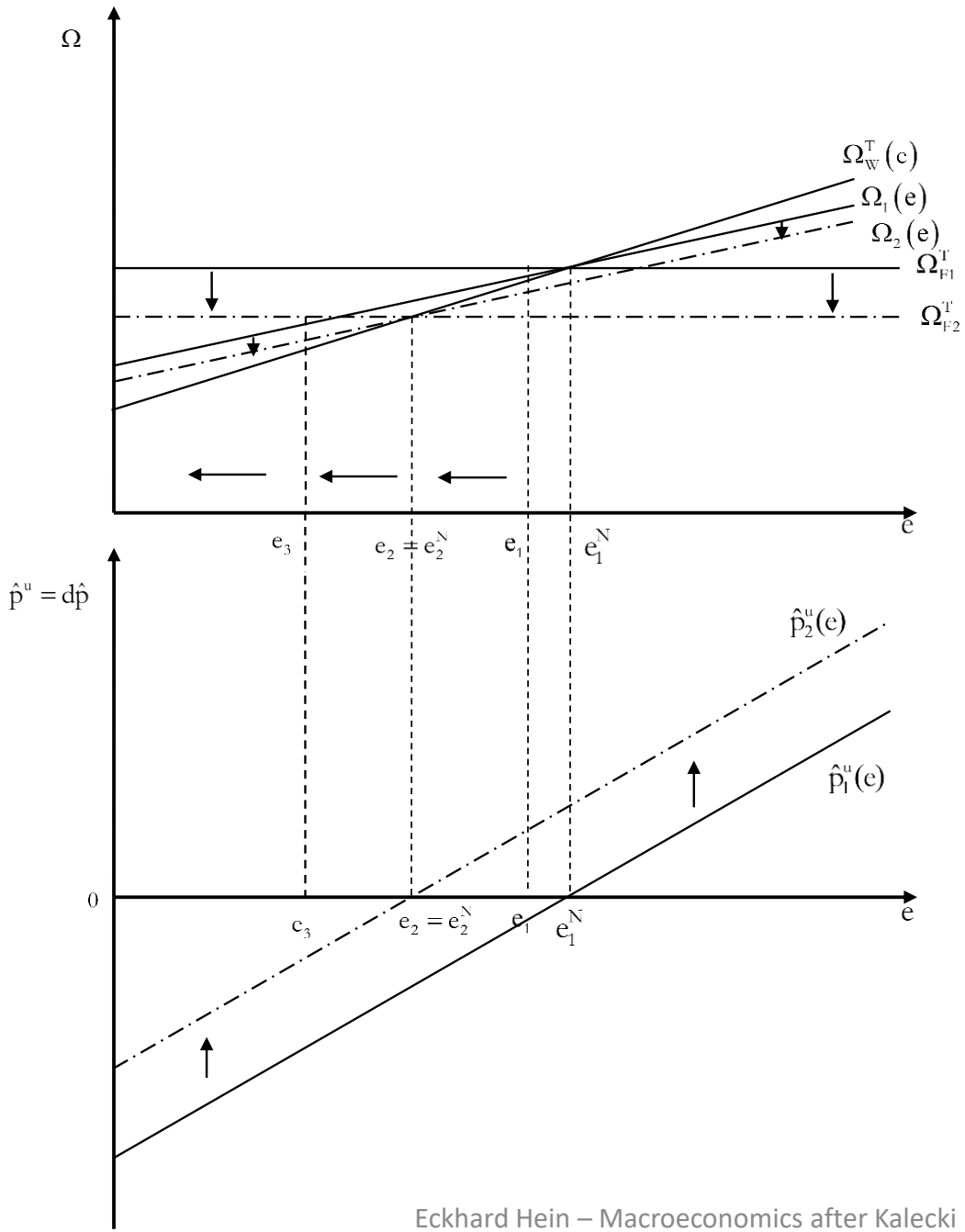
- The negative (positive) effect of positive (negative) unexpected inflation on net exports will dampen but not prevent the instability.

- In the medium run, over several periods, continuous positive (negative) unexpected inflation implies that the domestic wage and price inflation trend will exceed (fall short of) foreign inflation, which will lead to a fall (rise) in the expected real exchange rate, as well as to a fall (rise) in the ratio $z$ of unit material to unit wage costs.

- According to equation (5.81), firms' target profit share will thus decrease (increase) and, according to equation (5.83), the SIRE will rise (fall) and follow the actual employment rate

(5.79a) $$\frac{\partial e^N}{\partial a_r^e} = \frac{-h_5}{\Omega_1} < 0 .$$

**Figure 5.12: Short-run unstable and medium-run endogenous SIRE in an open economy**



- Since a falling (rising) target profit share of firms also means a falling (rising) realised profit share, according to equation (5.83), the latter will further stimulate (dampen) aggregate demand, output and employment in equation (5.92).

