8

Labor Market Dynamics within Rival Macroeconomic Frameworks

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Introduction

This chapter develops a simple framework within which one can analyze alternative macroeconomic approaches to labor market dynamics. By *dynamics* I mean both disequilibrium dynamics and growth dynamics. The former is the foundational level, at which real wages and employment respond to labor market imbalances of some sort. The latter extends the analysis to the case of growth. We will consider the basic neoclassical, Keynesian, Harrodian, and Marx–Goodwin models, each of which embodies a particular approach to macroeconomics. Although we will highlight several interesting properties of each approach, one particularly striking finding is that the standard formulation within all four approaches implies that social factors have no influence on the long-run equilibrium ratio of profits to wages (rate of surplus value). In the neoclassical case, this is instanced by the ubiquitous Cobb–Douglas production function, in which the profit–wage ratio is determined entirely by production parameters. In the standard Keynesian case, the corresponding outcome arises from markup pricing, in which changes in money wages cause equiproportional price changes, thereby leaving the real wage unchanged (and indeed implicitly unchangeable). And in Harrod and Marx–Goodwin, the result arises from the fact that a stable unemployment rate requires a unique profit–wage ratio which is completely independent of labor strength. Indeed, in Goodwin's formalization of Marx, greater worker strength arising from "class struggle" over wages has *no* effect on the rate of surplus value. Instead, it serves only to *increase* the long-run equilibrium rate of unemployment. Yet, despite its apparent generality, this result is easily overturned by an apparently minor modification. For if, as Marx argued, shortages of labor directly influence the rate of mechanization, then there turns out to be plenty of room for the influence of social forces on the wage share.

It is possible to detail all of these arguments within a fairly simple general framework. Let N = labor supply and L = employment either in the sense of planned labor demand (in neoclassical economics) or in the sense of actual labor employed. Then

$$v = L/N \tag{1}$$

is the virtual relative demand for labor (neoclassical) or the actual employment rate.

If Y = actual output and $y = Y/L$ = the productivity of labor, and K = the capital stock and $k = K/L$ = the capital labor ratio, then we may write employment as $L = Y/y = K/k$. This allows us to define v in two further alternative forms that prove useful in the analysis of growth dynamics. It is worth noting that when v represents the relative demand for labor, as in neoclassical economics, it can be less than, equal to, or greater than 1. In this context, $v-1$ would then represent the (positive or negative) *excess* demand for labor. But in the Keynesian, Harrodian, and Marxian frameworks, v represents the ratio of actual employment to labor supply, so that it must be less than or equal to 1 since employment cannot exceed labor supply. From this latter point of view, $1-v$ would represent the actual unemployment rate.

$$v = K/(kN) = Y/(yN) \tag{1a}$$

The second set of expressions for v makes it clear that population growth (which steadily raises N) and technical change (which tends to raise k and y) must be countered by growth in K and Y if the employment rate is to stay within bounds.

Finally, let W = the nominal wage, P = the price level, and w = the real wage $= W/P$.[1] Then

$$u = w/y = \text{the wage share.} \tag{2}$$

The expressions for the employment ratio v and the wage u comprise our basic framework, which is patterned after Goodwin (1967). We now apply it to the dynamics of the various models of the labor market. Since profit share = $(1-u)$ and the profit–wage ratio = $(1-u)/u$, it is sufficient to focus on the wage share alone.

Labor Market Dynamics within Standard Neoclassical Macroeconomics

The central feature of the neoclassical approach to the labor market is the contention that both labor demand L and labor supply N depend *solely* on the real wage w: $L = L(w)$ and $N = N(w)$, with derivatives $L' < 0$ and $N' > 0$. This means that labor demand decreases, and labor supply increases, as the real wage increases. Thus, within the competitive neoclassical model (we begin with the static case, in which there is no population growth and no technical change),

$$v = f(w),\ f' < 0, \tag{3}$$

that is, the virtual excess demand for labor decreases as the real wage increases. For the sake of illustration only, we will assume that v is a simple linear function of w.[2]

$$v = a - bw, \text{ where } a > 1,\ b > 0.^{3} \tag{3a}$$

Neoclassical economics conceives of the real wage as a price which under competitive conditions moves to automatically clear the labor market, that is, to automatically bring the system to the point where $v = 1$. Suppose that there is initially an excess demand for labor, so that $v > 1$. Then for this excess demand to be eliminated, the real wage must rise. Moreover, this rise must continue until $v = 1$, at which point it must stop. In other words, within neoclassical economics, stability in the labor market requires that

$$w' = h(x), \text{ where } x = v-1, \text{ and } h' > 0, \tag{4}$$

that is, real wages rise when $v > 1$, and fall when $v < 1$.

