

Open economy models of distribution and growth

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1 Introduction

Post-Keynesian models of growth and distribution are founded upon two core principles: (i) that the functional distribution of income between wages and profits is determined by the mark-up pricing decisions of industrial firms; and (ii) that aggregate demand depends in important ways on the functional distribution of income.¹ While the previous chapter develops post-Keynesian macro models for closed economies, the present chapter focuses on extensions of these models for countries that are open to international trade and financial flows. These extensions are vital for applying the post-Keynesian framework to a global economy that has become much more integrated in the past few decades as a result of trade liberalization, financial deregulation and technological change (especially in transportation and communication). In addition, this chapter briefly summarizes empirical tests of post-Keynesian macro models, most of which have emphasized differences between closed and open economies.

Adding open economy features alters the likely outcomes of post-Keynesian models compared with closed economy versions. This chapter will show that countries that are highly open to international competition and whose exports and imports are relatively price-sensitive are likely to be less strongly wage-led, or more likely to be profit-led, than closed economies (or open ones without strongly price-sensitive trade volumes). This chapter also shows that the relationship between distribution and growth varies depending on the source of a distributional change in an open economy. Since most empirical studies have taken income distribution as exogenously given and have not investigated the sources of distributional shifts, the varying results of these studies may be due in part to their failure to identify the different possible channels of causality modelled here.

In addition, this chapter will show that post-Keynesian models yield insights that are

not found in mainstream open economy macro models. Especially, the conventional analysis of the effects of a currency depreciation on output and the trade balance fails to incorporate how those effects depend on the distributional consequences of the depreciation. Specifically, if an economy is wage-led, a depreciation is likely to have contractionary effects on output but to be relatively effective for improving the trade balance, while if an economy is profit-led, a depreciation is likely to be expansionary for output but less effective for improving the trade balance. Finally, this chapter analyzes the impact of monetary policy on the exchange rate, income distribution and economic growth, showing the multiplicity of possible outcomes and how these vary between “normal” and “crisis” situations in international financial markets.

2 The short-run model of the goods market²

We assume a one-sector economy in which the domestic side of the model is deliberately kept simple since the focus is on the open economy features.³ Industrial prices are set by a mark-up on average variable costs. For simplicity, we ignore raw materials, so labour is the only variable cost, and we also ignore overhead (fixed) costs.⁴ Assuming that labour costs are constant (so that average cost equals marginal cost), the pricing equation for the representative firm is

$$P = (1 + z)Wa_0 \tag{1}$$

where $z > 0$ is the gross profit mark-up rate,⁵ a_0 is the labour coefficient (hours/unit of output), W is the money wage rate (dollars per hour) and Wa_0 is nominal unit labour cost. The mark-up rate z reflects Kalecki’s (1954) “degree of monopoly”, which depends positively on the degree of industrial concentration, the level of overhead costs and the sales effort, and inversely on the power of labour unions (all of which are taken as exogenously given and not

explicitly modelled here). In an open economy, the mark-up is also influenced by the degree of foreign competition. The wage rate W and mark-up z are taken as fixed in the short run, but will be made endogenous in response to changes in international competitiveness in the dynamic model of inflation and distribution in the next section.⁶

Since we assume no raw materials costs, price equals value added, and the profit share is $\pi = (P - Wa_0)/P$. Substituting (1) into this expression and simplifying yields

$$\pi = \frac{z}{1+z} \quad (2)$$

where $\partial\pi/\partial z > 0$. Furthermore, using the definition of the profit rate r and assuming no depreciation for simplicity,

$$r = \frac{(P - Wa_0)Y}{PK} = \frac{z}{1+z}u = \pi u \quad (3)$$

where Y is real output, K is the capital stock and $u = Y/K$ is the output-capital ratio used as a proxy for the rate of capacity utilization.⁷ In this model, the real wage can be expressed in any of the following ways:

$$w = \frac{W}{P} = \frac{1}{a_0(1+z)} = \frac{1-\pi}{a_0} = \frac{\psi}{a_0} \quad (4)$$

That is, the real wage is positively related to the productivity of labour ($1/a_0$) and inversely related to either the mark-up rate z or (equivalently) the profit share π . The real wage can also be expressed as the wage share ($\psi = 1 - \pi = 1/(1+z)$) divided by the labour coefficient a . Hence, the real wage can change only if there is a change in relative shares or labour productivity.

We assume that profit income is saved at a higher rate than wage income, but there may be positive saving out of wages. Wages are saved at a rate that is less than the saving rate out of profits ($0 \leq s_w < s_r < 1$) for two reasons: (i) a portion of corporate profits is typically saved by corporations as “retained earnings,” which are used for the internal finance

of investment, while there is no corresponding “retention” of wage income; and (ii) owners of firms (proprietors or stockholders) and other recipients of gross profits (e.g., bondholders who receive interest payments) tend to be high-income, wealthy individuals with higher marginal propensities to save than workers.⁸ Defining the ratio of saving to the capital stock as $\sigma = S/K$, the saving function can be written as

$$\sigma = [s_p\pi + s_w(1-\pi)]u \quad (5)$$

where the saving rates are weighted by the income shares of profits and wages and multiplied by u for proportionality to the capital stock.⁹

Following Marglin and Bhaduri (1990) and Taylor (2004b), we use the most general (implicit) form of a neo-Kaleckian investment function:¹⁰

$$g = f(\pi, u, \alpha), \quad f_\pi, f_u, f_\alpha > 0 \quad (6)$$

where $g = I/K$ is the ratio of investment to capital and α is a shift parameter. This function thus captures three of the most fundamental determinants of investment:¹¹ profitability (measured here by the profit share),¹² aggregate demand (utilization of existing capacity)¹³ and the state of business confidence (Keynes’s “animal spirits,” represented by α).

The government sector is omitted for simplicity.¹⁴ The trade balance (in real terms, measured as a ratio to the capital stock) can be written as the implicit function

$$b = TB/K = b(q, u, u^*), \quad b_q > 0, b_u < 0, b_{u^*} > 0, \quad (7)$$

where $TB = X - qM$ is the trade balance (i.e., net exports or the trade surplus) measured in domestic goods, X is the volume of exports, M is the volume of imports, $q = EP^*/P$ is the real exchange rate, E is the nominal exchange rate (home currency/foreign currency), P^* is the foreign price level and u^* is the foreign utilization rate (in obvious notation, $u^* = Y^*/K^*$). Note that q is the relative price of foreign goods, so a higher q indicates a real depreciation of the home currency or increased competitiveness of home goods.¹⁵ We will generally assume that the Marshall-Lerner (M-L) condition holds ($b_q > 0$), but will also consider the

consequences if M-L is violated.¹⁶

From the open economy national income identity with no government, $S + qM = I + X$ (all measured in “real” terms in domestic goods), the goods market equilibrium condition is:

$$\sigma = g + b . \quad (8)$$

Thus, in the absence of a government sector, a nation’s savings are spent on financing investment (g) and the trade surplus (b); if there is a trade deficit ($b < 0$), then the excess of domestic investment over national saving is financed by a corresponding inflow of foreign saving. When trade is imbalanced ($b \neq 0$), the capital stock grows at the rate $g = \sigma - b$.

Substituting (5), (6) and (7) into (8) and rearranging slightly, we obtain the following implicit solution for goods market equilibrium (u as a function of π , α , q and u^*):

$$[(s_r - s_w)\pi + s_w]u = f(\pi, u, \alpha) + b(q, u, u^*). \quad (9)$$

The goods market (Keynesian) stability condition is found by analysing the conditions for adjustments in the utilization rate u to eliminate excess demand for goods (EDG), defined as

$$EDG = g + b - \sigma = f(\pi, u, \alpha) + b(q, u, u^*) - [(s_r - s_w)\pi + s_w]u . \quad (10)$$

Thus, the short-run stability condition is

$$\partial EDG / \partial u = f_u + b_u - [(s_r - s_w)\pi + s_w] < 0 , \quad (11)$$

or $(s_r - s_w)\pi + s_w - b_u - f_u > 0$. Intuitively, this means that saving (out of wages and profits combined, plus net inflows of foreign saving equal to the trade deficit) must respond more than investment to increases in utilization, so that excess demand is eliminated rather than exacerbated by increases in utilization. Recalling that $b_u < 0$, the openness of a country to trade has a stabilizing impact because higher domestic utilization (output) increases imports and decreases the trade balance, thereby dampening further increases in demand.