- The medium-run effect of a change in the expected real exchange rate on the goods market equilibrium employment rate via the change in the target and the actual profit share, taking into account equation (5.83), are given as:

- (5.92b) $$\frac{\partial e^*}{\partial a_r^e} = \frac{\partial e^*}{\partial h}\frac{\partial h}{\partial a_r^e} = \frac{-e^*}{h-\beta+\phi}\frac{h_5}{h_2+\Omega_2} = \frac{-h_5 e^*}{(h-\beta+\phi)(h_2+\Omega)} < 0 .$$

- Due to the endogeneity of the SIRE and further demand effects of medium-run changes in the target profit share, we may thus have self-reinforcing downwards (upwards) processes of both the ex post goods market equilibrium rate of employment and the SIRE.

# The case of the short-run stable SIRE

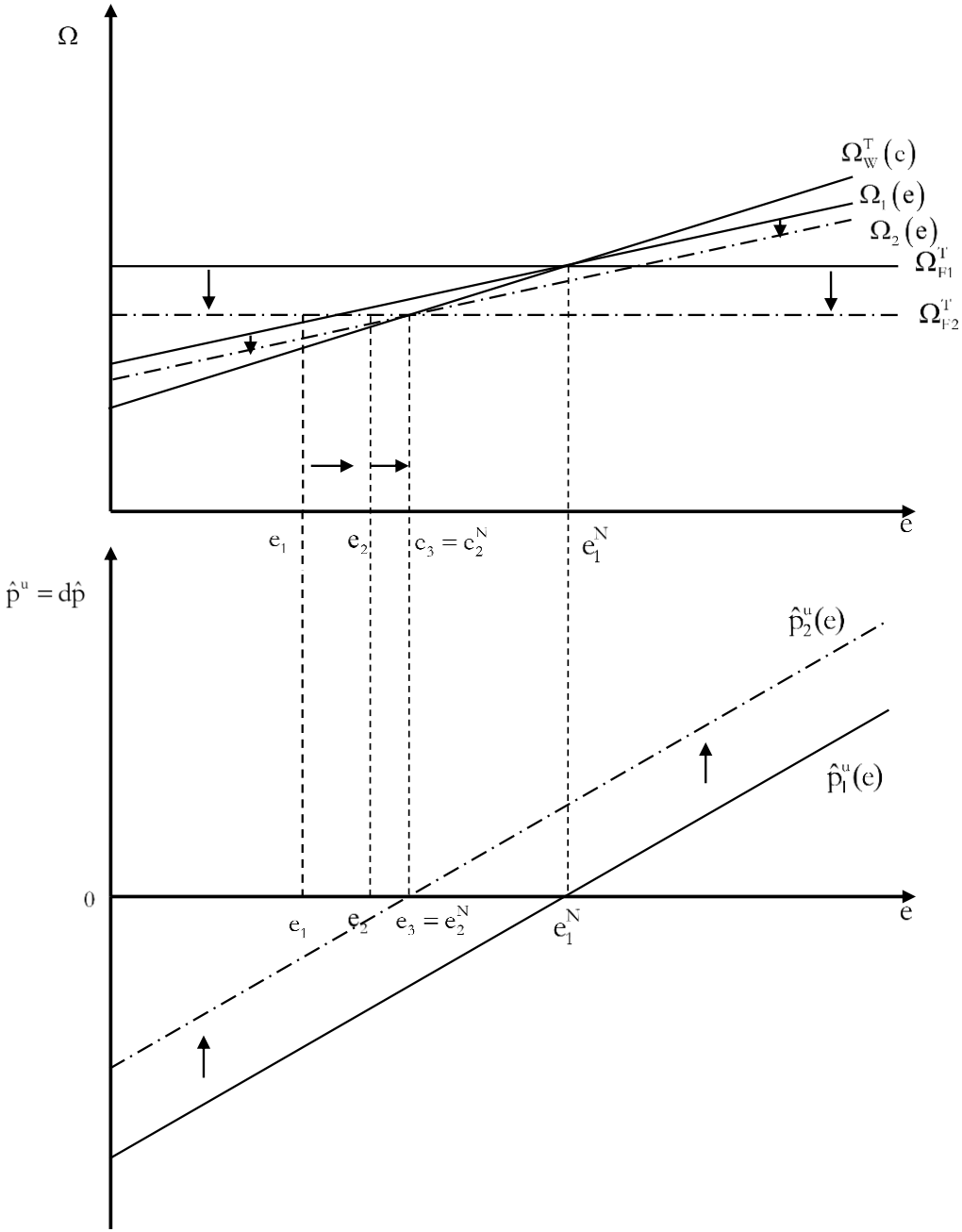


- In the short-run stable case, the negative (positive) effect of positive (negative) unexpected inflation on net exports will dominate over the redistributive effects on domestic demand, prevent cumulative instability and move the employment rate back towards the SIRE.

