Chapter 9

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: that the functional distribution of income between wages and profits is determined by the mark-up pricing decisions of industrial firms; and that aggregate demand depends in important ways on the functional distribution of income. 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 liberalisation, 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 emphasised differences between closed and open economies.

Adding open economy features alters the potential outcomes of post-Keynesian models in several important ways. 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.

In order to highlight how the open economy dimension affects the results, this chapter is organized as follows. Section 2 presents a short-run, static model of the goods market assuming a fixed exchange rate and given relative shares of wages and profits in national income. Section 3 then develops a dynamic model of conflicting claims inflation and a managed exchange rate, which solves for medium-run equilibrium levels of the wage share and real exchange rate. Thus, in this approach, open economy effects that operate via income distribution are found only in the medium-run dynamic analysis, not in the short-run model. This distinction is made for analytical clarity in isolating the open economy effects, although empirically open economy effects might also operate in a more short-run time frame. Section 4 applies this model to analyse the effects of a currency depreciation policy, while section 5 considers the impact of changes in the domestic determinants of income distribution (workers' bargaining power and the oligopoly power of firms). Section 6 surveys empirical estimates of post-Keynesian open economy models and section 7 concludes.

2. The short-run model of the goods market

The modelling framework used here draws upon several previous sources, especially Dutt (1990), Lavoie (1992), Blecker (1999, 2002), Taylor (2004b) and Hein (2008). This framework derives more from 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.

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. 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. 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,[1] 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 the dynamic model of inflation, distribution and the exchange rate in the next section. The

labour coefficient a_0 is taken as exogenously given throughout, although it could be made endogenous in a more complete model incorporating firms' decisions about technological innovation (as, for example, in Taylor, 2004b; Dutt, 2006; Rada, 2007; Cordero, 2008).

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

$$\psi = \frac{1}{1+z}, \tag{2}$$

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

$$r = \frac{(P - Wa_0)Y}{PK} = (1-\psi)u, \tag{3}$$

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 utilisation.[2] In this model, the real wage can be expressed in any of the following ways:

$$w = \frac{W}{P} = \frac{1}{a_0(1+z)} = \frac{\psi}{a_0}. \tag{4}$$

That is, the real wage is positively related to the productivity of labour ($1/a_0$) and inversely related to the mark-up rate z. The real wage can also be expressed as the wage share ψ divided by the labour coefficient a_0. 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: 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 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.[3] Defining the ratio of saving to the capital stock as $\sigma = S/K$, the saving function can be written as

$$\sigma = [s_r(1-\psi) + s_w\psi]u\,, \tag{5}$$

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

Following Marglin and Bhaduri (1990) and Taylor (2004b), we use the most general (implicit) form of a neo-Kaleckian investment function:[4]

$$g = f(\pi, u, \alpha)\,, \qquad f_\pi, f_u, f_\alpha > 0\,, \tag{6}$$

where $g = I/K$ is the ratio of investment to capital, $\pi = 1 - \psi$ is the profit share, and α is a shift parameter. This function thus captures three of the most fundamental determinants of investment: profitability (represented here by the profit share),[5] aggregate demand (utilisation of existing capacity)[6] and the state of business confidence (Keynes's 'animal spirits', represented by α).

The government sector is omitted for simplicity.[7] The trade balance (in real terms, measured as a ratio to the capital stock) can be written as the implicit function

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

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 utilisation rate (in obvious notation, $u^* = Y^*/K^*$).[8] 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 domestic goods.[9] We will generally assume that the Marshall-Lerner (M-L) condition holds so that $b_q > 0$, but will also consider the consequences if M-L is violated.[10]