Since the investment and trade balance functions (equations 6 and 7) are non-linear, we cannot obtain an explicit solution of (9) for u in the present model. However, it is easy to find the slope of the equilibrium relationship described by (9), assuming that the mark-up z

and (equivalently) the profit share π are fixed in the short run. Totally differentiating (9) with respect to u and π , we obtain:

$$\frac{\partial u}{\partial \pi} = \frac{-[(s_r - s_w)u - f_\pi]}{(s_r - s_w)\pi + s_w - f_u - b_u}, \quad (12)$$

The denominator of (12) must be positive by the stability condition (11), but the numerator can be either positive or negative. The economy is said to be “stagnationist” or to have “wage-led demand” when this derivative is negative ($\partial u/\partial \pi < 0$), and is “exhilarationist” or has “profit-led demand” when it is positive ($\partial u/\partial \pi > 0$).¹⁷ Evidently, a relatively high saving rate out of profits s_r makes the economy more likely to have wage-led demand, while either a relatively high saving rate out of wages s_w or a relatively high sensitivity of investment to profitability f_π makes the economy more likely to have profit-led demand.¹⁸

We are interested in the effects of a change in income distribution on growth (capital accumulation) as well as on utilization. Differentiating (6) with respect to u and using (12), we obtain the total derivative

$$\frac{dg}{d\pi} = \frac{(s_r - s_w)(f_\pi \pi - f_u u) + f_\pi (s_w - b_u)}{(s_r - s_w)\pi + s_w - f_u - b_u}, \quad (13)$$

which has a positive denominator (by the stability condition) and an ambiguously signed numerator. A relatively large profitability effect on investment ($f_\pi \pi$), combined with a relatively high saving rate out of wages (s_w) or greater openness to imports (a more negative b_u), makes growth more likely to be profit-led ($dg/d\pi > 0$); a relatively large utilization effect on investment ($f_u u$) combined with a relatively high saving rate out of profits (s_r) makes growth more likely to be wage-led ($dg/d\pi < 0$).¹⁹

[Figure 4.1 about here]

These distinctions between wage- and profit-led demand and wage- and profit-led growth are illustrated in Figure 4.1. In each panel, the goods-market equilibrium condition (9) is represented as the “IS curve”.²⁰ Downward-sloping IS curves (top two panels) indicate

wage-led demand, while an upward-sloping IS curve (bottom panel) indicates profit-led demand. The growth rate can be represented on the same diagrams by a set of “iso-growth curves”, each of which represents a constant level of g (where higher subscripts indicate higher growth rates).²¹ Setting (6) equal to zero and totally differentiating, the slopes of these curves are given by the partial derivative $\partial g/\partial \pi = -f_u/f_\pi < 0$, which describes curves that may be either steeper or flatter than IS when the latter is downward-sloping.²² In Figure 4.1, moving from lower to higher profit shares, we see that in panel (a) the growth rate decreases along with the utilization rate, while in (b) the growth rate rises even though the utilization rate is falling, and in (c) both the utilization and growth rates increase. Thus, profit-led demand always corresponds to profit-led growth, while wage-led demand can occur with either wage-led or profit-led growth.

The preceding analysis pertains to a short-run situation in which the real exchange rate q is taken as given, and hence ignores possible connections between changes in income distribution, external competitiveness and aggregate demand. However, many theoretical models imply (and a large empirical literature confirms) that changes in real exchange rates can have significant effects on profit mark-ups and hence on relative shares of national income.²³ A real depreciation (rise in q) allows firms to increase their profit mark-ups z because foreign competing goods become relatively more expensive, thereby depressing real wages via equation (4) and boosting the profit share via (2). Furthermore, if mark-ups are flexible in response to changes in external competition, both real exchange rates and income shares can be affected by changes in nominal unit labour costs (Wa_0). In the next section, we will incorporate the sensitivity of the mark-up rate and relative shares to international competitiveness in conjunction with the dynamics of wage and price adjustment.

3 Medium-run dynamics: inflation, distribution and the exchange rate

In the short-run model, we took nominal wages and prices (W , P and P^*), the mark-up rate z and the nominal exchange rate E as exogenously given (and, therefore, the profit share π and real exchange rate q were also effectively fixed). However, over a longer period of time (say, a few quarters to a few years), we would expect wages and prices to change in response to conditions affecting workers' bargaining power and firms' pricing decisions, while exchange rates would be likely to vary depending on conditions in international financial markets. We call this time period in which wages, prices, distribution and the exchange rate adjust the "medium run", and define the medium-run equilibrium as a steady state in which π and q reach constant levels determined by the underlying structural parameters and expectations.²⁴

To explain changes in wages, prices and distributive shares, post-Keynesian economists have developed the "conflicting claims" approach to inflation and income distribution.²⁵ In this approach, workers and firms each have targets for wages and profits, respectively. Firms set prices in pursuit of a target profit mark-up, but their price-setting power is subject to various constraints (for example, domestic or foreign competition, anti-trust regulation and capacity utilization). Although workers care about their real wage (or share of value added), they are normally constrained to bargain over the nominal wage (except in situations where strong indexation effectively allows workers to bargain over the real wage). Workers' bargaining power is influenced by factors such as labour market regulations, competition with "outside" workers (e.g. unemployed, non-union or foreign workers) and the unemployment rate. The claims of workers and firms are said to be "conflicting" if what each group wants for itself would imply the other group getting less than its target. This conflict generates inflation if both groups raise nominal wages and prices in an effort (which in general can only be partially successful for each side) to achieve their

respective target income levels (or shares).

To maintain the focus on international competition, we abstract from other factors besides the real exchange rate that could influence wage- and price-setting. Thus, for simplicity, we do not consider the very important feedbacks of aggregate demand and employment onto wages and prices that were analysed in chapter 3. We assume that workers and firms set nominal wages and prices (respectively) according to the following “reaction functions”:

$$\hat{W} = \phi(\psi_w - \psi) \quad (14)$$

$$\hat{P} = \theta(\psi - \psi_f) \quad (15)$$

where a “^” over a variable indicates an instantaneous rate of change and $\phi, \theta > 0$. Workers are assumed to target the wage share ψ_w , which implies a real wage that grows along with labour productivity (which for simplicity we assume rises at the exogenous rate $\varepsilon = -\hat{a}_0 > 0$). Firms are assumed to set a target profit mark-up rate z_f , which is equivalent to an implicit target of firms for the wage share, $\psi_f = 1/(1+z_f)$. Presumably, firms would prefer a lower wage share while workers want a higher one, so we assume $\psi_f < \psi_w$. The parameters $\phi > 0$ and $\theta > 0$ are the speeds of adjustment of nominal wages and prices, respectively, toward their targets. Given some degree of short-run nominal wage and price rigidity, this adjustment takes time, and therefore W and P are “state variables” that are given at any point in time and adjust gradually toward the medium-run equilibrium.