- However, unless this effect leads to an immediate return of the employment rate towards the SIRE, medium-run positive (negative) unexpected inflation effects on the expected real exchange rate also have to be considered in this case.

- These cause a change in the target profit share in equation (5.77), the SIRE in equation (5.79), the realised profit share in equation (5.83), with a second-round effect on the employment rate in equation (5.92). A potential scenario is shown in Figure 5.13.

**Figure 5.13: Short-run stable and medium-run endogenous SIRE in an open economy**



- Also in the open economy, different from NCM, the SIRE is far from being a strong attractor in the short run, in particular if aggregate demand remains wage-led.

- Even without adjustments of the nominal exchange rate, real exchange rate dynamics associated with unexpected (dis-)inflation feeds back on the SIRE in the medium run and make it endogenous.

- It cannot be expected to reach a high SIRE (or a low NAIRU) without macroeconomic economic policy interventions and aggregate demand management. For these, government expenditure policies seem to be the appropriate tool, also in the open economy.

# 5.8 FURTHER MEDIUM- TO LONG-RUN ENDOGENEITY CHANNELS FOR THE SIRE AND THE NAIRU

1. Insider bargaining or deskilling of the unemployed may dampen the wage effects of unemployment (Ball 1999, 2014, Blanchard and Summers 1987, 1988, Stockhammer and Sturn (2012);

2. Conventional wage norms may endogenise the wage targets of workers (Setterfield and Lovejoy 2006, Skott 2005, Stockhammer 2008);

3. 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);

# 5.8.1 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

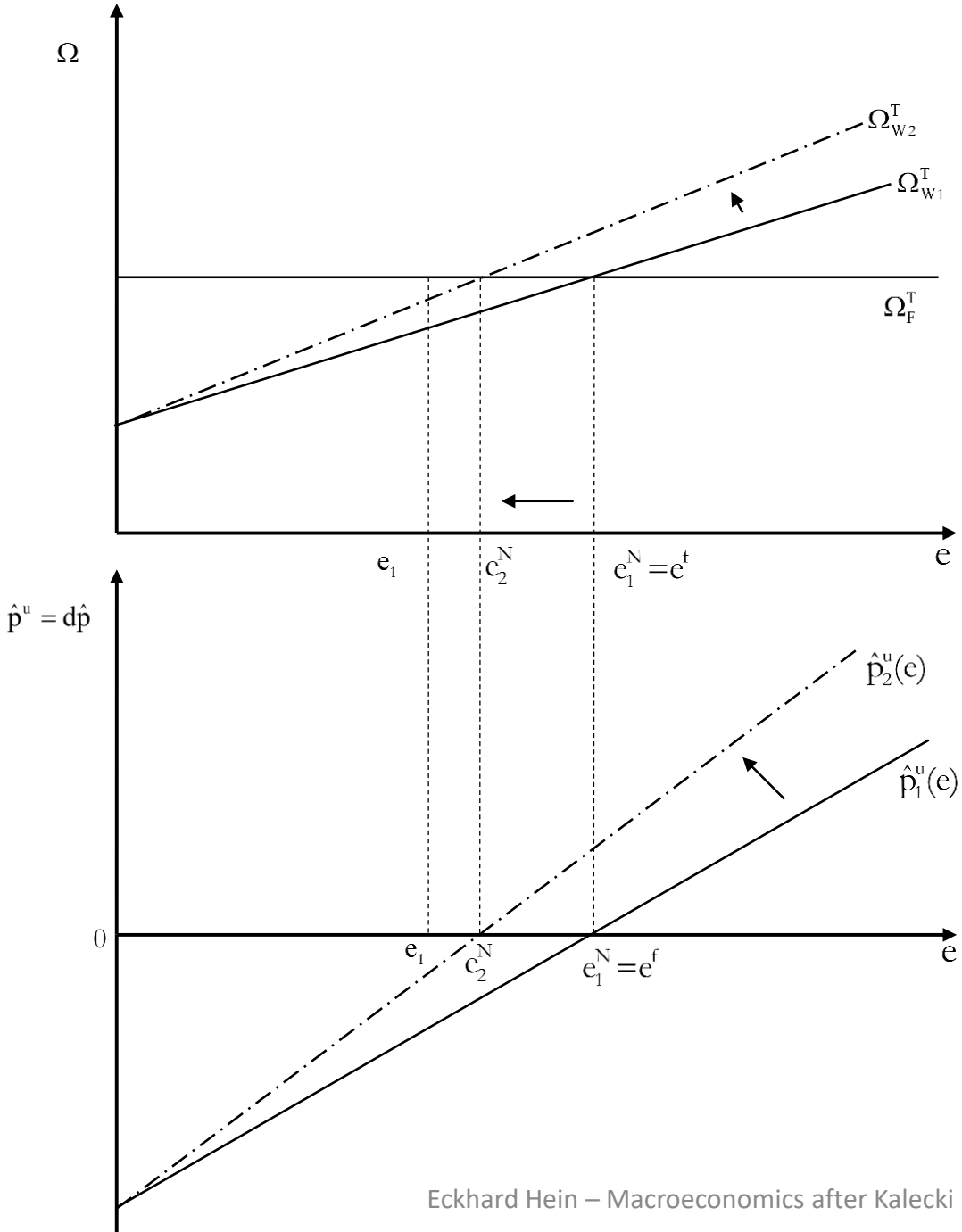
(5.93) $$\Omega_W^T = \Omega_0 + \Omega_1 \left[ e + \Omega_3 \left( e^f - e \right) \right], \qquad 1 > \Omega_0 > 0, \Omega_1, \Omega_3 \geq 0 \,.$$