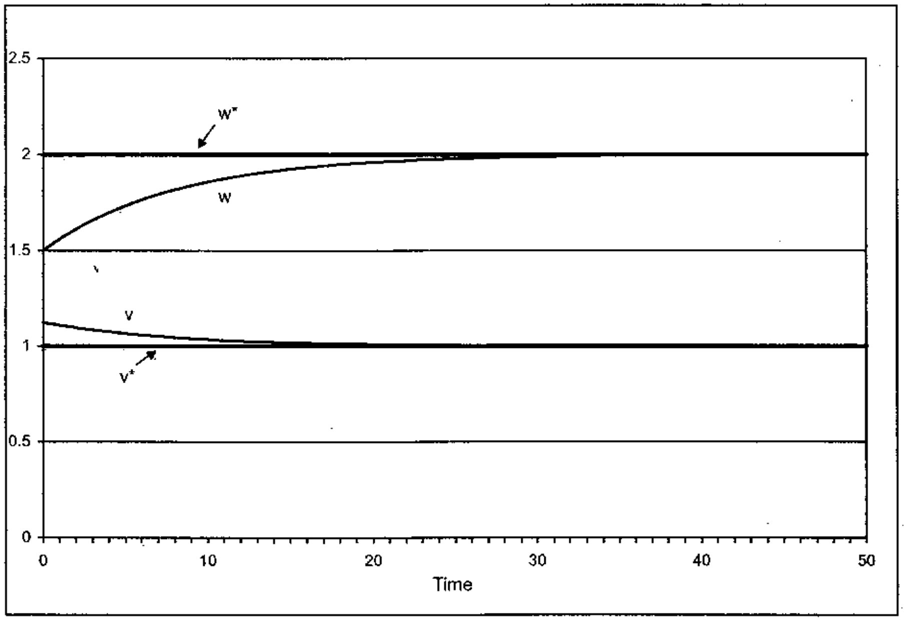
Equations (3)–(4) ensure that full employment is the only equilibrium point of the neoclassical labor market. But it is important to understand that the existence of a stable full-employment equilibrium does not imply that the system will actually *be* at full employment. It is perfectly possible that the system will fluctuate endlessly around full employment, possibly with great swings. To see this, consider the difference between following two wage reaction functions, both of which satisfy the general functional form in equation (4). The first case implies that real wages rise in direct proportion to the current excess demand for labor $(v-1)$. The second implies that they rise in response to the cumulative excess demand for labor $(\int(v-1))$.

$$w' = k(v-1) \tag{4a}$$
$$w' = k[\int(v-1)] \tag{4b}$$

If we combine the first real-wage adjustment function, equation (4a), with the employment rate function in equation (3a), we get

$$w' = a_1 - b_1 w, \text{ where } a_1 = k(a-1) > 0, \text{ and } b_1 = kb > 0. \tag{5a}$$

Figure 8.1 **Monotonic Convergence in the Neoclassical Labor Market**



This simple linear first-order system is monotonically stable around $w^* = a_1/b_1$, which from equation (3a) implies $v^* = a - bw^* = a - b(a_1/b_1) = a - b[k(a - 1)/kb] = 1$ (full employment).[4] Figure 8.1 illustrates the adjustment process from an initial state of excess demand.

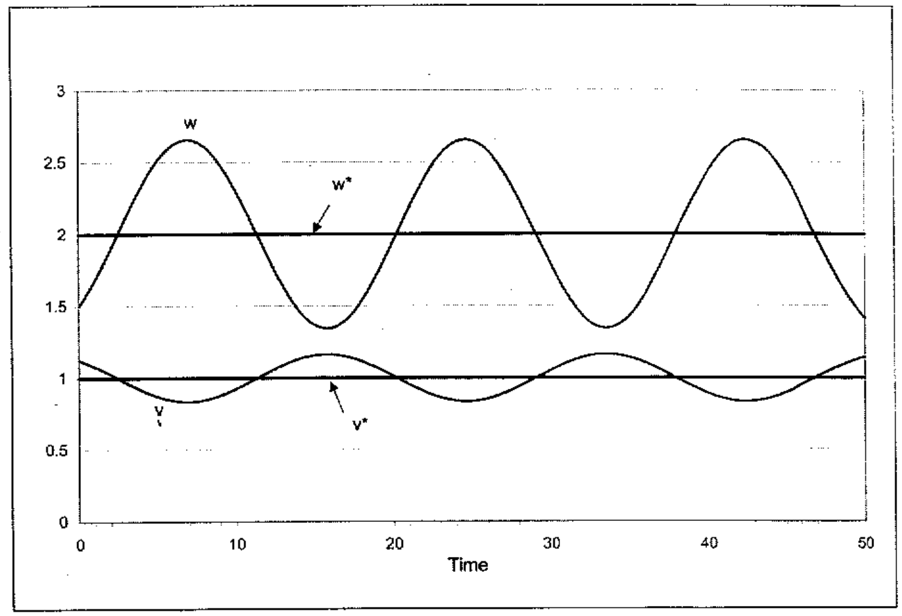
But when we instead use the second wage adjustment function, equation (4b), we get quite a different picture. Differentiating equation (4b) and substituting it into equation (3a) gives

$$w'' = a_1 - b_1 w, \text{ where } a_1, b_1 \text{ are as defined previously} \tag{5b}$$