To introduce exchange rate effects, let us assume that the firms’ target mark-up rate is an increasing function of the real exchange rate (that is, a depreciation induces a higher target mark-up): $z_f = z_f(q)$, $z_f'(q) > 0$, which implies $\psi_f = 1/[1+z_f(q)]$, $\psi_f'(q) < 0$. For mathematical convenience, we linearize this relationship and assume $\psi_f = \tau - \beta q$, where τ is a constant parameter that varies *inversely* with the market power of firms due to domestic factors. Then

the price reaction function (15) becomes

$$\hat{P} = \theta(\psi - \tau + \beta q) . \quad (15')$$

While the real exchange rate does not enter directly into the wage reaction function (14), it has an indirect influence on wages because a depreciation tends to lower the wage share, which increases the gap between the workers' target ψ_w and the actual ψ , and this in turn leads workers to demand greater nominal wages increases.²⁶

In either a flexible or managed exchange rate regime, the nominal rate E can also be treated as a state variable. A mathematically convenient functional form with several appealing intuitive interpretations is:

$$\hat{E} = \mu(\bar{q} - q) . \quad (16)$$

For a country with a managed exchange rate (i.e. an intermediate regime, neither rigidly fixed nor freely floating), \bar{q} can be interpreted as the monetary authority's medium-run target for the real exchange rate, and μ is the speed of adjustment with which the nominal exchange rate is adjusted to achieve that target (e.g. in a crawling peg regime). For a country with a floating rate, one can think of \bar{q} as the dominant view of foreign exchange market participants about the medium-run sustainable level of the real exchange rate, and one can assume that currency trading moves the nominal exchange rate gradually so as to close the gap between this medium-run expected level and the actual level.²⁷ Importantly, \bar{q} need *not* correspond to any conventional view of a long-run equilibrium real exchange rate, such as one determined by purchasing power parity or some unique set of macroeconomic "fundamentals".²⁸ The dominant view that determines \bar{q} could shift based on "news" or a change in expectations, but empirical evidence suggests that exchange rate expectations are revised only periodically and actual exchange rates move gradually in a new direction rather than "jumping" as implied by rational expectations models (Frydman and Goldberg, 2007).

For mathematical convenience, it is easier to analyse the dynamics of distribution in terms of wage share rather than the profit share, and the results are equivalent since $\psi = 1 - \pi$. To find the medium-run solution, therefore, we obtain two differential equations in two state variables by logarithmically differentiating the definitions $\psi = Wa_0/P$ and $q = EP^*/P$ with respect to time and converting to growth rates (indicated by a $\hat{\cdot}$):

$$\hat{\psi} = \hat{W} + \hat{a}_0 - \hat{P} \quad (17)$$

$$\hat{q} = \hat{E} + \hat{P}^* - \hat{P} \quad (18)$$

Substituting (14), (15') and (16) into (17) and (18), we obtain:

$$\hat{\psi} = \phi(\psi_w - \psi) - \varepsilon - \theta(\psi - \tau + \beta q) \quad (17')$$

$$\hat{q} = \mu(\bar{q} - q) + p^* - \theta(\psi - \tau + \beta q). \quad (18')$$

where we use $\varepsilon = -\hat{a}$ and assume that foreign prices increase at the exogenously given rate $\hat{P}^* = p^*$. Setting $\hat{\psi} = 0$ and $\hat{q} = 0$ in (17') and (18') respectively, we obtain the demarcation curves or isoclines

$$\hat{\psi} = 0 \Rightarrow \psi = \frac{\phi\psi_w - \varepsilon + \theta(\tau - \beta q)}{\phi + \theta} \quad (19)$$

$$\hat{q} = 0 \Rightarrow q = \frac{\mu\bar{q} + p^* - \theta(\psi - \tau)}{\theta\beta + \mu}. \quad (20)$$

[Figure 4.2 about here]

Equations (19) and (20) are graphed on the right-hand side of Figure 4.2, where $\hat{\psi} = 0$ is shown as “DC” (distributive curve) and $\hat{q} = 0$ is shown as “FE” (foreign exchange curve). Both curves are downward sloping, but FE must be steeper than DC implying stability of the steady-state equilibrium point at which they intersect (where $\hat{\psi} = \hat{q} = 0$).²⁹ Stability of the *model equilibrium* does not mean that *exchange rates* are “stable” in the sense that they always converge to purchasing power parity or some other fundamentals-

determined level as in conventional models, but simply that they gradually adjust toward whatever are the market's expectations (or the policy makers' target, in an intermediate regime) during any given medium-run period.

Figure 4.2 combines the FE-DC diagram with a (modified) IS curve representing the short-run equilibrium; the economy must be on the latter curve at all times. Since this IS curve is drawn in $u \times \psi$ space, it has the opposite slope from what was shown in Figure 4.1 because $\psi = 1 - \pi$ (thus, the upward-sloping IS curve in Figure 4.2 represents domestically wage-led demand).³⁰ The intersection of FE and DC determines the equilibrium combination of q and ψ , which in turn determines both the location of the IS curve (since q is a shift factor in equation 9) and the equilibrium point along IS (since the slope of IS represents the response of u to ψ).³¹ Substitution of the equilibrium solutions for q and ψ into (15') then yields the solution for the equilibrium inflation rate.³² In the next section, we apply this model to the classic question of the effects of a change in the exchange rate.

4 Exchange rates and income distribution

A currency depreciation can result from an increase in \bar{q} , which can be given either of two interpretations. In a managed exchange rate regime, a rise in \bar{q} would indicate a decision of the monetary authorities to seek a lower target real value for the home currency. In a floating rate regime, a rise in \bar{q} could occur because currency traders revise their expectations about future sustainable levels of the real exchange rate in the direction of believing that it must depreciate (for example, because of large trade deficits or a loss of confidence in the country). As shown in the right panel of Figure 4.3, a rise in \bar{q} shifts the FE curve to the right; the medium-run equilibrium real exchange rate depreciates (q rises from q_0 to q_1) while the medium-run equilibrium wage share ψ falls (from ψ_0 to ψ_1).

[Figure 4.3 about here]

The rise in q also affects the location of the IS curve; the shift in IS is given by the following comparative static derivative from the short-run model:

$$\frac{\partial u}{\partial q} = \frac{b_q}{(s_r - s_w)\pi + s_w - f_u - b_u} . \quad (21)$$

The denominator is positive assuming the short-run stability condition (11), and if the M-L condition also holds (so that $b_q > 0$), then IS shifts to the right (to IS' in Figure 4.3). If M-L is violated, however, IS could shift to the left (if $b_q < 0$) or simply not move (if $b_q \approx 0$).

However, this is only the *direct* impact of the depreciation on utilization, since the partial derivative (21) holds distribution ψ constant. Therefore, to determine what happens to u in the new medium-run equilibrium, we must also take into account the change in ψ from the right panel of the diagram.

To begin with, note that, if the IS curve does not shift, the reduction in ψ will cause u to fall (from u_0 to u_2) along the upward-sloping IS curve in Figure 4.3. Indeed, this is precisely what happens if M-L is not satisfied ($b_q \approx 0$). However, if M-L holds so that the depreciation improves the trade balance, then IS shifts to the right, which either reduces the decrease in u or possibly makes u increase (e.g. to point u_1 in Figure 4.3). Thus, if the price elasticities of import and export demand are sufficiently high so that M-L effects are relatively strong, it is possible for u to rise while ψ falls in response to the currency depreciation. We refer to this as a situation in which demand is profit-led “overall”, even though it is wage-led “domestically”.

Taking the open economy effects into account, then, an economy may exhibit profit-led demand in its overall response to a depreciation, even though demand is domestically wage-led as indicated by an upward-sloping IS curve; alternatively, the open economy effects could diminish (but not reverse) the wage-led character of demand. If, however, an economy

is domestically profit-led, then the open economy effects would only intensify the degree to which demand is profit-led (this would involve a downward-sloping IS curve that would shift to the right in a diagram otherwise similar to Figure 4.3).

4.1 Effectiveness of a depreciation policy

Governments often seek to engineer currency depreciations with the twin objectives of improving the trade balance and stimulating output (and employment). This can be done in a managed exchange rate regime by changing the peg or target for the currency, and in a flexible rate regime through either exchange market intervention (buying foreign currency reserves) or efforts to influence market expectations (e.g., “talking down the dollar” in the late 1980s). Economists have been debating the effectiveness of depreciation as a tool for either of these objectives for a long time, and post-Keynesians are as divided on the subject as their neoclassical counterparts. Although we cannot resolve this debate here—and the answer is largely empirical, not theoretical—the model developed above yields important insights into what determines the effectiveness of a depreciation for these two policy objectives.