Combining equation (5.93) with firms' target profit share from equation (5.14) we get for the SIRE:

(5.94) $$e^N = \frac{1 - \Omega_0 - \Omega_1 \Omega_3 \left( e^f - e \right) - h_0}{\Omega_1} \,.$$

(5.94a) $$\frac{\partial e^N}{\partial \left( e^f - e \right)} = -\Omega_3 < 0 \,.$$

**Figure 5.15: Labour market persistence mechanisms and the SIRE**



# 5.8.2 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

(5.95) $$\Omega_W^T = \Omega_0 + \Omega_1 e + \Omega_4 \left(\Omega - \Omega_W^T\right) = \frac{\Omega_0 + \Omega_1 e + \Omega_4 \Omega}{1 + \Omega_3}, \quad .$$

$$1 > \Omega_0 > 0, \Omega_1, \Omega_4 \geq 0$$

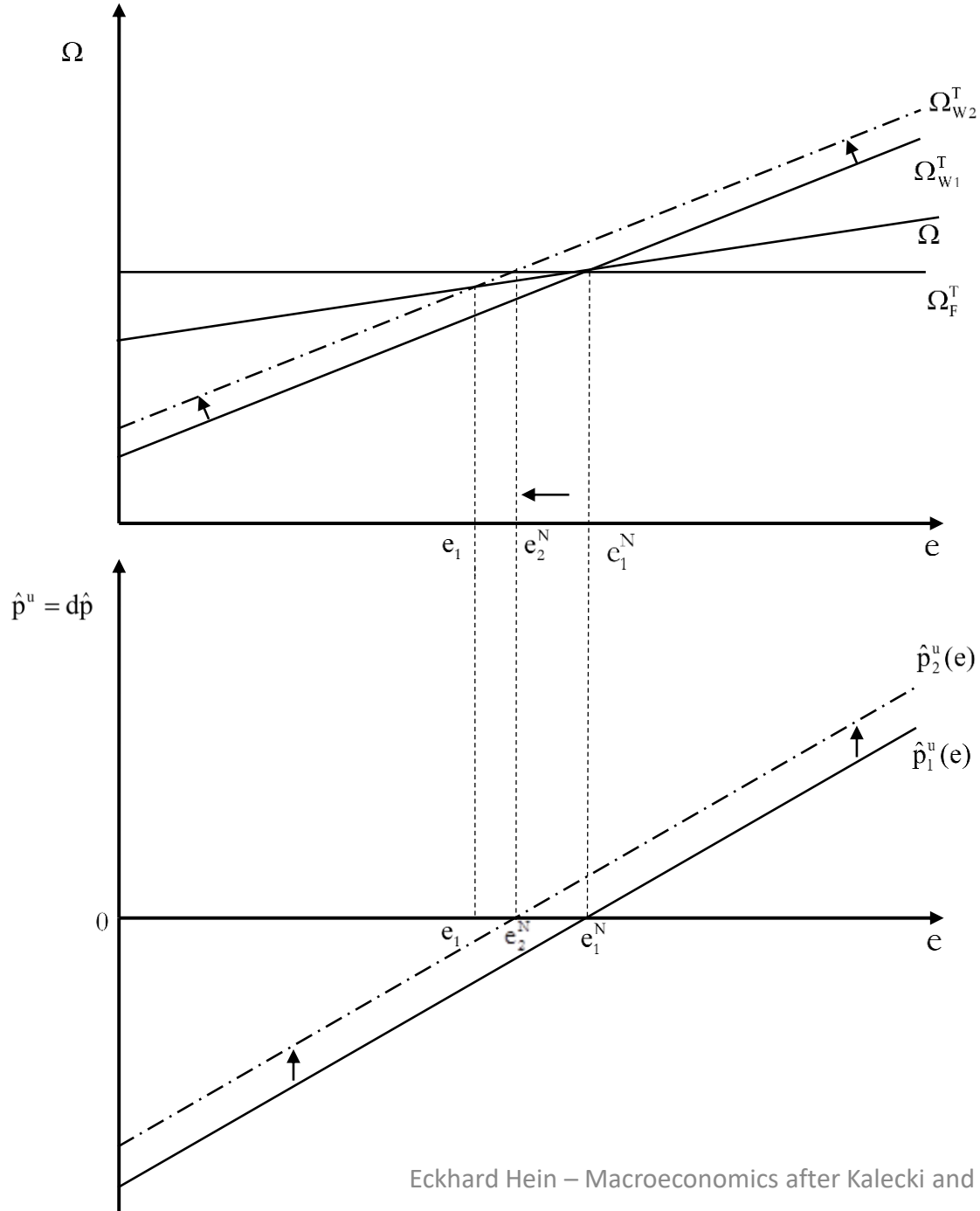
Combining equation (5.95) with the firms' target profit share from equation (5.14), the SIRE becomes:

(5.96) $$e^N = \frac{\left(1 - h_0\right)\left(1 + \Omega_3\right) - \Omega_0 - \Omega_4 \Omega}{\Omega_1}.$$

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

(5.96a) $$\frac{\partial e^N}{\partial \Omega} = -\frac{\Omega_4}{\Omega_1} < 0.$$

**Figure 5.16: Endogenous wage aspirations and the SIRE**



# 5.8.3 The effect of investment in the 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 (u), 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.

(5.97) $h_F^T = h_0 + h_1 u, \;\; h_0 > 0, h_1 \geq 0$.

With u = Y/K

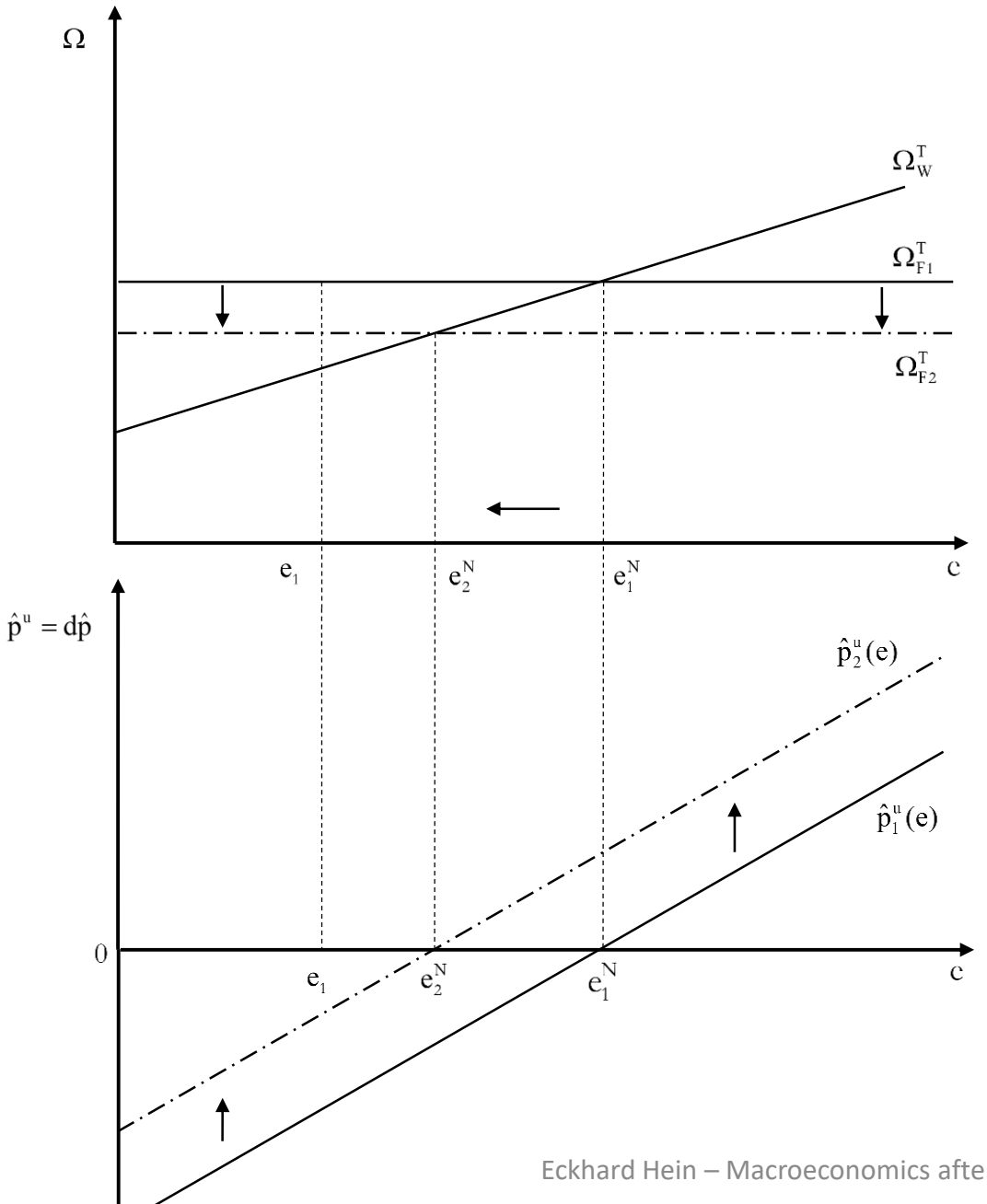
Taking into workers' target wage share from equation (5.13), we get for the SIRE:

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

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:

(5.98a) $$\frac{\partial e^N}{\partial u} = -\frac{h_1}{\Omega_1} < 0.$$

**Figure 5.17: Low investment in the short run, higher capacity utilisation in the long run and the SIRE**



# APPENDIX 5.I:
# A PRO-CYCLICAL PROFIT SHARE IN THE HEIN AND STOCKHAMMER MODEL

In order to generate a pro-cyclical profit share, we take workers' target wage share from equation (5.13):

(5.13) $\Omega_W^T = 1 - h_W^T = \Omega_0 + \Omega_1 e, \qquad 1 > \Omega_0 > 0,\ \Omega_1 \geq 0\,,$

and we modify firms' target profit share from equation (5.14) such that it also depends positively on the employment rate:

(5.14A) $h_F^T = 1 - \Omega_F^T = h_0 + h_1 e, \qquad 1 > h_0 > 0,\ h_1 \geq 0\,.$

The SIRE then turns to:

(5.21A) $e^N = \dfrac{1 - h_0 - \Omega_0}{h_1 + \Omega_1}\,,$

and unexpected inflation becomes:

(5.27A) $\hat{p}^u = \dfrac{h_0 + \Omega_0 + (h_1 + \Omega_1)e - 1}{h_2 + \Omega_2}\,.$

The realised wage and profit shares are then:

(5.30A) $$\Omega = \frac{\Omega_0 h_2 + \Omega_2 (1 - h_0) + (\Omega_1 h_2 - \Omega_2 h_1) e}{h_2 + \Omega_2},$$

(5.31A) $$h = \frac{h_0 \Omega_2 + h_2 (1 - \Omega_0) + (h_1 \Omega_2 - h_2 \Omega_1) e}{h_2 + \Omega_2}.$$

With

(5.30Aa) $$\frac{\partial \Omega}{\partial e} = \frac{\Omega_1 h_2 - \Omega_2 h_1}{h_2 + \Omega_2},$$

and

(5.31Aa) $$\frac{\partial h}{\partial e} = \frac{h_1 \Omega_2 - h_2 \Omega_1}{h_2 + \Omega_2},$$

If $h_1 \Omega_2 - h_2 \Omega_1 > 0$, we will have $\frac{\partial h}{\partial e} > 0$ and $\frac{\partial \Omega}{\partial e} < 0$.

**Figure 5.A.I: Conflicting claims, distribution and inflation in the Hein and Stockhammer approach with a pro-cyclical profit share**