Equation (5b) also has an equilibrium at $w^* = a_1/b_1$ and $v^* = 1$ (full employment). This particular dynamic equation is known as a harmonic oscillator (Hirsch and Smale 1974: 15), and it has the property that the actual levels of w and v oscillate endlessly around their equilibrium values with possibly substantial fluctuations. Figure 8.2 illustrates this second adjustment process. As we can see, the mere existence of a full-employment equilibrium does not imply that the system will come to rest at this point. It may instead over- and undershoot it endlessly.[5]

The foregoing brings out two critical features of the static neoclassical labor market story. First of all, the assumption that the real wage responds *solely* to the

Figure 8.2 **Harmonic Oscillation in the Neoclassical Labor Market**



excess demand for labor, as in equations (4a)–(4b), implies that the real wage is represented solely as a market-clearing price, not a socially determined variable.[6] Second, in this formulation the ***equilibrium*** real wage is independent of social forces. It is determined solely by the technology (through the marginal productivity of labor, which determines labor demand) and by exogenously given household preferences about work and leisure (which determine the supply of labor). It is of course true that the interventions of unions and of the welfare state may push the real wage above its putative equilibrium level, thereby giving rise to unemployment. But these would be disequilibrium phenomena. The equilibrium real wage and employment levels are purely psychotechnical. The equilibrium level of employment in turn determines a particular level of output, and hence productivity of labor, via the aggregate production function (Godley and Shaikh 2002: 426–28). It follows that the wage share, the ratio of the real wage to productivity, is determined entirely by technical and psychological structures. There is no room for unions and the state within this story, except of course to prevent equilibration.[7] This is most obvious in the ubiquitous Cobb–Douglas production function, in which the equilibrium wage share is equal to the labor elasticity parameter of the production function.[8]

Neoclassical growth dynamics extends this story to allow for population growth and technical change. The labor market is assumed to be in equilibrium at all times, but now the real wage, productivity, and the capital–labor ratio all grow in response to population growth and technical change. These latter factors now also influence the equilibrium levels of the real wage and wage share, but once again they are determined independently of any direct struggle over wages. In the case of an aggregate Cobb–Douglas production function undergoing neutral technical change, the wage share continues to be directly determined by the function's labor parameter, which is independent of social forces (although it may change as technology changes). Nonetheless, we have seen that the existence of a stable equilibrium does not imply that the wages, productivity, the capital–labor ratio, and even the wage share are actually *at* their equilibrium values. Quite independently of any social forces, the internal dynamics of the adjustment process may lead them to fluctuate endlessly around their equilibrium values. *Thus even within the internal logic of the neoclassical representation of the labor market, we cannot thereby take observed values of variables to be the same as equilibrium values.*[9]

Labor Market Dynamics within Standard Keynesian Macroeconomics

Within the standard Keynesian model, the variable v stands for the employment rate (the ratio of actual employment to available labor), and $1-v$ represents the unemployment rate. The basic argument is best approached by combining the expressions in equations (1) and (2) as

$$v = L/N = Y/(yN) < 1. \tag{2a}$$

In the static case, productivity y and labor supply N are given, so the employment rate varies solely with output Y. This in turn is said to be directly determined by demand Z, which in the simplest case is a multiple of autonomous demand $A = I + G$ = investment + government spending.

$$Y = Z \quad \text{[short-run equilibrium]} \tag{6}$$
$$Z = A/\sigma = (I + G)/\sigma \quad \text{[multiplier]} \tag{7}$$
$$v = Y/N = A/(\sigma yN), \tag{8}$$

where $\sigma = s + t(1-s)$ = the private propensity to save + the tax rate = the "leakage rate."[10] Within this framework, fiscal policy (G, t) plays a central role, for if autonomous investment is insufficient to generate something close to full-employment share ($v \approx 1$), then some combination of a higher G or lower t is called for.

What of the distribution of income? Keynesian theory usually insists that wage bargains are made in money terms, and that prices are set as fixed markups on unit costs. Both wages and prices are often taken to be "sticky" in the short run, by

which it is generally meant that they do not immediately respond to unemployment. More important, it has been argued that fixed markups imply that prices rise in the same proportion as money wages (Sawyer 1985: 117–18; Asimakopulos 1991: 29).[11] This would imply that even if money wages were to respond to unemployment (at least at some point), *real* wages would nonetheless remain unchanged. However, if this were so, then real wages, and hence the wage share (in the present static case), would also be utterly impervious to social and institutional pressures.

But the logic of the Keynesian argument does not actually imply that real wages are impervious to unemployment. Indeed, Keynes himself conceded that persistent unemployment would erode not only money wages but also real wages (Bhattacharyea 1987: 276–79). The debate about the "stickiness" (nonlinearity) of the real-wage response to unemployment is not equivalent to a debate about the direction of the response. The next two equations show why. Recall that W = the money wage and P = the price level, so that the real wage $w = W/P$. Equation (9) says that the money wage rises when the level of employment is above some threshold, and falls in the opposite case.

$$W'/W = \mathrm{f}(v-v_0), \tag{9}$$

where v_0 is some threshold level of employment. The parameters that determine the level and steepness of this function may then be taken to represent the strength of social pressures on the money wage. And equation (10) shows that if prices are set as fixed markups on costs, they will change less than money wages because some part of costs is independent of money wages.[12]

$$P'/P = \kappa(W'/W), \tag{10}$$

where $\kappa < 1$ is the share of wage costs in wages plus fixed costs.