Given the likelihood that a currency depreciation redistributes income away from wages and toward profits, the impact on both the trade balance and output (utilization) depends on whether the economy is wage- or profit-led. If demand is wage-led overall (i.e. including open economy effects), a depreciation is contractionary for output (Díaz-Alejandro, 1963; Krugman and Taylor, 1978). However—since a fall in output reduces import demand—a depreciation is likely to be relatively effective for improving the trade balance in this case. In contrast, if demand is profit-led overall, a depreciation must be expansionary for output but is less likely to be effective for improving the trade balance (since the increase in u

boosts import demand and $b_u < 0$), as noted by Blecker (1999). Regardless of the effects on output or the trade balance, the impact of a depreciation on inflation is unambiguously positive.³³

5 Distribution and demand in open economies

A real depreciation caused by a change in exchange rate expectations (or the exchange rate target of the monetary authority) is only one of several possible causes of simultaneous changes in distribution and utilization in an open economy. As this section will show, the conditions that determine whether demand is wage- or profit-led vary considerably depending on the *source* of the change in distribution, and hence *it is not possible to give a unique characterization of an open economy as having wage-led or profit-led demand under all circumstances*.

Consider first an increase in workers' bargaining power, which can be modelled as a rise in their target wage share ψ_w . This shifts DC upward to DC', causing medium-run equilibrium ψ to rise (from ψ_0 to ψ_1) and q to fall (from q_0 to q_1) in Figure 4.4. In addition, the IS curve shifts leftward to IS' due to the currency appreciation (assuming M-L holds). Assuming demand is domestically wage-led, there are two offsetting effects: on the one hand, the rise in ψ is expansionary; on the other hand, the leftward shift in IS is contractionary. Thus, the net impact on u is ambiguous (and hence not shown in the diagram): u rises if the boost to domestic consumption outweighs the reduction in the trade balance and falls in the converse case (with investment possibly going in either direction). The net effect depends on factors such as the price elasticities of import and export demand and the relative weight of trade in domestic output. The more price-elastic is the demand for exports and imports, the lower are trade barriers and the smaller is the country (so the higher is the trade share of

output), the more likely it is that the overall impact would be negative (and conversely).

[Figure 4.4 about here]

Now, consider instead a reduction in the domestic market power of home country firms (for example, because of stronger competition policies or reduced entry barriers), which raises the shift parameter τ . This shifts DC upward to DC' and also shifts FE rightward to FE', causing both q and ψ to rise (to q_2 and ψ_2) in the medium run in Figure 4.4.³⁴ Since there is a real depreciation, IS shifts rightward to IS'' (assuming M-L holds), and the overall impact on u is likely to be strongly expansionary (u rises to u_2).³⁵ Thus, a redistribution toward wages that originates from increased domestic competition is much more likely to be expansionary than a redistribution toward wages that originates from increased workers' bargaining power, because they have opposite effects on the real exchange rate and external competitiveness.³⁶ Furthermore, a redistribution toward wages that results from a change in exchange rate expectations (or the exchange rate target in a managed rate regime) can be associated with either an expansion or contraction of output under yet different conditions, as shown in the previous section. Hence, an economy characterized by the same underlying structural parameters could exhibit either wage- or profit-led demand—or stronger or weaker wage-led demand—depending on the *source* of the simultaneous changes in income distribution and the real exchange rate. Matters grow even more complicated when we consider the potential impact of monetary policy in the next section.

6 Monetary policy and floating exchange rates

We assume that monetary policy is carried out by a central bank that sets an interest rate target for a short-term, money market asset (which is not explicitly modelled). In addition, we assume for simplicity that there is a single interest rate (or, implicitly, that all other interest

rates such as bank prime rates are fixed mark-ups of the money market rate set by the central bank). Although there are many channels through which interest rates can affect distribution and utilization in an open economy, we focus here on three major ones.³⁷

First, we expect the interest rate to have a negative effect on investment demand, after controlling for the other factors in the investment function (6). This negative effect could be rationalized on the conventional ground that the interest rate is the cost of borrowed funds, but here we adopt instead the post-Keynesian view that interest payment obligations create “cash commitments” that reduce the internal funds of the firm (Minsky 2008). For intuitive appeal, we adopt the following simplified functional form:

$$g = f(r - i\delta), \quad f' > 0 \quad (6'')$$

where δ is the debt-capital ratio (taken as exogenously given), so $r - i\delta$ can be interpreted as the net rate of return to the enterprise.³⁸

Second, we consider the possibility that higher interest costs may induce firms (*ceteris paribus*) to raise their mark-ups—what Hein (2008) calls the case of an “interest-elastic mark-up”. Since this is an open economy model, we assume that the target mark-up is an increasing function of both the interest rate and the real exchange rate, and hence the firms’ implicit target for the wage share is inversely related to i and q . Mathematically, $z_f = z_f(q, i\delta)$, $\partial z_f / \partial q > 0$, $\partial z_f / \partial (i\delta) > 0$, which implies $\psi_f = 1/[1+z_f(q, i\delta)]$, $\partial \psi_f / \partial q < 0$, $\partial \psi_f / \partial (i\delta) < 0$.³⁹ Using an implicit function for ψ_f (not linearized), (15) becomes

$$\hat{P} = \theta[\psi - \psi_f(q, i\delta)] \quad (15'')$$

Third, we also recognize the impact of interest rate differentials between home and foreign assets on a flexible exchange rate. We assume that home and foreign bonds are imperfect substitutes and that the home country is small so that it takes the foreign interest rate i^* as given. The risk-adjusted interest rate differential in favour of home assets is $i - i^* - \rho$, where ρ is the risk premium. Now, we make two assumptions. First, we assume that when

this differential rises, market sentiment shifts toward expecting an appreciation (so that \bar{q} falls).⁴⁰ Second, we assume that the risk premium is an increasing (but nonlinear) function of the interest rate, since a very high interest rate heightens fears of financial fragility (for example, increased bankruptcies of firms). Mathematically, these assumptions can be represented by

$$\bar{q} = \lambda[i - i^* - \rho(i)], \quad \lambda' > 0, \rho(0) < 1, \rho' > 0, \rho'' > 0, \quad (22)$$

so that $\partial\bar{q}/\partial i > 0$ at low interest rates, but $\partial\bar{q}/\partial i < 0$ past some critical threshold of i (at which $\rho'(i) = 1$). Substituting (22) into (16), we obtain

$$\hat{E} = \mu(\lambda[i - i^* - \rho(i)] - q). \quad (16'')$$

Now consider the effects of a central bank decision to raise the interest rate. The possible outcomes are illustrated in Figure 4.5, where the economy starts at point A in the FE-DC diagram. First, consider a “normal” financial market environment in which the risk factor remains low so that the interest rate increase makes home assets more attractive to financial investors. In this case, the rise in i causes FE to shift to the left to FE'. If the mark-up is interest-inelastic, then DC does not shift and the economy ends up (in the medium run) at point B, where the currency has appreciated (q has fallen) and the wage share ψ is higher (the latter occurs because the appreciation squeezes firms' mark-ups and hence lowers the profit share). However, if the mark-up is interest-elastic, then DC shifts downward to DC', and (if the shift in DC is large enough) the economy may possibly end up at a point like C, where the currency has appreciated to a lesser degree than at B and the wage share falls (because the mark-up responds more to the interest rate than it does to the exchange rate). Of course, it is an empirical question which of these responses is likely to be greater.