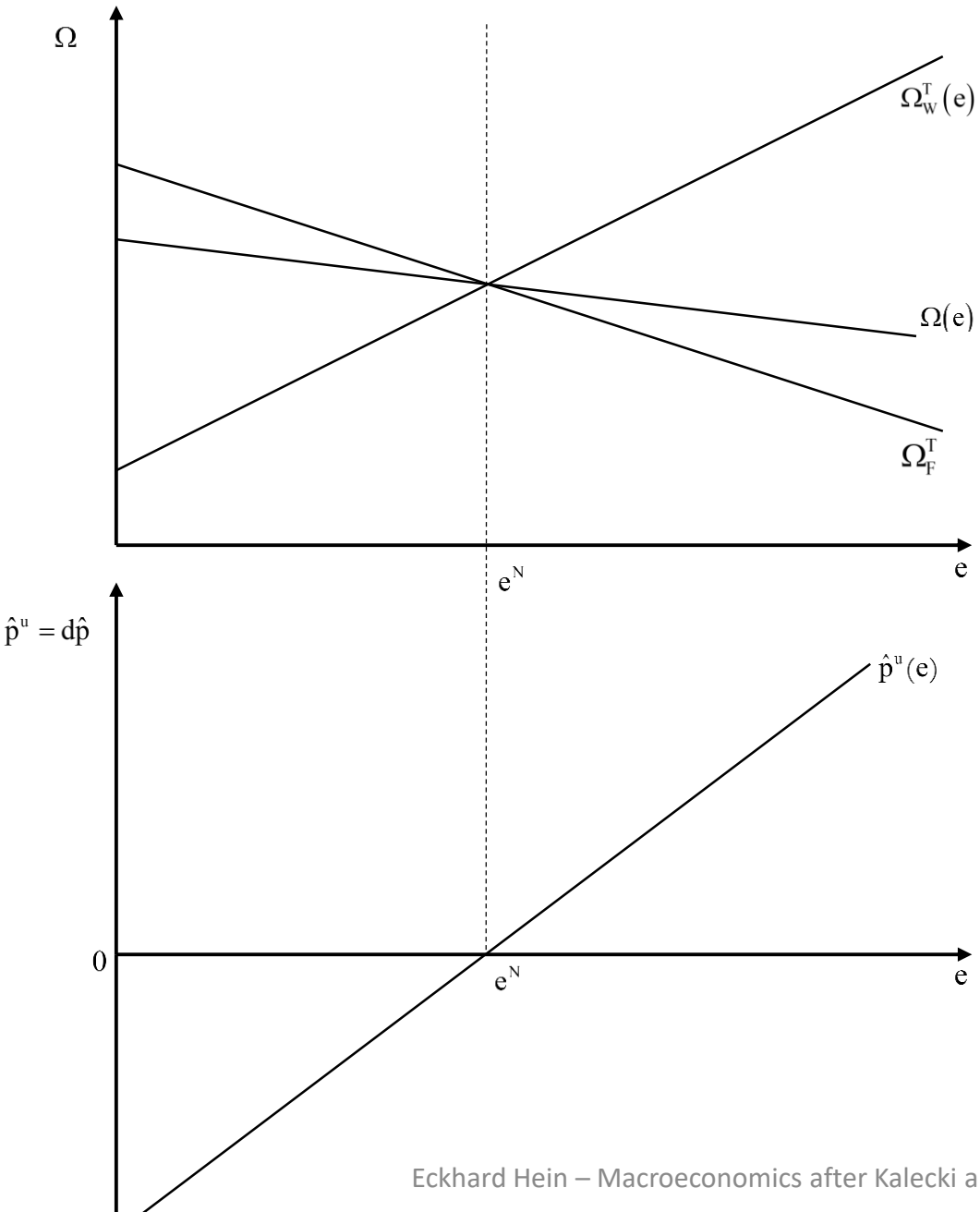


**Table 5.A.I: Inflation and distribution effects of deviations of the employment rate from the SIRE or of deviations of the unemployment rate from the NAIRU: the case of a pro-cyclical profit share**

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

# APPENDIX 5.II:
# THE DYNAMICS OF THE CLOSED ECONOMY MODEL IN A WAGE SHARE-EMPLOYMENT RATE SPACE

Blecker and Setterfield (2019, Section 5.3): dynamic interaction of the wage share and the rate of capacity utilisation in a distribution and growth framework

Aggregate demand (AD) curve as a function of the wage share (or the profit share): wage- or profit-led demand,

Distributive curve (DC): wage share as a function of the rate of capacity utilisation: profit squeeze or wage squeeze

- First case of a wage-led demand regime with a wage squeeze distributive regime is stable.
- Second case of a wage-led demand regime with a weak profit squeeze distributive regime is stable, too.
- Third case of a wage-led demand regime with a strong profit squeeze distributive regime is unstable.