This makes it evident that even when workers bargain in terms of money wages and firms set prices by fixed markups, if money wages respond at some point to (un)employment, then so will real wages. The response may be slow and socially painful, as Keynes argued, but it will be inevitable. Since the real wage $w = W/P$, we can write

$$w'/w = \mathrm{F}(v-v_0), \tag{11}$$

where $\mathrm{F}(v-v_0) = (1-\kappa)\cdot\mathrm{f}(v-v_0)$, and $\kappa < 1$, as previously noted. Equation (11) is really a real-wage Phillips curve. The question now arises: What impact might a change in real wages have on the Keynesian story about employment? Note that in the static case, productivity (y) is given, so the wage share $u = w/y$ moves with the real wage, and the profit share $(1-u)$ and profit rate move inversely to it. Then there are two possible channels discussed in the Keynesian literature, both of which lead to the same conclusion. The first of these is the familiar Kaldor–Pasinetti linkage between the private savings rate and the division between wage and profit share.

Let real total savings S = savings out of wages + savings out of profits = $s_w wL + s_\pi \Pi$, where s_w = the propensity to save out of wages, s_π = the propensity to save out of profits, and Π = total real profits. Since total output $Y = wL + \Pi$, we can write

$$s = S/Y = s_w u + s_\pi(1-u) = \text{the private savings rate,} \tag{12}$$

where u = the wage share = $wL/Y = w/y$, and $(1-u)$ = the profit share = $\Pi/Y = (Y - wL)/Y$. If the propensity to save out of wages (s_w) is lower than that out of profits (s_π), a fall in the wage share u will shift the division of income in favor of profits, thereby raising the average private savings rate s. To the extent that tax rates are also higher for profit income, the average tax rate t also will move in the same direction. The "leakage rate" share σ will therefore rise, and as is evident from equations (6)–(8), this will *lower* demand, output, and the employment rate, other things being equal.[13] But other things will not remain equal, because lowered output implies lowered capacity utilization, which then operates through the second channel to undermine investment, which in turn further lowers output and employment. Both channels therefore affect the employment rate in the same direction: a drop in the employment rate that is sufficient to lower real wages will spark further drops in employment, and so on.[14] A rise in employment would obviously have the opposite effect.

This is where the "stickiness" of nominal wages becomes crucial, because it translates into real wage stickiness. Insofar as the distribution of income does *not* respond, the static system remains stable. But if employment (unemployment) changes are strong enough to trigger nominal wage changes, then the static Keynesian model is knife-edge unstable—toward depression on one side, toward inflationary full-employment on the other.

The problem may be put another way. The Keynesian model implicitly relies on the presence of some unstated automatic mechanism that stabilizes the distribution of income. Such a mechanism would have to be substantially independent of social and institutional forces, because if it were not, then the change in the wage share would trigger knife-edge instability. In this way we once again arrive at the conclusion that the static Keynesian model, like its neoclassical counterpart, implies that the wage share is independent of social forces.

The last step is to consider the growth dynamics of the Keynesian model. Allowing for changes in variables over time, we can write equation (8) as

$$v(t) = A(t)/[\sigma y(t)N(t)], \tag{8a}$$

where autonomous demand $A(t) = I(t) + G(t)$ = investment + government spending; share $\sigma = s + t(1-s)$ where s and t are savings and tax rates, respectively; and $y(t)$ is the productivity of labor. Population growth and technical change will persistently raise $N(t)$ and $y(t)$, which will tend to erode employment. But even if autonomous demand $A(t)$ is growing, there is no particular reason why the growth in its two autonomous components should precisely offset the growth in population and productivity. The general imbalance between the two sets of growth rates will then make the employment rate v persistently rise or fall. In the absence of some feedback between v and the other variables, the Keynesian growth model is unstable.

We have seen that a changing employment ratio is likely to change money wages, at least at some point. If fixed markup pricing were indeed to lead to equiproportional changes in prices, then real wages would be unaffected and employment would be unstable. Unfortunately, a flexible real wage turns out to make matters even worse. Even in the dynamic case with technical change, a fall in the employment ratio will lower the wage share. As previously, this would raise the leakage rate share σ and exacerbate the problem of a falling employment rate v. This is the Keynesian paradox of thrift once again, this time in a growth context. Under the standard Keynesian assumptions of exogenous technical change and autonomous investment, the problem of labor market instability therefore seems intractable.