[Figure 4.5 about here]

Next, consider a financial crisis situation in which the rise in the interest rate causes

the risk factor ρ to rise rapidly, thereby causing market sentiment to shift in favour of a depreciation (so that \bar{q} rises). This situation, which has been observed in many actual crises (for example, in East Asia in 1997-98),⁴¹ is represented by the shift of FE to the right to FE'' in Figure 4.5. Now, if the mark-up is interest-inelastic the economy moves to point G in the medium run, while if the mark-up is interest-elastic it moves to H. At both of these points, the exchange rate necessarily depreciates (medium-run equilibrium q is higher) and the wage share necessarily falls, but the results are even more extreme if the mark-up is interest-elastic (point H).

In the left panel of Figure 4.5, we illustrate some possible shifts of the IS curve in response to the interest rate increase (assuming again that demand is domestically wage-led). First, the direct negative effect on investment implies a leftward shift to IS', where u is lower for any given ψ . If the currency appreciates, as seems likely in the normal situation, IS could shift further to the left (to IS'') if the M-L condition holds. Then the possible rise or fall in ψ would move the economy up or down along IS'', creating more or less of a contractionary effect. On the other hand, in a crisis situation where the currency depreciates, IS could possibly shift back toward its original position but output would still be likely to contract (u would fall) due to the large decrease in ψ . Exact outcomes are not shown in Figure 4.5 because of the large number of possible cases, but overall an interest rate increase is (not surprisingly) likely to be contractionary. What this analysis reveals, however, is that utilization will fall further if either: (a) the currency appreciates in the normal case, causing a worsening of the trade balance that exacerbates the decline in investment; or (b) the wage share falls sharply in a crisis situation, causing a collapse of consumption that outweighs any benefit of the depreciated currency on the trade side.

7 Empirical studies

Since Blecker (1989a), Bhaduri and Marglin (1990) and Marglin and Bhaduri (1990) first demonstrated the possibility of both wage- and profit-led regimes occurring in demand-driven economies, a sizeable empirical literature has arisen attempting to determine which regime best describes a variety of countries around the world. Especially, the suggestion by these authors that open economies may be more likely to be profit-led than closed economies under certain conditions has led to an emphasis in this literature on comparing overall results including open economy effects with estimates of what would occur domestically in the absence of those effects. The survey in this section is very brief, and hence unavoidably oversimplifies in many respects. The intention is simply to convey what the current state of the literature is and to identify the most promising directions for future research.

Empirical studies in this vein can be divided into two broad groups: structural models, which estimate separate functions for consumption (or saving), investment and net exports (or exports and imports separately); and aggregative models, which estimate the overall relationship between distribution and utilization (or growth) but do not estimate the various components of aggregate demand separately. The first type of study usually distinguishes “closed economy” from “open economy” effects by identifying the former with the results of the consumption (or saving) and investment functions alone (essentially, the slope of the IS curve in this chapter, or what we have called domestically wage-led or profit-led demand) and the latter with the overall results including changes in net exports. The second type of study, which does not disaggregate output (or utilization) into its component parts, only tests for the overall relationship and cannot distinguish closed versus open economy effects.

The earliest studies found mixed results. Bowles and Boyer (1995) estimated individual equations for saving, investment and net exports for five countries, and found that

all five had wage-led domestic economies, but three (France, Germany and Japan) were profit-led overall (including open economy effects) while two (the UK and US) remained wage-led even including net exports. However, Gordon (1995) found that the US economy was weakly profit-led domestically and strongly profit-led overall, and noted that “the estimated coefficients from the net-export equation are instrumental in determining the final sign of the utilization function” (p. 361).

More recent estimates of structural models have also found mixed results. Naastepad (2006) found that the Netherlands was wage-led both domestically and overall, but only weakly so. Naastepad and Storm (2006–7) found that five countries (France, Germany, Italy, Spain, Netherlands, and the UK) were wage-led both domestically and overall, while two (Japan and the US) were profit-led in both respects. However, Ederer and Stockhammer (2007) found that France was wage-led domestically and profit-led overall. Stockhammer, Önarar and Ederer (2009) found that the Euro area as a whole (original 12 members) was wage-led both domestically and overall, but did not consider individual countries. In contrast, Hein and Vogel (2008) studied six industrialised countries both inside and outside the Euro area (Austria, France, Germany, the Netherlands, the UK and the US). They found that the two smallest countries in their sample (Austria and the Netherlands) were both profit-led overall, and one of them (Netherlands) was profit-led domestically. The four larger countries (France, Germany, UK and US) were all found to be wage-led both domestically and overall.

While these results vary notably, a meta-analysis of the structural models suggests that the most common finding is that most countries are typically wage-led domestically and at least some countries are profit-led overall (though the studies disagree on which ones these are). Hein and Vogel’s finding that small open economies like Austria and the Netherlands are profit-led overall corresponds to theoretical expectations, as does Stockhammer et al.’s finding that the entire Euro area (a very large and relatively closed economy) is wage-led.

The contrary results of other authors showing that small countries like the Netherlands are wage-led while larger countries such as France, Japan or the US are profit-led (overall) are more anomalous theoretically, but not necessarily wrong.

Turning to aggregative models, Stockhammer and Önarán (2004) estimated vector autoregression (VAR) models for the US, UK and France, and found that shocks to the profit share had no significant overall effects on utilization. Fernandez (2005) estimated a simultaneous equations model for capacity utilization and the profit share in the US economy for 1955-2004. He found that the profit share had a significant positive effect on the utilization rate, i.e. the US had profit-led demand overall. He also found that the international labour cost competitiveness ratio (import prices relative to domestic unit labour costs) was the only variable that was generally significant in explaining the profit share; a higher ratio (indicating a real depreciation) had a positive effect on the profit share. Barbosa-Filho and Taylor (2006) also found that the US economy was profit-led using a VAR model for 1948-2002 and several sub-periods; they also found that the wage share was generally an increasing function of utilization. Önarán and Stockhammer (2005) estimated VAR models for Turkey and South Korea, and found evidence of wage-led behaviour in both.

The differences in all these results undoubtedly stem from the numerous differences in the model specifications and econometric methods used in these studies. A detailed discussion of all those differences would be beyond the scope of this chapter. Nevertheless, while it is understandable that there might be different results for different countries, the fact that different studies using different methodologies have found such different results for the *same* countries is disconcerting. More attention to identifying correct model specification, both theoretically and econometrically, could be important in resolving some of these discrepancies. Another suggestion is that future research should test for structural breaks or experiment with nonlinear models or time-varying parameters.⁴² Many countries have

undergone significant structural changes during the past few decades (e.g. reductions in trade barriers or changes in exchange rate policies) that could alter the underlying relationships, but these changes cannot be captured by linear models that assume constant parameters over several decades. Also, most existing work has not done enough to distinguish long-run trends from short-run, cyclical relationships (with the notable exception of Barbosa-Filho and Taylor).

A deeper problem is that the search for a single characterization of each country as either wage-led or profit-led is misguided from a theoretical viewpoint. As this chapter makes clear, for any given country under a given set of behavioural parameters, shocks to different exogenous variables that affect distribution (such as the bargaining power of labour, the market power of oligopolistic firms or expectations about the exchange rate) are likely to have different effects on distribution and utilization. Thus, the same country could exhibit wage-led behaviour in response to one type of shock (e.g. reduced monopoly power of firms) and profit-led behaviour in response to another sort of shock (e.g. greater bargaining power of labour or the expectation of a real exchange rate depreciation). However, most studies to date have treated distribution as exogenous and have not paid adequate attention to the underlying causes of changes in distribution—although a few studies have found that currency depreciations generally lead to higher profit shares (e.g. Fernandez, 2005; Önanan, 2009).

Hence, future empirical research should perhaps focus more on identifying and estimating the various causal mechanisms through which distribution and demand interact, rather than seeking a unique characterization of each country as wage- or profit-led. Also, more micro-level studies are needed to test some of the underlying behavioural assumptions of these models, such as how mark-ups respond to interest rate and exchange rates.