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:

$$\sigma = g + b. \tag{8}$$

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), (7) and the definition of π into (8) and rearranging, we obtain the following implicit solution for goods market equilibrium (that is, u as an implicit function of ψ, α, s_w, s_r, q and u^*):

$$[(s_r - s_w)(1-\psi) + s_w]u = f(1-\psi, u, \alpha) + b(q, u, u^*). \tag{9}$$

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

$$EDG = g + b - \sigma = f(1-\psi, u, \alpha) + b(q, u, u^*) - [(s_r - s_w)(1-\psi) + s_w]u. \tag{10}$$

Thus, the short-run stability condition is

$$\frac{\partial EDG}{\partial u} = f_u + b_u - [(s_r - s_w)(1-\psi) + s_w] < 0, \tag{11}$$

or $(s_r - s_w)(1 - \psi) + s_w - b_u - f_u > 0$. Intuitively, this means that total 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 utilisation, so that excess demand is eliminated rather than exacerbated by increases in utilisation. Recalling that $b_u < 0$, the openness of a country to trade has a stabilising impact because higher domestic utilisation (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 implicit or general functions, we cannot obtain an explicit solution of (9) for u. However, it is easy to find the slope of the equilibrium relationship described by (9), taking the mark-up z or (equivalently) the wage share ψ as given in the short run. Totally differentiating (9) with respect to u and ψ, we obtain:

$$\frac{du}{d\psi} = \frac{(s_r - s_w)u - f_\pi}{(s_r - s_w)(1-\psi) + s_w - f_u - b_u}. \tag{12}$$

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 positive ($du/d\psi > 0$), and is 'exhilarationist' or has 'profit-led demand' when it is negative ($du/d\psi < 0$).[11] 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. 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. 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 (1994a) demonstrated this possibility for closed economies by using more general investment or saving

functions (see Blecker, 2002, for a survey).

We are interested in the effects of a change in income distribution on growth (capital accumulation) as well as on utilisation. Differentiating (6) with respect to ψ (recalling that $\pi = 1 - \psi$) and using (12), we obtain the total derivative

$$\frac{dg}{d\psi} = \frac{(s_r - s_w)[f_u u - f_\pi(1-\psi)] - f_\pi(s_w - b_u)}{(s_r - s_w)(1-\psi) + s_w - f_u - b_u}, \tag{13}$$

which has a positive denominator (by the stability condition) and an ambiguously signed numerator. A relatively large utilisation effect on investment (f_u) combined with a relatively high saving rate out of profits (s_r) makes growth more likely to be wage-led ($dg/d\psi > 0$); a relatively large profitability effect on investment (f_π), 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 ($dg/d\psi < 0$).[12]

<Figure 4.1 around 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',[13] the slope of which is given by (12). Upward-sloping IS curves (top two panels) indicate wage-led demand, while a downward-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).[14] Totally differentiating (6) and setting $dg = 0$ (again recalling $\pi = 1 - \psi$ and holding α constant), the slopes of these curves are given by $\partial\psi/\partial u = f_u/f_\pi > 0$, which describes upward-sloping curves that may be either steeper or flatter than IS when the latter also is upward-sloping.[15] In Figure 4.1, moving from lower to higher wage shares, we see that in

panel (a) the growth rate increases along with the utilisation rate, while in (b) the growth rate falls even though the utilisation rate is rising, and in (c) both the utilisation and growth rates decrease. Thus, profit-led demand (panel c) always corresponds to profit-led growth, while wage-led demand can occur with either wage-led or profit-led growth (panels a and b, respectively).

The preceding analysis pertains to a short-run situation in which the exchange rate and mark-up (or wage share) are 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 (see, for example, Feenstra, 1989; Blecker, 1989a, 1989b; Arestis and Milberg, 1993–94; and Onaran, 2009).[16] 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 the wage share via (2). 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 a managed exchange rate

In the short-run model, we took nominal wages W, the mark-up rate z and the nominal exchange rate E as exogenously given (and, therefore, the price level P, wage share ψ 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, prices and mark-ups to change in response to conditions

affecting workers' bargaining power and firms' pricing decisions, while the real exchange rate would be likely to vary depending on differences between domestic and foreign inflation rates as well as changes in the nominal exchange rate. We call the time period in which wages, prices, distribution and exchange rates adjust the 'medium run', and define the medium-run equilibrium as a steady state in which ψ and q reach constant levels determined by the underlying structural parameters.[17]