This is the point at which the difference between the Keynesian and Harrodian frameworks becomes decisive. In both cases, when the unemployment rate is above some critical level, the real wage falls. This leads to a rise in the average savings rate. In the Keynesian case, a rise in the savings rate reduces the level of output by reducing the multiplier, and hence further *worsens* the employment situation. In the Harrodian case, the very same rise in the savings rate raises the long-term (warranted) rate of growth, which *improves* employment. Thus, whereas the dependence of the savings rate on the distribution of income destabilizes the employment rate in the Keynesian model, it stabilizes it in the Harrodian one. As we shall see, the crucial difference in the two results stems from a critical difference in their analysis of investment.

Labor Market Dynamics within the Harrodian Tradition

The difference between Keynesian and Harrodian treatments of effective demand is best understood by considering their common starting point: the simple multiplier relation (i.e., with balanced budgets and balanced foreign trade).

$$Y_t = I_t/s. \tag{13}$$

Keynesian economics portrays investment (I_t) as "autonomous" in the short run, in the sense that it is independent of current outcomes. From this point of view, investment is the proximate "cause" of output, via the multiplier. Harrod's point is that this conception of investment contains a fundamental inconsistency. The multiplier effect of investment, he notes, is only half of the story. The very purpose of investment is to expand capacity, and this requires not only the anticipation of demand but an evaluation of the utilization of existing capacity. For investment to be self-consistent, the two aspects must mesh. It follows that the investment path is endogenous, not exogenous as the Keynesians would have it.

These considerations led Harrod to derive the self-consistent path of investment, which he calls the "warranted path." If Y_c = capacity output, then $R = Y_c/K$ = capacity–capital ratio, which Harrod takes to be constant over time (Harrod-neutral technical change). Dividing both sides of the multiplier relation in equation (13) by K, and noting that $I/K = K'/K = g_K$ = the rate of growth of capital and $v_c = Y/Y_c$ = the capacity utilization rate (not to be confused with the wage share u), we get

$$v_c = g_K/(sR). \tag{13a}$$

Equation (13a) is merely another way of expressing the multiplier relation, and it tells us that in short-run equilibrium the actual rate of capacity utilization will depend on how close the rate of growth of capital is to sR. Alternately, it tells us that *only* when $g_K = sR$ will the capacity created by investment match the demand induced by investment spending. Only then will capacity be fully utilized so that $v_c = 1$.[15] Thus the "warranted" rate of capital accumulation is given by

$$g_K^w = sR. \tag{14}$$

It is at this point that the labor market enters into the picture.[16] From equation (1a) the employment rate $v = K/(kN)$. Taking rates of change, defining $g_K = K'/K$, $g_k = k'/k$, and $g_n = N'/N$, and noting that equation (14) implies that $g_K = sR$ along the warranted path, we get the fundamental Harrodian employment dynamic:[17]

$$v'/v = g_K - (g_k + g_n) = sR - (g_k + g_n). \tag{15}$$

This tells us that the warranted rate of employment (unemployment) will be changing continuously whenever the warranted rate (sR) is not equal to what Harrod calls the "natural rate" ($g_k + g_n$). But, as he points out, if s is exogenously given by savings habits, g_n is given by population characteristics, and R and g_k are given by technical change, there is no mechanism to close any gaps and hence prevent v from rising or falling to its limits. It would appear, then, that the employment rate is inherently unstable.

It is here that the dependence of the average saving rate on the distribution of income, which played a *destabilizing* role in the static Keynesian model, now plays a *stabilizing* role in the Harrodian employment dynamic. We saw in equation (12) that the average savings rate is a negative function of the wage share u: $s = s(u)$ such that $s' < 0$. From equation (15), whenever the warranted rate of growth sR is less than the natural rate of growth ($g_k + g_n$), then $v'/v < 0$ and the employment rate v will start to fall (unemployment will rise). Therefore the wage share will also start to fall,[18] which will in turn make the average savings rate s rise. Since the natural rate of growth ($g_k + g_n$) is given, the rise in the savings rate will reduce the initial gap between the warranted and natural rates. This process will continue until the gap is closed and the employment rate is stabilized.

The preceding Harrodian dynamic has a very powerful implication, namely, that there is *only one* wage share that will stabilize the employment (unemployment) rate (i.e., make $v'/v = 0$). Since the savings rate $s(u)$ is a monotonic function of the wage share, and R, g_k, and g_n are all exogenously given, there is only one wage share that will suffice. Moreover, what was implicit in the Keynesian argument now becomes explicit: *the requisite wage share is completely independent of worker strength*, because it is completely determined by savings propensities, technology, and population growth.

Labor Market Dynamics within the Marx-Goodwin Model

The Harrodian analysis of the labor market relies on the notion that a fall in the employment rate v will undermine the wage share u. But it is the direction of response that is central to that discussion. The actual path, and its implications, are not addressed. We do not know, for instance, whether or not the adjustment process leads the economy to full employment. Nor do we know whether we end up *at* the long-run employment rate and corresponding wage share, or merely oscillate around them as in figure 8.2.