8 Conclusions

The post-Keynesian emphasis on income distribution determined by mark-up pricing and on aggregate demand depending on income distribution yields many insights into open economy macroeconomics that cannot be observed in conventional models that ignore the distributional dimension. As one example, we saw that the effectiveness of a currency depreciation for either boosting output or improving the trade balance depends partly on the extent to which the depreciation redistributes income toward profits and also whether that redistribution is expansionary or contractionary for demand overall. In addition, incorporating the open economy dimension alters the results of closed economy post-Keynesian models, especially highlighting additional possibilities for utilization or growth to be profit-led even in countries where domestic demand is wage-led. Furthermore, the analysis in this chapter shows that the *source* of a distributional shift matters to its impact on an open economy, and the same country could exhibit wage-led or profit-led behaviour in response to changes in different exogenous factors (such as the market power of firms, bargaining power of labour and exchange rate expectations). This chapter also analysed the effects of interest rate increases in open economies, showing that their effects depend partly on whether mark-ups are interest-elastic or interest-inelastic and also whether financial markets are in a normal or crisis state. Finally, this chapter briefly reviewed empirical estimates of post-Keynesian models of distribution and growth for open economies and reflected upon some of the reasons why they have obtained rather conflicting results to date.

The analysis in this chapter is, nevertheless, quite preliminary in many respects. On the theoretical side, the models presented here have emphasized only flow relationships, and have not considered the cumulative impact of the flows on stocks of capital or financial assets (and the prices of these assets) over time. In order to obtain more complete dynamic results

and extend the analysis to longer-term relationships, it would be necessary to merge the analysis of distribution and growth developed here with something like the stock-flow consistent models of international finance that have been developed by Taylor (2004a) or Godley and Lavoie (2005–6). On the empirical front, while it is easy to identify weaknesses in the econometric estimates that have been done to date, it is important to recognize the pioneering contributions that the previous empirical studies have made, and it is not an easy task to improve upon that work. Developing more robust econometric frameworks, or perhaps employing simulation methods incorporating realistic behavioural parameters derived from other studies, will be essential for making further progress in the understanding of open economy macroeconomics from a post-Keynesian perspective.

Notes

¹ These features of the models derive more from the work of Kalecki (1954) than from Keynes (1936); hence these models are sometimes called “neo-Kaleckian” (e.g. by Blecker, 2002). Taylor (1983, 2004b) calls these models “structuralist” because they can be adapted to a variety of real-world situations, while others (e.g. Lavoie, 1992; Hein, 2008) refer to them as “post-Keynesian”. Needless to say, the label is less important than the content.

² The modelling framework and notation used here draw upon several previous sources, especially Blecker (1999, 2002), Dutt (1990), Lavoie (1992), Taylor (2004b) and Hein (2008).

³ The use of a one-sector framework prevents us from addressing certain open economy issues in this chapter, especially the role of imports of intermediate or capital goods. See Taylor (1983) for a neo-Kaleckian model incorporating imported intermediates and Cordero (2008) for a model with imported capital goods.

⁴ See Harris (1974) and Asimakopulos (1975) for neo-Kaleckian models incorporating overhead labour.

⁵ Gross profits (often referred to as the “operating surplus” of firms) include costs that must be deducted in calculating net profits, such as corporate income taxes, depreciation of fixed capital and interest on corporate debt. In this simple model, those subtractions from gross profits are not modeled explicitly (interest costs will be considered later in this chapter).

⁶ The labour coefficient a_0 is taken as exogenously given throughout, although it could be endogenized in a more complete model incorporating firms’ decisions about technological innovation (see, e.g. Taylor, 2004b; Dutt, 2006; Rada, 2007; Cordero, 2008).

⁷ Note we must assume that $u \leq 1/a_1$, where a_1 is the capital-output coefficient at full capacity utilization in chapter 3, above.

⁸ The distinction between retained profits of firms and interest paid to rentiers is a major focus of Hein (2008) and is covered in chapter 12 in this volume. This distinction, while theoretically and empirically important, is not modelled explicitly in this chapter in order to focus on the open economy dimension.

⁹ If workers do not save, we have the special case in which $\sigma = s_r \pi u = s_r r$.

¹⁰ Specific functional forms of (6) may have strong implications for the results of post-Keynesian macro models, as first noted by Marglin and Bhaduri (1990). See Blecker (2002) for a survey and discussion.

¹¹ The interest rate will be included in a modified version of this investment function later in this chapter.

¹² The inclusion of a profit measure can be justified in two ways. First, the current profit share can be considered an indicator of expected future profitability on the Keynesian assumption of myopic expectations. Second, profits provide the “retained earnings” or “cash flow” that can be used to relieve financial constraints on investment by financing it internally or leveraging external funds on more favourable terms.

¹³ In most theoretical and empirical literature on investment, a dynamic accelerator effect is preferred, i.e., investment depends on the growth rate of output (or sales), rather than on the

level of output relative to capacity or the capital stock. However, the simpler alternative of a static utilization effect is adopted here. Del Monte (1975) showed that the steady-state results of using a dynamic accelerator are qualitatively similar to those derived from a static accelerator.

¹⁴ See Mott and Slattery (1994a) and Blecker (2002) for neo-Kaleckian models with explicit taxation of wage and profit income at different rates, and Taylor (2004b) for models that emphasize the budget balance and fiscal policy. Godley and Lavoie (2005–6) analyse fiscal policy in an open economy model with consistent stock-flow accounting.

¹⁵ This specification implicitly assumes that home and foreign products are imperfect substitutes, and that exports are qualitatively the same as home products sold domestically.

¹⁶ M-L is the condition for a depreciation to improve the trade balance, assuming that prices are fixed in the sellers' currencies and holding output constant. A general version of this condition that allows for imbalanced trade is that $b_q > 0$ if and only if $|\eta\gamma + \nu| > 1$, where η and ν are the price elasticities of export and import demand, respectively, and γ is the ratio of the value of exports to the value of imports. Note that b_q is a partial derivative which holds distribution and utilization constant; the total effect of a depreciation also depends on what happens to u and π (or ψ), as will be analyzed later.

¹⁷ These derivatives are qualitatively equivalent to the effects of an increase in the mark-up rate z , given the monotonic positive relationship (2) between z and π .

¹⁸ Some of the earliest neo-Kaleckian macro models made special assumptions (for example, no saving out of wages, linear investment functions and closed economies) that together implied wage-led demand (or growth). Blecker (1989a) and Bhaduri and Marglin (1990) opened up the possibility of profit-led regimes in an open economy, while Marglin and Bhaduri (1990), Taylor (1990, 1991), and Mott and Slattery (1994b) demonstrated this possibility for closed economies by using more general investment or saving functions.

¹⁹ One could argue that the profitability effect is likely to be relatively stronger compared with the utilization effect in a country is open to foreign direct investment flows, especially where these are oriented toward export industries that don't depend on domestic demand.

²⁰ This label was used by Marglin and Bhaduri (1990), emphasizing the analogy to a conventional IS curve (goods-market clearing condition). Taylor (2004b) calls the same relationship the "output response" or "effective demand" curve.

²¹ This diagrammatic approach is suggested by the graphical analysis in Marglin and Bhaduri (1990). Their iso-growth curves are rectangular hyperbole because they assume $s_w = 0$ and a closed economy, in which case $g = s_r \pi u$, but these assumptions are not made here.

²² The straight lines shown for the IS and iso-growth curves in Figure 4.1 are linear approximations to the actual curves in the neighbourhood of the equilibria; the actual curves could be nonlinear.

²³ See, for example, Feenstra (1989), Blecker (1989a, 1989b), Arestis and Milberg (1993–94), and Önarar (2009), among many others. Clarida (1997) found that dollar appreciation had a significant negative effect on the level of profits in the US manufacturing sector, although he did not test for mark-ups or the profit share.

²⁴ Capital stocks are taken as given in the medium run, so we do not have to confront the question of whether utilization rates should be considered endogenous in the long run. See

the discussion of this debate in chapter 3 and the references given there.

