

Part II
A Critique of
Self-adjusting Full Employment

8 Neutrality and Full employment

8.1 Logic of the models summarised

In the previous three chapters four versions of the neoclassical macro model were presented, along with a running critique. In this chapter a synthesis of the various critiques is provided by focusing upon the neutrality of money and full employment. The discussion is more easily followed by first providing a concise summary of the central features of the various models previously considered, found in Table 8.1.

The difference among the four models can be briefly stated. Only in the first is there a strict dichotomy between real and monetary variables. The dichotomy is logically false because of the clash of Walras' Law and the quantity theory of money over the excess demand for money when the model is not in general equilibrium. In the second model this inconsistency is eliminated, but the introduction of the real balance effect results in no autonomous real solution. Money is strictly neutral, so the values of real variables are not altered in full employment equilibrium by a change in the nominal money supply alone. However, unlike in the False Dichotomy variant the nominal money supply enters directly to determine the value of each real variable. Real and nominal variables cannot be partitioned. The model is of heuristic interest only. Central to its operation is the wealth-holding of agents, but no interest-bearing assets are included.

The third model solves the problem of the inconsistency between Walras' Law and the Quantity theory in a different way. Here interest-yielding bonds are introduced, so the demand for money is interest-elastic. Again there is no separation between real and monetary variables, though money is strictly neutral for full employment equilibria. Due to the possibility of an inconsistency between saving and investment and the liquidity trap, full employment is a special case in this model. In the final model the logical barriers to full employment are eliminated, but the introduction of the wealth effect renders money non-neutral. There is no autonomous real solution,

In Table 8.2 the summary of the neoclassical models is continued, with selected predictions listed down the left-hand side, followed in subsequent columns by analytical commentary. The predictions assume that 'other things are equal'; i.e., the parameters of

all functions remain the same and exogenous variables, supply of money and bonds, do not change. As pointed out above, the neoclassical model predicts that an increase in employment is associated with lower real wages, lower money wages, a lower price level, and a lower interest rate. These predictions are contingent upon the assumptions of single commodity production, which ensures a negatively sloped demand for labour, and an exogenous money supply.

Casual empiricism suggests that these predictions are rarely realized in practice (see final column of the table). Experience and an inspection of short-run economic statistics published by governments suggest that when employment rises, real wages, money wages, the price level, and the interest rate all tend to rise, not to fall. Keynes made much of these empirical relationships when counselling against money wage cuts as a solution to unemployment in the 1930s (Keynes 1936, Chapter 19). That casual or even systematic observations do not correspond to the predictions of a theory does not in itself represent a refutation of that theory. As Marx wrote, were it possible to deduce correction explanations from observation alone, economic and social theory would be unnecessary.

However, the divergence of economic outcomes from what are predicted to occur is troublesome for neoclassical analysis for two reasons. First, when considering competing economic paradigms neoclassical writers are quick to apply the test of empiricism. For example, in histories of economic thought by neoclassical writers one finds the assertion that Marx's theory can be judged false because it predicts a falling standard of living for the working class as capitalism develops and this has not occurred; that it predicts the profit rate to decline secularly and this also has not occurred; that labour cannot be the sole source of value because this would imply that labour-intensive industries would be more profitable than capital-intensive ones, which is not systematically the case; and so on. It would be equally valid for a critic of neoclassical theory to assert that IS-LM analysis is wrong, because in general expansions of employment are associated with upward pressure on prices and wages, while the theory predicts the opposite.

Second, the test of empiricism has a particular sting to it for neoclassical theory because the concepts which the theory employs are counter-empirical, bearing little

relation to observed economic categories. Two of these, homogeneous output and the money supply, have been dealt with at length. Neoclassical practitioners would perhaps argue that as abstract and ideal as their concepts are, these are constantly subjected to empirical test. The mainstream journals are full of empirical studies, not to mention hundreds of books and monographs published every year. However, the method of these empirical studies is to first formulate a model incorporating neoclassical concepts, then to see if the subsequent statistical results sustain the predictions of the model. This procedure is not a test of the validity of the model, but an exercise to see if there exists a formulation of the model which certain empirical evidence will not contradict. To take an analogy, the Ptolemaic model of a geocentric planetary system was rendered by its adherents to be consistent with the observed movement of the planets, moon, and sun in the sky. This was possible because the Ptolemaic system can be treated as a mathematical analogue of a heliocentric system. Notwithstanding its ‘empirical validity’, the geocentric model of the solar system is wrong.

While all theories must have an empirical analogue, this analogue does not establish their validity. Key to establishing validity is nature and adequacy of the concepts the theory employs, and the logical consistency of the conclusions reached from those concepts. In the preceding chapters challenged the basic neoclassical concepts on grounds of internal consistency. Below we take the process further and consider the two key conclusions based upon those concepts.