To explain changes in wages, prices and distributive shares, post-Keynesian economists have developed the 'conflicting claims' approach to inflation and income distribution. The origins of this approach are found in Weintraub (1958) and Rowthorn (1977); the presentation here incorporates elements from Dutt (1990), Lavoie (1992), Blecker (1999) and Taylor (2004b). In this framework, workers and firms are assumed to 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 utilisation). 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 discussed in chapter 3. We assume as a first step that workers and firms set nominal wages and prices (respectively) according to the following simple 'reaction functions':

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

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

where a '^' over a variable indicates an instantaneous rate of change. Workers are assumed to target the wage share ψ_w, which implies a real wage that grows at the same rate as labour productivity (which for simplicity we assume rises at the exogenous rate $-\hat{a}_0 = \varepsilon > 0$). 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, we first 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

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

Second, we recognize that wage setting can also be influenced by the real exchange rate. If there is a real depreciation (a rise in q), the cost of imported workers' consumption goods rises, and while we don't model this effect explicitly we can incorporate it by assuming that workers demand higher nominal wage increases in response. Thus the wage reaction function (14) becomes

$$\hat{W} = \phi(\psi_w - \psi) + \gamma q \qquad (14')$$

where it is assumed that the real exchange rate does not affect the workers' target wage share but rather influences the degree to which nominal wage increases respond to gaps between any given target ψ_f and the actual ψ. The parameter γ will be relatively large in countries where imports of wage goods are important and labour unions are strong, and low otherwise.[18]

To model nominal exchange rate adjustments, we use a specification that makes the most sense if interpreted as a managed exchange rate of the 'crawling peg' variety:[19]

$$\hat{E} = \mu(\overline{q} - q) \,. \qquad (16)$$

In this equation, $\overline{q}$ represents the monetary authority's medium-run target for the real exchange rate, while μ is the speed of adjustment with which the nominal exchange rate is adjusted to achieve that target.[20] Importantly, $\overline{q}$ need not correspond to any conventional view of a long-run equilibrium real exchange rate, such as one determined by purchasing power parity, but is simply the target set by the monetary authorities.

To find the medium-run solution, 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:

$$\hat{\psi} = \hat{W} + \hat{a}_0 - \hat{P} \tag{17}$$

$$\hat{q} = \hat{E} + \hat{P}^* - \hat{P}\,. \tag{18}$$

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

$$\hat{\psi} = \phi(\psi_w - \psi) + \gamma q - \varepsilon - \theta(\psi - \tau + \beta q) \tag{17′}$$

$$\hat{q} = \mu(\overline{q} - q) + p^* - \theta(\psi - \tau + \beta q)\,, \tag{18′}$$

where we use $-\hat{a} = \varepsilon$ 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

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

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

<Figure 4.2 around here>

The two possible configurations of these curves are shown in Figure 4.2, where $\hat{\psi} = 0$ (equation 19) is labeled as 'DC' (distributive curve) and $\hat{q} = 0$ (equation 20) is labeled 'FE' (foreign exchange curve). The FE curve is always downward-sloping, but DC can slope either upward (if $\gamma > \theta\beta$) or downward (if $\gamma < \theta\beta$). However, DC is always flatter than FE when both are downward-sloping, and the steady-state equilibrium point at which the two curves intersect (where $\hat{\psi} = \hat{q} = 0$) is always stable in either of the two possible configurations.[21] However, we consider that the upward-sloping DC curve in panel (a) of Figure 4.2 would rarely be found in reality, since it would imply that a currency depreciation (rightward shift in FE) would cause the medium-run equilibrium wage share to rise; this would require an extremely large response of wages to the depreciation (which might be observed only in countries with very strong labour

unions and indexed wages). Much more commonly, currency depreciations tend to reduce real wages and the wage share. Therefore, in what follows we focus on the case of the downward-sloping DC curve shown in panel (b) of Figure 4.2.