It was Goodwin's contribution to take up the latter two issues in his elegant formalization of Marx's notion of a reserve army of labor (endogenous rate of unemployment).[19] He accomplishes this by combining the real-wage Phillips curve that is implicit in the Keynesian argument (equation (11)), the explicit Kaldor–Pasinetti dependence of the savings rate on the wage share (equation (12)), and the employment dynamics implicit in the Harrodian argument (equation (15)). These three equations, which are reproduced below, constitute the basic structure of the Marx–Goodwin model.

$$w'/w = F(v - v_0), \text{ where } v_0 = \text{some threshold rate of employment} \tag{11}$$
$$s = S/Y = s_w u + s_\pi(1 - u) = s(u) = \text{the private savings rate} \tag{12}$$
$$v'/v = g_K - (g_k + g_n) \tag{15}$$

Goodwin directly adopts three central assumptions of the Harrodian formulation: that the economy is on the warranted path, so that the actual rate of accumulation g_K equals the warranted rate of growth sR; that the natural rate is constant ($g_k + g_n$) because the rates of technical change and population growth are constant; and that the capacity–capital ratio R is constant over time (Harrod-neutral technical change). Since output is equal to capacity along the warranted path, $R = Y/K$ =

y/k, which in turn implies that $g_y \equiv y'/y = g_k \equiv k'/k$, both of which are also constant. This allows us to transform the real-wage reaction function in equation (11) into a wage-share reaction function, since $u \equiv w/y$ implies $u'/u = w'/w - g_y$. Finally, Goodwin's original formulation contains three specific simplifications, which although they are not essential for the general results, we retain in order to reproduce Goodwin's original equation system. These are that the wage reaction function is linear, that workers do not save ($s_w = 0$), and that capitalists save everything ($s_\pi = 1$). Goodwin's nonlinear dynamical system is therefore given by

$$u'/u = h(v - v_0) - g_y \tag{16}$$
$$v'/v = (1 - u)R - (g_y + g_n). \tag{17}$$

This 2×2 nonlinear differential equation system is known as the Lotka–Volterra "predator–prey" system. In the first equation, the parameter v_0 is the threshold rate of employment that triggers real-wage increases, and the parameter h is the sensitivity of the wage share to disequilibrium in the labor market. Both of these may be interpreted as aspects of labor strength. Note that $v_0 < 1$ implies that workers are strong enough to begin raising real wages even while there is some unemployment. Therefore a *lower* v_0 constitutes greater worker strength, as does a higher h.

Goodwin's model has four properties that are relevant to our present discussion. First, as in the modified neoclassical wage adjustment function of equations (4b)–(5b) and figure 8.2, the Goodwin model yields a perpetual oscillation around its equilibrium points.[20] Second, as in Harrod, the equilibrium wage share is completely independent of "class struggle." This follows from the Harrodian employment dynamic in equation (17), since $v'/v = 0$ implies a particular wage share $u^* = 1 - (g_y + g_n)/R$ in which neither of the labor strength parameters (v_0, h) appears. Third, equilibrium in the labor market will generally yield some persistent rate of unemployment, since $u'/u = 0$ implies $v^* = v_0 + (g_y/h)$, and this can be less than 1 (but not above it because $v = 1$ represents actual full employment). Finally, while labor strength does not affect the equilibrium wage share u^*, it does affect the equilibrium employment rate v^*. Unfortunately, the effects of greater labor strength are unambiguously negative: a rise in labor strength (a fall in v_0 and/or rise in h) will lead to higher equilibrium unemployment.

Given that Goodwin's model is an attempt to formalize Marx's arguments about labor market dynamics, it is particularly striking that it leads to the conclusion that "class struggle" over wages would not only be completely ineffective in changing the rate of surplus value, but would also harm employment conditions. It should be noted that these conclusions do not arise from the simplifying assumptions of Goodwin's original model, but are rather implicit in both Keynesian and Harrodian formulations also.

Summary and Conclusions

This chapter has attempted to analyze the manner in which alternative macroeconomic frameworks portray the dynamics of the labor market. Two types of dynamics have been of interest, both of which depend upon the mutual interactions between the wage share and the employment rate. In disequilibrium dynamics, the issue is the manner in which these variables respond to imbalances in the labor market, while in growth dynamics the issue is their response to technical change and growth in labor supply. We examined the basic neoclassical, Keynesian, Harrodian, and Marx–Goodwin models, since each embodies a particular approach to macroeconomics.

Dynamics require explicit analysis of stability of various equilibria. But even the existence of a particular stable equilibrium need not imply that the economy will be *at* or even *near* that point. The analysis of the neoclassical model demonstrates that if real wages respond to the *current* excess demand for labor, then the labor market converges to a particular wage at full employment (figure 8.1). But if real wages respond to the *cumulative* excess demand for labor, then the labor market would exhibit endless and possibly large fluctuations in real wages and excess labor demand, *around but not at*, the equilibrium real wage and full employment (figure 8.2). This second type of response is reminiscent of Goodwin's elegant representation of Marx's argument about the reserve army of labor, except that in his model the center of gravity is a persistent level of unemployment, not full employment. In any case, this type of disequilibrium dynamic reminds us that we should be careful to distinguish between equilibrating *paths* and equilibrium *points*. At an empirical level, this cautions us not to confuse observed variables with their putative equilibrium levels.