8.2 The Significance of Neutrality

After considerable treatment of standard neoclassical models, it has been established that the clearing of markets with instantaneously flexible price, wage, and interest rate results in a full employment equilibrium if the model includes a wealth effect. However, inclusion of a wealth effect renders money non-neutral. Only in a model with no financial assets other than money can neutrality be consistent with full employment with no qualifications. One might at this point legitimately say, ‘so what?’ The central issue is whether a capitalist economy tends automatically to full employment. If this can be demonstrated, surely the neutrality question is icing-on-the-cake; a bit more than a curiosity, but not much more.

However, one is dealing here with considerably more than a minor point. While the major issue is whether a capitalist economy has a natural tendency to full employment, this is inseparably linked with the neutrality of money. Within the debate over neutrality, arcane and esoteric as it may seem, lurks a powerful ideological message. The neutrality of money is central to the fundamental question of whether state intervention in a capitalist economy is justified.

That money is neutral with respect to real variables is the keystone of what might be called the 'naturalistic' view of capitalist society. Always implicit and frequently explicit in neoclassical theory is the assertion that economic life is governed by laws which have the status and inexorability of the laws of physics and chemistry. These laws are timeless and objective; i.e., they exist independently of whether one perceives and understands them. Central to this naturalistic view of economic phenomena is the dichotomy between real and monetary variables, and, therefore, the relationship between a barter economy and a money economy.

To develop the argument, let us assume for the moment that the real world of economic relations is characterized by (1) an automatic tendency towards full employment through market clearing, with no exceptions; and (2) that money is neutral. If this is the case, there exists a combination of real variables at full employment which is unique.¹ Being unique, it is the only set of real variables for which output/income and employment will be at a maximum. All other sets of real variables will result in lower output/income and employment. Ignoring distributional effects and presuming more output/income to be desired compared with less, the full employment solution is not only unique, but desirable (optimal) above all others. If one goes a step further and presumes that there is a tendency for unregulated markets² to bring about this unique and most desirable set of real variables automatically, then there is no place for state intervention. At best, the state can attempt to do what the process of market clearing would bring about automatically. At worst, and considerably more likely by this line of argument, intervention by the state will prevent market clearing from generating the optimal result.

¹Uniqueness requires additional assumptions. But for sake of argument, uniqueness is accepted.

² In this argument markets are 'unregulated and 'free' in the absence of state intervention.

In this unique and optimal full employment solution, state intervention is characteristically referred to as creating 'distortions', defined as arbitrary conditions that 'distort' the economy from its natural, optimal equilibrium. These distortions may take many forms. Excessive state borrowing will create 'crowding' in money markets, transferring credit from the private sector to the public sector. Public expenditures will redistribute resources from private hands to the public sector. If the state can limit its action to the minimum, and at the same time have a purely neutral impact on private decision making, will its behaviour not reduce the general welfare.

A necessary but not sufficient condition for this anti-interventionist argument is that money be neutral. If money is not neutral, then the full employment solution is not unique. In the real wealth effect model of the previous chapter full employment output/income and employment itself may be unique; i.e., there may be no other level of employment and output for which the labour market is cleared,³ but these values are consistent with an infinitive variation in the other real variables. Put another way, there is no real solution as such. By changing the money supply, 'the monetary authorities' can produce an infinite variation upon the full employment theme, none of which can be singled out as prefer" able to others without explicit value judgments. The free market does not produce the most desired result; indeed, without state action it produces no result at all since the state determines the money supply.

For example, the state might wish to achieve a higher rate of economic growth, and could do this by increasing the money supply, which would drive down the rate of interest and increase investment absolutely and relatively to consumption.⁴ As alternative, the state might seek to change the functional distribution of income between wages and profits (the latter not distinguished from interest in the neoclassical model). This could be done again by acting upon the interest rate and the money wage via the

³ The full employment values y_e and n_e need not be unique. As noted in the previous section (and discussed in Section 2.2), it would be reasonable to assume that the supply of labour is influenced directly by the interest rate. If this were the case, n_e would no longer be unique nor would y_e .

⁴ In the examples given we make the invalid but simplifying assumption that the state acts autonomously of economic agents.

money supply.⁵ When money is not neutral, all full employment equilibrium are arbitrary. Each is unique only with respect to a given money supply and a given supply of bonds. Public intervention via the money supply or supply of bonds is one of the defining characteristics of an equilibrium. Non-neutrality of money renders the debate over the desirability of state intervention moot. The relevant issue becomes, what form of intervention and to what extent?