<Figure 4.3 around here>

Figure 4.3 combines the FE-DC diagram assuming a downward-sloping DC curve with an upward-sloping IS curve assuming wage-led (domestic) demand. On the assumption that output adjusts faster than wages, prices and the exchange rate, the economy must be on the IS curve at all times. We focus on the wage-led domestic demand case (upward-sloping IS) here because it is of greater theoretical interest: since the open economy effects generally push the economy more in the profit-led direction, as will be seen below, it is most interesting to see how they change the results when domestic demand is wage-led rather than when it is profit-led. The intersection of the FE and DC curves 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). Iso-growth curves are omitted to avoid cluttering the diagrams from this point forward. Substitution of the equilibrium solutions for q and ψ into (15′) then yields (after much simplification) the reduced form solution for the equilibrium inflation rate

$$\hat{P} = \frac{\theta[\mu(\phi\psi_w - \varepsilon) - \mu\phi\tau + (\gamma + \phi\beta)(\mu\bar{q} + p^*)]}{\mu(\phi + \theta) + \theta(\gamma + \phi\beta)}. \qquad (21)$$

4. Exchange rates and income distribution

If the monetary authorities decide to seek a lower target real value for the home currency, they

would set a higher value for the target real exchange rate $\bar{q}$. As shown in the right panel of Figure 4.3, a rise in $\bar{q}$ shifts the FE curve to the right to FE′; 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).

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:

$$\frac{du}{dq} = \frac{b_q}{(s_r - s_w)(1-\psi) + s_w - f_u - b_u} \quad . \tag{22}$$

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 comparative static effect of the rise in q holds the wage share 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 in the short run 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). 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 (utilisation) 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 in this model,[22] a depreciation must be expansionary for output but is likely to be less 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 (rise in $\overline{q}$) on inflation is unambiguously positive per equation (21).

5. Distribution and demand in open economies

A real depreciation caused by a change in the exchange rate target of the monetary authority is only one of several possible causes of simultaneous changes in distribution and utilisation in an open economy, and changes in domestic wages and prices can also influence the real exchange rate. As this section will show, the conditions that determine whether demand is wage- or profit-led overall (including open economy effects) vary considerably depending on the source of the change in distribution, and hence it is not possible to give a unique characterisation 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), as shown in Figure 4.4. In addition, the IS curve shifts leftward to IS′ as the currency appreciation worsens the trade balance (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 higher is the trade share of output, the more likely it is that the overall impact would be negative (and conversely).

<Figure 4.4 around here>

Now, consider instead a reduction in the oligopoly power of domestic firms (for example, because of stronger competition policies or reduced entry barriers), which raises the shift parameter τ in equation (15′). 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. 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).[23] 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.[24]

Furthermore, as shown in the previous section, a redistribution toward wages that results from a change in the exchange rate target of the monetary authorities can be associated with either an expansion or contraction of output under yet different conditions. Hence, an economy characterised by the same underlying structural parameters may 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.

6. 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 necessarily brief, and hence omits many important details. The intention is simply to assess the current state of the literature and 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 utilisation (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 and the latter with the overall results including changes in net exports. The second type of study, which does not disaggregate output (or utilisation) 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 utilisation 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 et al. (2009) found that the Euro area as a whole (12 countries) 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. Hein and Vogel's result for Austria is also confirmed by Stockhammer and Ederer (2008), while Stockhammer et al. (2010) find a similar result to Hein and Vogel's for Germany. Using an especially careful methodology to estimate open economy effects and how these have changed over time, Stockhammer et al. (2010) find that the open economy effects reduce the extent to which German demand is wage-led, but do not switch it to being profit-led 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). The finding that small open economies like Austria and the Netherlands are profit-led overall (Hein and Vogel, 2008) corresponds to theoretical expectations, as do the findings that the entire Euro area (a very large and relatively closed economy) is wage-led (Stockhammer et al., 2009) and that the large German economy remains slightly wage-led overall (Stockhammer et al., 2010). 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, though not necessarily invalid.