# Our model of Section 5.4

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Demand or employment regime:

(5.44) $$e^* = \frac{q\left[I_a + (1 - s_R - \theta) i_r B_F\right]}{h - \beta} = \frac{q\left[I_a + (1 - s_R - \theta) i_r B_F\right]}{1 - \Omega - \beta}$$

Distributive regime:

(5.30) $$\Omega = \frac{(\Omega_0 + \Omega_1 e) h_2 + \Omega_2 (1 - h_0)}{h_2 + \Omega_2}.$$

Wage-led demand:

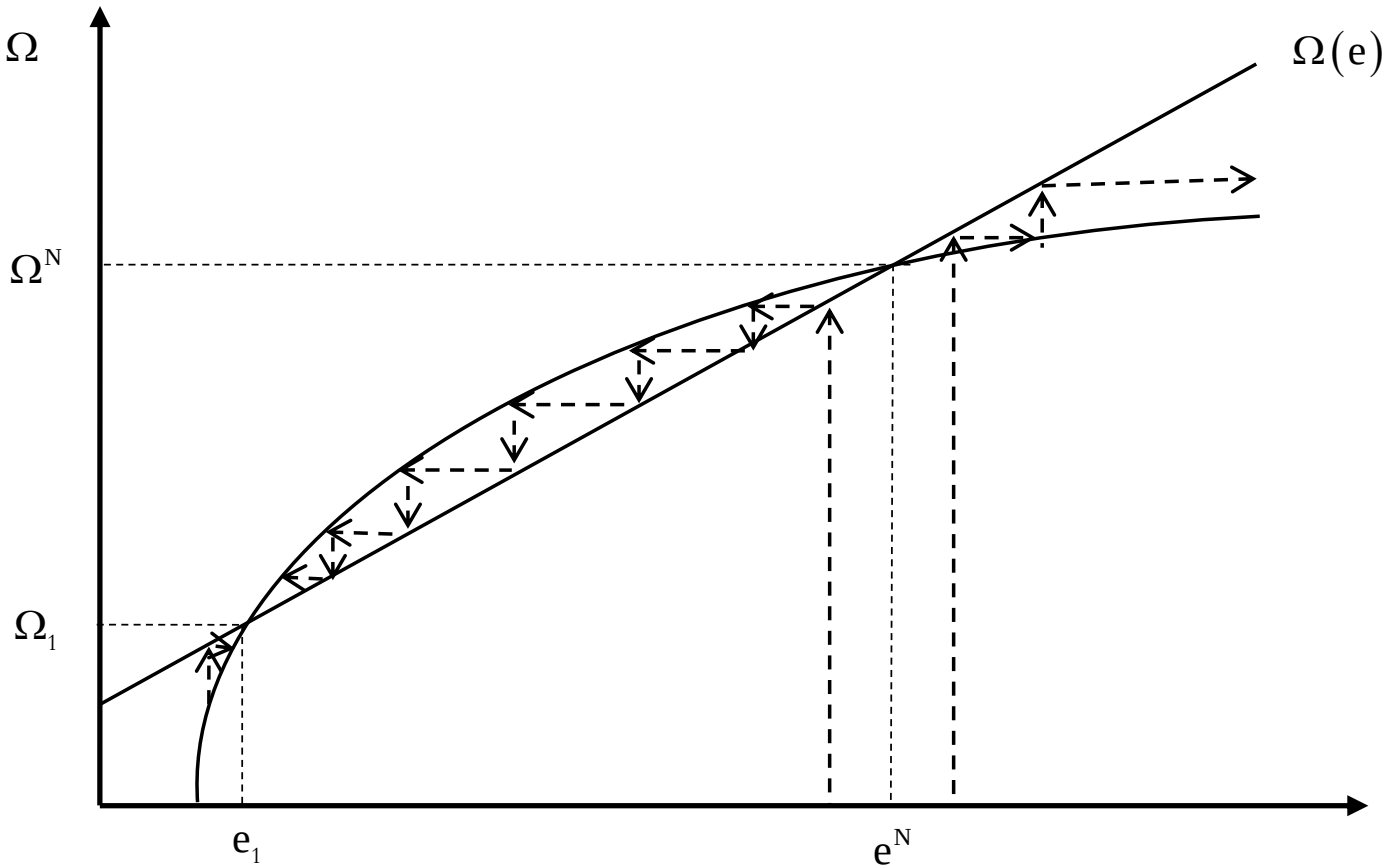
(5.44A) $$\frac{\partial e^*}{\partial \Omega} = \frac{q\left[I_a + (1 - s_R - \theta) i_r B_F\right]}{(1 - \Omega - \beta)^2} > 0,$$

Profit squeeze distribution:

(5.30A) $$\frac{\partial \Omega}{\partial e} = \frac{\Omega_1 h_2}{h_2 + \Omega_2} > 0.$$

**Figure 5.A.II: Interaction of wage share and employment rate in the closed economy model – ignoring real interest rate effects**






Destabilising effects of unexpected inflation via distribution between firms and rentiers are ignored.