²⁵ The origins of this approach are found in Weintraub (1958) and Rowthorn (1977). The presentation here incorporates elements from Dutt (1990), Lavoie (1992) and Taylor (2004b), adapted to the open economy setting by the author.

²⁶ For a country with a long history of depreciation-induced inflation and strong wage indexation, it would make sense to include a q term in the wage reaction function.

²⁷ The assumption that a flexible exchange rate does not “jump” instantly to “clear” the balance of payments and instead adjusts gradually toward an expected level can be justified by the recent theoretical work of Taylor (2004a) and Frydman and Goldberg (2007).

²⁸ In mainstream neoclassical models, exchange rates are supposed to be determined by so-called fundamentals such as money supplies and interest rates, often under assumptions such as purchasing power parity or uncovered interest parity. The poor predictive power of these fundamentals-based models has long been recognized (see Frankel and Rose 1995).

²⁹ The medium-run stability analysis is presented in the mathematical appendix, which is available on request.

³⁰ We focus on the wage-led domestic demand case here because it is of greater theoretical interest: since the open economy effects generally push the economy more in the profit-led direction, it is most interesting to see how they change the results when the domestic economy is wage-led rather than when it is profit-led to begin with.

³¹ Iso-growth curves are omitted to avoid cluttering the diagrams from this point forward. With ψ on the vertical axis, these curves would be upward-sloping with higher growth rates moving down toward the right and they could be either steeper or flatter than IS (when IS is upward sloping) so that both wage- and profit-led growth would be possible.

³² A complete mathematical solution of the model is available from the author on request.

³³ From (15'), it appears that a rise in \bar{q} has two offsetting effects on the inflation rate. On the one hand, a real depreciation has a positive direct effect on firms' price increases by inducing them to raise their target mark-ups. On the other hand, by reducing the equilibrium wage share, the depreciation indirectly reduces inflationary pressures by narrowing the gap between the actual wage share and the firms' target. The mathematical appendix demonstrates that the former effect necessarily dominates and $d\hat{P}/d\bar{q} > 0$.

³⁴ Although it might appear from the graph that the changes in these two variables are ambiguous, the mathematical appendix (available on request) demonstrates that both must increase.

³⁵ This is the case in an economy with wage-led domestic demand, as shown in Figure 4.4. With profit-led domestic demand, the outcome would be ambiguous.

³⁶ This point was originally made by Blecker (1989a), in a somewhat different modelling framework.

³⁷ For simplicity, we ignore a fourth possibility, which is that the interest rate could enter the saving function because rentiers save only part of their interest income while firms save all of their net profits (as in Hein, 2008, and chapter 12 below). To keep the model simple, we implicitly assume that both interest income and net profits are saved at the same rate s_r .

³⁸ Note that $\pi = 1 - \psi$ and u are still in the investment function since $r = \pi u$; animal spirits α are suppressed here for convenience. Since we are focusing on interest costs as reducing the net returns or cash flow to the firm and not as the cost of borrowed funds, we use the nominal interest rate and not the ‘real’ rate (nominal interest rate minus expected inflation rate).

³⁹ Although Hein (2008) does not include the debt-capital ratio δ in his mark-up function, it makes sense that the interest rate should be weighted by this ratio since firms are more likely to be concerned about passing interest costs on to customers when their debt burden is high.

⁴⁰ The specification of the exchange rate response to interest rate differentials in this section is admittedly unconventional and ad hoc. Many conventional models of exchange rates based on the “monetary approach” and “rational expectations” have the opposite implication that a rise in the interest rate differential generally causes the home currency to depreciate. These models usually assume either purchasing power parity or uncovered interest parity, and the empirical track record of these models is notoriously bad (see Frankel and Rose, 1995). Indeed, one of the “puzzles” in the literature is the frequent finding that a higher interest rate differential often leads to a currency appreciation. See Gourinchas and Tornell (2004) for one theoretical rationale for this finding.

⁴¹ See, for example, the “revisionist” view of the Asian financial crisis of 1997-98 in Furman and Stiglitz (1998). Most of the financial crises in emerging market nations, from Mexico in 1994-95 to Argentina in 2001-2, occurred in countries with fixed or pegged exchange rates, in which the present model (which assumes a freely floating rate) does not literally apply. Nevertheless, those countries did experience expectations of devaluations, which in turn led to speculative attacks that helped to force them off their pegs or to abandon their fixed rates, and massive depreciations then ensued.

⁴² Fernandez (2005, pp. 83-84 and Table 5.10) found no evidence for a structural break in his utilization equation for the US at any point in his sample period, but Barbosa-Filho and Taylor (2006, p. 406n20) found that there was a significant structural break in 1970.

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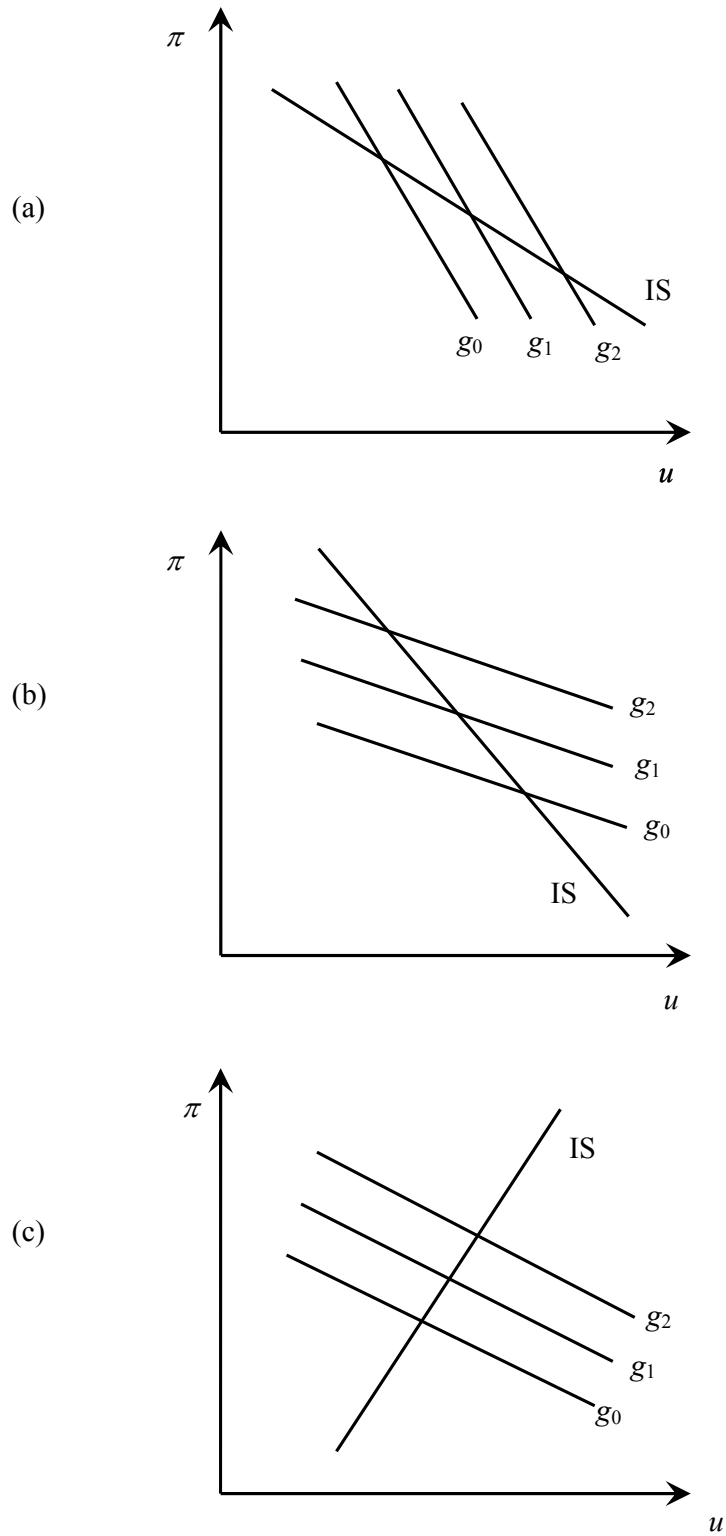