Turning to aggregative models, Stockhammer and Onaran (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 utilisation. Fernandez (2005) estimated a simultaneous equations model for capacity utilisation and the profit share in the US economy, using instrumental variables methods, for the period 1955-2004. He found that the profit share had a significant positive effect on the utilisation 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, and that the wage share was generally an increasing function of utilisation. However, Stockhammer and Stehrer (2009) find that Barbosa-Filho and Taylor's profit-led result is very sensitive to the lag length they used, and that US demand (utilisation) is wage-led using longer lags. Onaran and Stockhammer (2005) estimated

VAR models for Turkey and South Korea, and found some 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. 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. Thus far, only a few studies have tested for structural breaks, including Barbosa-Filho and Taylor (2006), Fernandez (2005) and Stockhammer et al. (2010), with varying results.

A deeper problem is that the search for a single characterisation of each country as either wage-led or profit-led may be 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 the target real exchange rate of the monetary authorities) are likely to have different effects on distribution and utilisation. 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 an exchange rate depreciation policy). 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; Onaran, 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 characterisation of each country as wage- or profit-led.

7. 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 (or possibly, though less likely, toward wages) 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 utilisation 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 policy). 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 emphasised 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 demand developed here with something like the stock-flow consistent models of international finance that have been developed, for example, 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 recognise the pioneering contributions that the existing 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] Gross profits 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 modelled explicitly.

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

[3] 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 is not modelled explicitly in the present chapter given the focus on the open economy dimension.

[4] 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.

[5] 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.

[6] 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 utilisation 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.

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

[8] This specification implicitly assumes that the ratio of home to foreign capital stocks, K/K^*, is constant, which is appropriate since this ratio would not vary appreciably in the short- or medium-run time frames considered in this chapter.

[9] This specification implicitly assumes that domestic and foreign products are imperfect substitutes, and that exports are qualitatively the same as domestic goods.

[10] M-L is the condition for a depreciation to improve the trade balance, assuming that prices are fixed in the sellers' currencies. A general version of this condition that allows for imbalanced trade is that $b_q > 0$ if and only if $|\eta\lambda + \upsilon| > 1$, where η and υ are the price elasticities of export and import demand, respectively, and λ is the ratio of the value of exports to the value of imports. Note that b_q is a partial derivative that holds distribution and utilisation constant; the total effect of a depreciation also depends on what happens to ψ, which will be analysed later.

[11] The terms 'stagnationist' and 'exhilarationist' refer to the effects of a redistribution of income toward profits, which are contractionary for wage-led demand and expansionary for profit-led growth. However, these terms may be confusing, since a 'stagnationist' economy need not be stagnant (it could be booming, if wages are high) while an 'exhilarationist' economy could be stagnant (if profits are low). Therefore, the more descriptive terms 'wage-led' and 'profit-led' are preferred.

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

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

[14] This diagrammatic approach is suggested by the graphical analysis in Marglin and Bhaduri (1990), although the latter make the simplifying assumptions of no saving out of wages and a closed economy.

[15] 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.

[16] 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.

[17] Capital stocks are taken as given in the medium run, so we do not have to confront the question of whether utilisation rates should be considered endogenous in the long run. See the discussion of this debate in chapter 3 of this volume and the references given there.

[18] Irrespective of the value of γ (and even if it is zero), there is also an indirect effect of a depreciation on wages: to the extent that the depreciation allows firms to raise mark-ups and thereby reduces the wage share, nominal wages will rise faster in response to the greater gap between the workers' target ψ_w and the actual ψ.