In the case of growth dynamics, a second type of finding emerges. It turns out that in each of the four macroeconomic approaches, the paradigmatic case is one in which the organizational or institutional strength of labor has no influence whatsoever on the path of real wages and on the level of the wage share. In all of the approaches, it is technical factors and labor supply growth that determine the standard of living of workers. The degree of labor strength in the struggle over wages has no effect at all. In the neoclassical case, this is instanced by the ubiquitous Cobb–Douglas production function, in which the labor elasticity parameter directly determines the wage share. Hence the profit–wage ratio is determined entirely by production conditions. In the standard Keynesian case, the corresponding outcome arises from markup pricing, in which changes in money wages are said to cause equiproportional price changes. This not only leaves the real wage unchanged, but also implies that it is unchangeable. In the Harrodian framework, unemployment affects the wage share, which in turn affects the warranted rate of growth via the dependence of the savings rate on the wage share, à la Kaldor and Pasinetti. This feedback loop leads the system to stabilize around full employment in the long term. But it also implies that the wage share is completely determined by the rates of technical change and population growth, completely independent of labor strength. Finally, even in Goodwin's classic formalization of Marx's theory of the reserve army of labor, "class struggle" over wages has *no* effect whatsoever on the rate of surplus value. Indeed, greater labor strength would only serve to *increase* the long-run equilibrium rate of unemployment. This is a particularly unkind cut for a Marxian model.

Two critical questions are raised by the general theoretical finding that wage shares are independent of labor strength. First of all, is it at all empirically plausible? The stability of wage shares is a well-known "stylized fact." But so are differences between wage shares across nations and across levels of development. Are these differences reducible to those arising solely from technical factors and conditions of labor supply?

Alternately, if social forces do indeed influence the wage share, how might such a mechanism operate? The key expression to consider is equation (15), in which the rate of change of the employment ratio depends solely on two critical variables: the rate of accumulation $g_K = s(u)R$ and the rate of mechanization g_k, assuming that the rate of growth of the labor supply g_n is exogenous.

$$v'/v = g_K - (g_k + g_n) = s(u)R - (g_k + g_n) \tag{15}$$

We saw that if the output–capital ratio R and the mechanization rate g_k are exogenously given, then there is only one wage share, $u = u^*$, consistent with a stable employment rate (i.e., with $v'/v = 0$). But this conclusion would *not be altered* if R and g_k, and indeed even g_n, were to also depend on the wage share.[21] What is needed, therefore, is some other mode of feedback between the employment rate and one of these variables. A particularly simple one is to suppose that the rate of mechanization depends not only on the wage share (i.e., indirectly on the employment rate through its effect on the relative cost of labor) but also directly on the employment rate (i.e., directly on the relative availability of labor). Rowthorn (1984: 203–5) notes that this is precisely the argument in Marx.[22] Then $g_k = f(u,v)$, and

$$v'/v = g_K - (g_k + g_n) = s(u)R - [g_k(u,v) + g_n] \tag{15a}$$

The results of this apparently minor extension are dramatic. Suppose we consider the extreme case in which the wage share is now *entirely* determined by "class struggle," so that $u = u_0$. Then if $v'/v > 0$ initially, the employment rate v will rise, which will raise the mechanization rate $g_k(u_0, v)$, thereby bringing the employment rate back into balance. It follows that the same result would also obtain if we assume that the wage share depends on both "class struggle" and the employment rate. Thus the preceding simple modification completely reverses the general theoretical conclusion that the wage share is independent of labor strength, for now there is plenty of room for the influence of the relative strength of labor.

Notes

1. Strictly speaking, we should also distinguish between virtual and actual magnitudes of Y, W, P, etc. But this leads into the issues of expectation formation and adjustment, which are secondary to our present concerns.

2. Such a linear function can come about as the actual or approximate ratio of nonlinear labor demand and supply functions.

3. The assumption that $a > 1$ ensures that the lowest possible wage, $w = 0$, corresponds to a positive excess demand for labor. This way, as w rises, v falls, so that full employment ($v = 1$) corresponds to some positive level of w.

4. We can rewrite equation (5a) in the form $w' = b_1(w^* - w)$, in which case it is clear that if $w > w^*$, $w' < 0$ and w declines steadily until $w = w^*$. Conversely, if $w < w^*$, $w' > 0$, and w rises steadily until $w = w^*$.

5. We could of course combine the two adjustment processes in equations (4a)–(4b), in which case the system will exhibit oscillatory convergence. Adding random shocks to this process will then result in perpetual erratic oscillations around full employment and a corresponding real wage.

6. This is a direct consequence of the Walrasian assumption that each potential worker expects to be able to sell as much labor as he or she would like. The influence of (expected) demand is therefore eliminated from the start.

7. We could of course create some room for social determination by allowing the household preference structure to respond to politics and institutions. But this would take us outside the standard framework of this school.