Figure 4.1 The goods market in the short run: (a) wage-led demand and wage-led growth; (b) wage-led demand and profit-led growth; (c) profit-led demand and profit-led growth

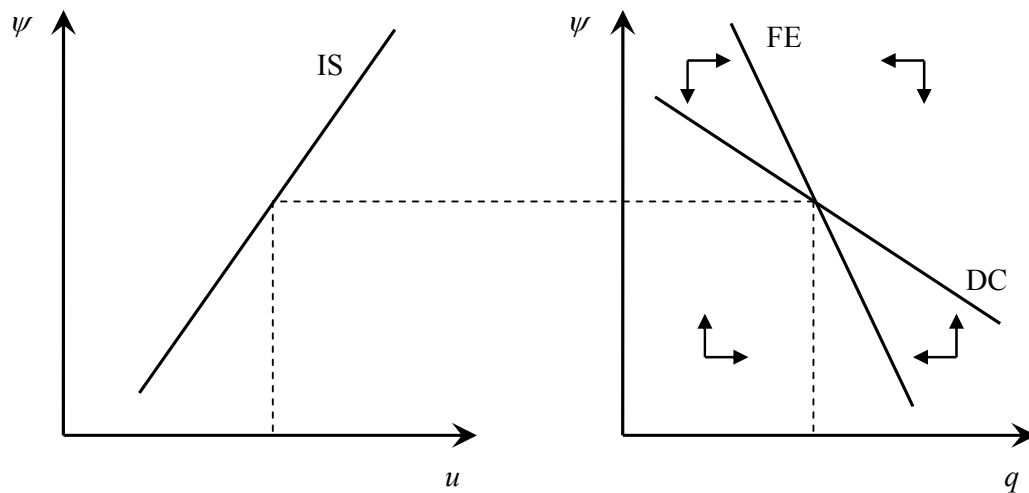


Figure 4.2 Medium-run equilibrium and dynamics

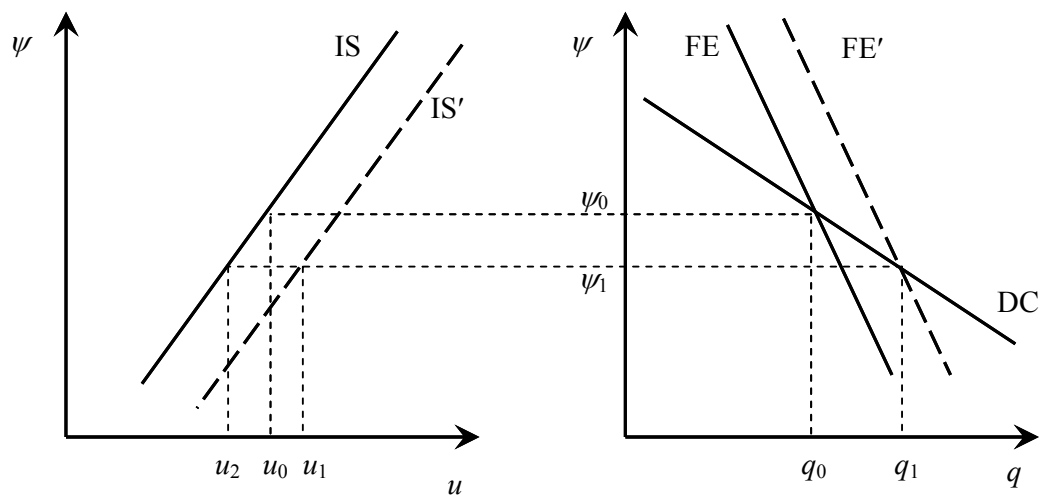


Figure 4.3 A currency depreciation with domestically wage-led demand (expansory versus contractionary cases)

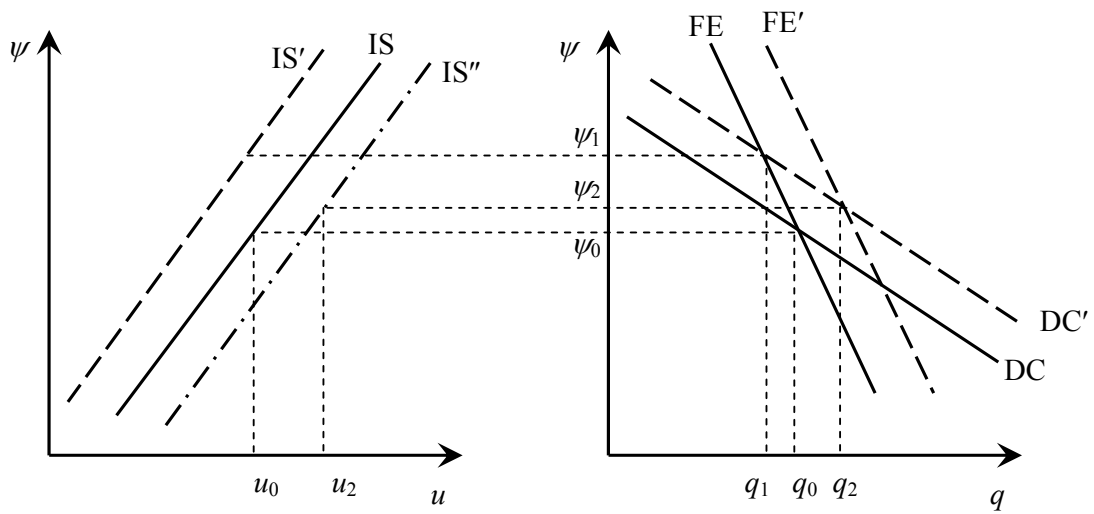


Figure 4.4 Increased bargaining power of labour (rise in ψ_w , only DC shifts) versus reduced monopoly power of firms (rise in τ , both DC and FE shift)

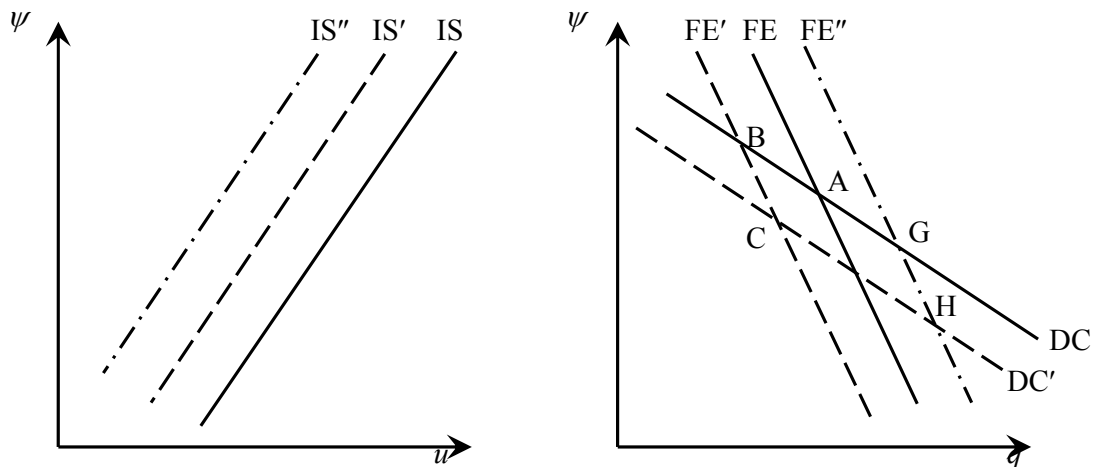


Figure 4.5 Possible shifts in curves due to an increase in the interest rate, showing normal (B or C) versus crisis (G or H) situations compared with initial equilibrium at A