[19] One could possibly think of equation (16) as representing 'long swings' in a flexible exchange rate, where $\overline{q}$ would represent the expected real exchange rate in the medium run and the actual nominal rate would drift toward that expected level gradually, perhaps because of fundamental (Keynesian-Knightian) uncertainty about the medium-run expectations (see Frydman and Goldberg, 2007). However, this would admittedly be an unusual specification of a flexible rate, as it would not permit that rate to vary in the short run. Further work on how to integrate flexible exchange rates into this framework is therefore left for future research.

[20] We assume that the central bank automatically sterilizes any reserve inflows or outflows that are necessary to manage the nominal exchange rate so that the money supply and interest rates are unaffected.

[21] The stability analysis and all other mathematical results for the medium-run dynamic model of inflation, distribution and the real exchange rate are presented in an unpublished mathematical appendix, which is available from the author at blecker@american.edu.

[22] Note, however, that this model ignores other factors that could make a depreciation contractionary even in a profit-led economy, such as balance sheet effects in a country with foreign currency-denominated debt.

[23] 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.

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

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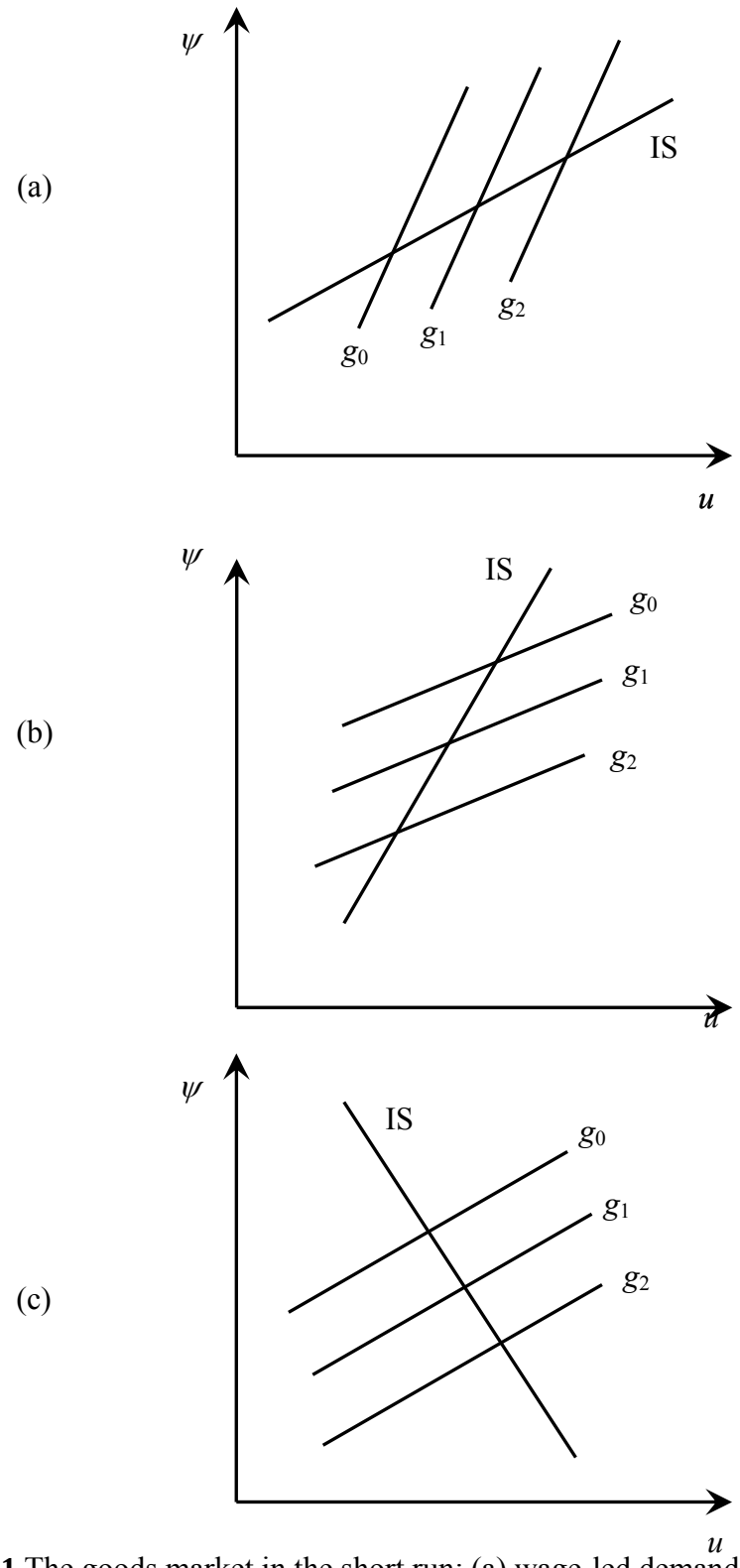