8. The Cobb–Douglas production function is of the form $Y = AK^{\beta}L^{1-\beta}$. This can also be written in per-unit-of-labor form as $Y/L = y = Ak^{\beta}$, where $k = K/L$ = the capital–labor ratio. The marginal product of labor MP_L is the partial derivative of Y with respect to L, and through perfect competition this is set equal to the real wage w: $MP_L = (1-\beta)AK^{\beta}L^{-\beta} = (1-\beta)Ak^{\beta} = (1-\beta)y = w$. Thus the wage share $u = w/y = (1-\beta)$, where $(1-\beta)$ is a technological parameter representing the partial elasticity of output with respect to labor.

9. There is, in addition, a separate question of whether the neoclassical growth model would indeed be stable in the face of real-wage adjustment processes such as that in equations (4a)–(4b).

10. In the standard derivation, $Z = C + I + G$, where here consumption $C = c(Y - T)$, taxes $T = tY$, and I and G are exogenous in the short run. The assumption of short-run equilibrium $Y = Z$ then implies that $Y = c(Y - T) + I + G$, so that $(1 - c)(Y - T) + T = s(Y - tY) + tY = [s + t(1 - s)]Y = I + G$, where $s = 1 - c$ = the private savings rate and t = the tax rate. Since both s and t are leakages from expenditures, share $\sigma = [s + t(1-s)]$ may be termed the "leakage rate."

11. In a pure circulating capital model, if all prices are constructed from fixed markups on costs, then all costs can be resolved directly or indirectly into wage costs. It follows that if markups are held constant, prices will change in the same proportion as money wages.

12. If we define prices as fixed markups on unit costs, then $P = (1+\mu)\cdot(a_0 + Pm +$

Wl), where μ = the fixed markup on unit costs, a_0 = the autonomous component of unit costs (such as fixed costs and costs of imports), m = materials used per unit output, and l = labor used per unit output. This gives us the expression $P[1-(1+\mu)m] = (1+\mu)(a_0 + Wl)$, and differentiating this yields $P'[1-(1+\mu)m] = W'(1+\mu)l$. Dividing the latter relation by the one preceding it and simplifying gives us $P'/P = \kappa(W'/W)$, where $\kappa = (Wl)/(a_0 + Wl)$ = the share of wage costs in nonmaterial costs.

13. This is a version of the Keynesian paradox of thrift, in which a higher savings rate lowers the level of employment (Foley and Michl 1999: 185–86, 189).

14. One might add that the rise in potential profitability consequent on a fall in real wages might stimulate investment, and hence counteract the other effects. Keynesian economics recognizes that investment depends on *both* the marginal efficiency of investment (the potential rate of return on new investment) and the rate of interest (the opportunity cost of new investment). But it tends to require both being determined elsewhere in the system, and hence ignores this potential stabilizing reaction (Rogers 1989: 260–61; Panico 1988: 181–90).

15. Capacity represents economic capacity, not engineering capacity. Thus capacity is fully utilized when it is at the most profitable point of utilization, which includes the optimal amount of reserve capacity needed to meet the demands of business and fend off competitors. A firm has excess capacity when its utilization is below this point, and has a deficiency of capacity when it is above this point. Either instance will provoke a response in investment plans.

16. A separate issue has to do with the apparent instability of the Harrodian warranted path. This path is in fact quite stable (Shaikh 1989, 1991). We will not pursue that question here.

17. Since Y, K, and Y_c all grow at the same rate along the warranted path, $g_K = g_Y$. And since $Y = Y_c$ along the warranted path, $R = Y_c/K = Y/K = y/k$. Then the assumed constancy of R (Harrod-neutral technical change) implies that $g_k = g_y$. With these substitutions, equation (13) can be written in the more familiar Harrodian form $v'/v = g_Y - (g_y + g_n) = sR - (g_y + g_n)$.

18. If the real-wage Phillips curve of equation (11) is expressed in linearized form, $w'/w = h(v - v_0) = -hv_0 + hv$. This is the form used by Goodwin (1967), and it implies that the rate of change of the wage share $u = w/y$ is given by $u'/u = w'/w - y'/y = -(hv_0 + g_y) + hv$. Thus the wage share will rise once the employment rate has exceeded the threshold $(v_0 + g_y/h)$.

19. Solow (1990: 35–36) justly observes that the Goodwin model is a "beautiful paper" which "does its business clearly and forcefully."

20. This oscillation is of a somewhat different character, though, since this equilibrium point of the Goodwin model is a quasi-stable center.

21. If the latter relations were nonlinear, it might be true that there would be more than one wage share which might work. But even so, none of these would be dependent on labor strength, for the same reasons as previously.

22. Rowthorn (1984: 204) points to Marx's "often expressed and often cited view that capital can always overcome labour shortages by adapting its rhythm of work and methods of production . . . [thus] shortages of labour . . . can eventually be overcome by reorganizing methods of production or mechanizing or redesigning the work process . . . given time, capital can adapt itself to whatever supplies of labour are available."

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