Figure 4.1 The goods market in the short run: (a) wage-led demand and wage-led growth; (b) wage-led demand and profit-led growth; (c) profit-led demand and profit-led growth

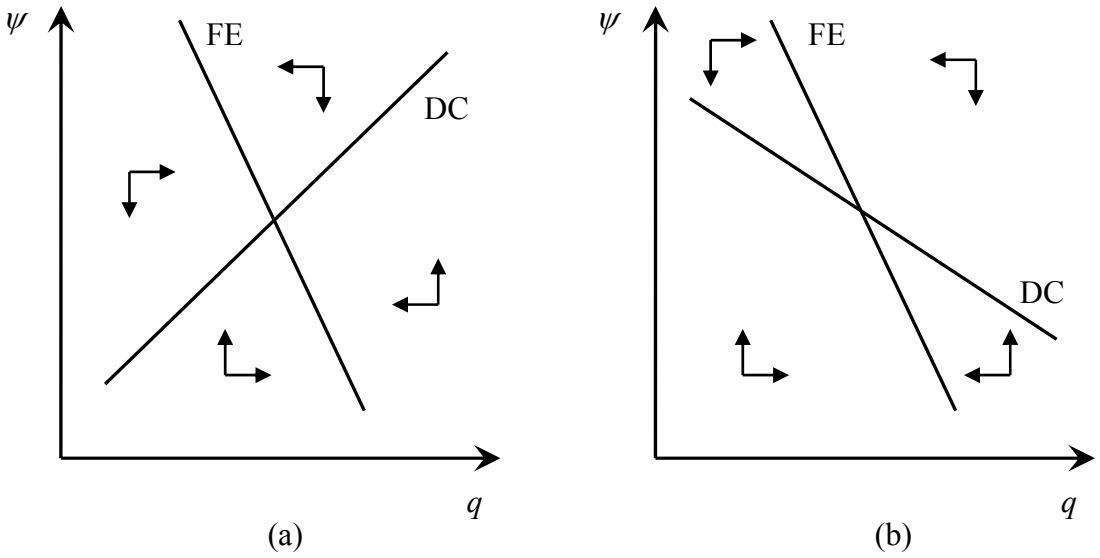

Figure 4.2 Medium-run equilibrium and dynamics with: (a) upward-sloping DC curve ($\gamma > \theta\beta$) and (b) downward-sloping DC curve ($\gamma < \theta\beta$)

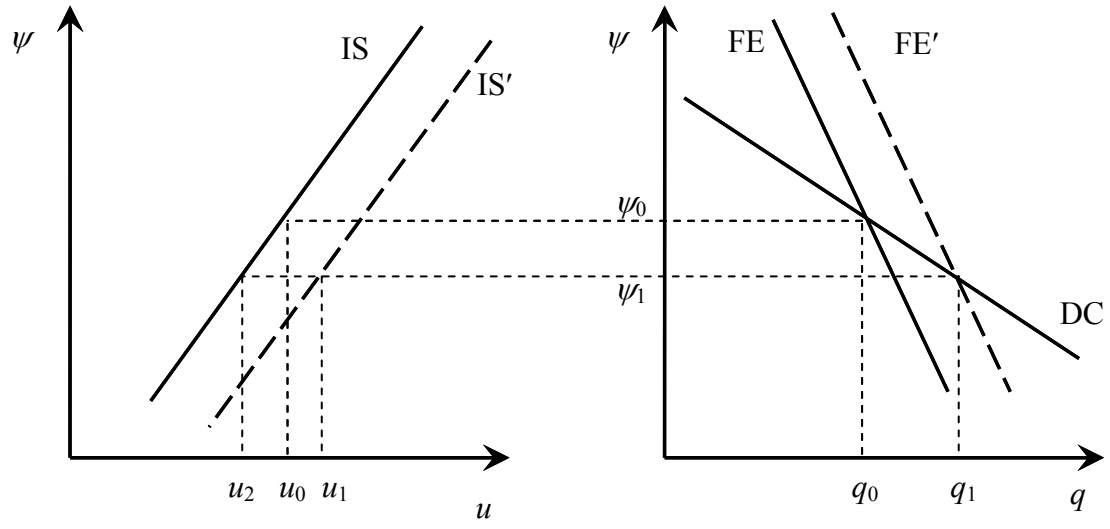

Figure 4.3 A currency depreciation (rise in $\bar{q}$) with domestically wage-led demand (expansionary versus contractionary cases)

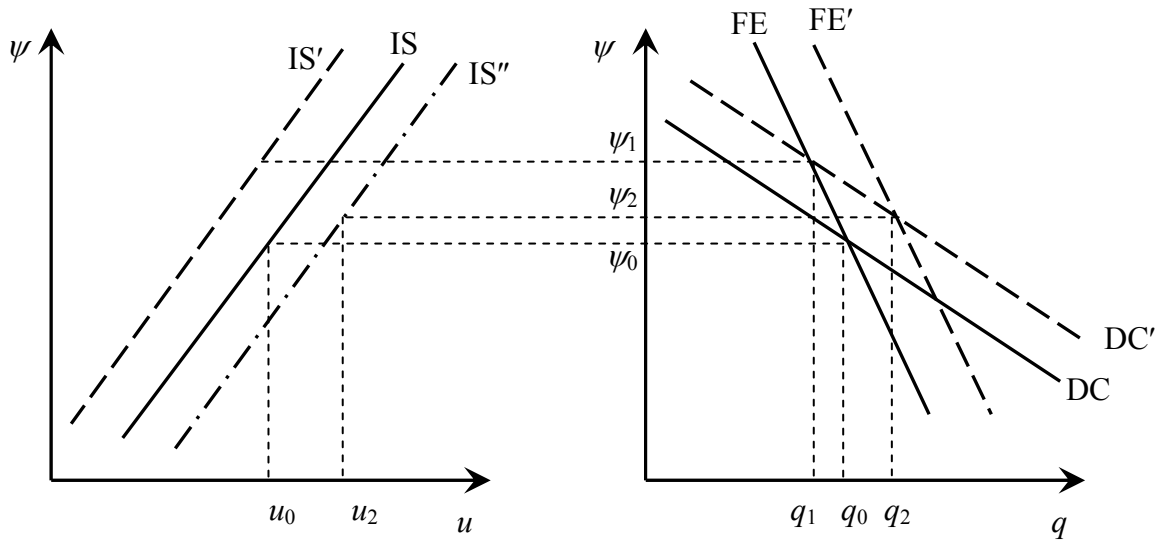

Figure 4.4 Increased bargaining power of labour (rise in ψ_w, only DC shifts) versus reduced oligopoly power of firms (rise in τ, both DC and FE shift)