The argument that the natural forces of the free market generate an optimal solution which governments distort at the cost of: the general welfare rests upon the presumption of the neutrality of money. Neutrality is a thin thread by which to hang such an ideologically powerful message. Granting all assumptions, neutrality could not be justified in the simple classical model because of the inconsistency between Walras' Law and the quantity theory (see Chapter 4). Once the money market includes the interest rate, the theorist is forced to choose between a guaranteed employment solution and neutrality, the one excluding the other.

In this context one might recall that Patinkin claimed that the real balance effect was the *sine qua non* of all monetary theory. Neoclassical economists have tended to reject this as a grandiose assertion. Yet, there is a sense in which Patinkin was correct, for the narrowly defined real balance effect that includes only money produces the only model in which neutrality and full employment can be unambiguously combined. This is an excellent example of the cliché, 'the exception that proves the rule'. A model with no bonds is too restrictive to be taken as more than a heuristic exercise, even among neoclassical theorists.

⁵ In the models developed in the previous chapters, no action by the 'monetary authorities' can change the functional distribution of income. This is because the production function used, the Cobb-Douglas, implies constant factor shares no matter what the values of y , w , and r . With a more general functional form, even of the Constant Elasticity of Substitution type (of which the Cobb-Douglas is a special case), a change in r would alter the distribution between wages and profits. This discussion of distribution refers to points of full employment equilibrium and ignores the impact of fiscal policy, particularly taxation.

8.3 Full Employment Further Investigated

While the hallmarks of the standard textbook version of the neoclassical model are the neutrality of money and an automatic tendency to full employment in the absence of ‘arbitrary’ constraints such as inflexible money wages, it has been demonstrated that the two are not theoretically compatible. This incompatibility was demonstrated in the previous chapter, where most attention was focused upon states of full employment equilibria. At this point a critical eye is turned to the concept of full employment itself; or rather, that concept as it manifests itself in neoclassical analysis. As shown with the introduction of the wealth effect, it is possible within the synthesis paradigm to reach a value judgment that unemployment of a portion of the labour force must always be ‘voluntary’, in the sense that unemployment of labour can only occur in logic if money wages do not fall to clear the labour market. Since employers might reasonably be assumed not to oppose lower wages, the cause for wages being too high must come from the implicit or explicit actions of workers, individually or collectively. In a word, workers must accept the ‘blame’ for unemployment.

While the logic of the neoclassical model seems to grind inexorably to this conclusion, the conclusion is not as strong as it may seem. In the first instance, it is open to question whether the neoclassical model can assert any conclusions about unemployment. The difficulty which arises might be called ‘the case of the missing excess demand’. If one looks back to the ‘complete Keynesian model’ with rigid money wages (Chapter 6), one notes that less than full employment equilibrium is associated with equilibrium in the commodity market and the money market: saving equalled investment and the demand for money equalled the supply, with the bond market implicitly in equilibrium. Therefore, rigid money wages yielded a solution in which the labour market was characterized by excess supply, but the excess supplies and demands in all other markets were zero, in sum and individually. This is inconsistent with Walras’ Law, which requires that the sum of excess demands and excess supplies be zero for the system as a whole. It would appear that even ‘voluntary’ unemployment, employment resulting from rigid money wages, is logically inconsistent with the neoclassical market clearing mechanism, Walras’ Law, which is so central to the entire theory. This logical difficulty has preoccupied some neoclassical economists, provoking a search for the

missing excess demand to match the excess supply of labour.⁶ While *ad hoc* solutions to this difficulty can be produced, the result has the appearance of being forced upon the theory by necessity rather than arising from its logic.

The basic difficulty is that the model *presupposes* full employment. This presupposition arises from the nature of Walras' Law, which should now be briefly reviewed. At one level Walras' Law is the salvation of the neoclassical model by ensuring that the clearing of individual markets is consistent with aggregate market clearing. The elimination of excess demand and excess supply in one market does not in itself move the neoclassical model toward general equilibrium. On the contrary, the clearing of one market can make full employment impossible to achieve as explained in the discussion of false trading in Section 3.4. Walras' Law avoids this difficulty. As counterfactual as the mythical auctioneer may be, no systematic tendency to full employment is logically possible without the Law, no matter what other assumptions are made.

On another level, Walras' Law is a curse upon the neoclassical model, for it cannot be applied to any stable equilibrium except one of full employment. If the labour market is not cleared due to rigid money wages, then the Law requires that some other market also not be cleared. *But only in the labour market is non-clearing consistent with a stable solution.* Should it be the commodity market which is nominated to balance the excess supply in the labour market with an excess demand, then the situation is logically inconsistent. An excess demand for the single commodity, provoking a rise in price and output/income, implies that the money wage is too low, a labour shortage, contradicting the initial situation of excess labour supply, and rendering the downward inflexibility of the money wage irrelevant. The commodity market must be rejected, for the only possibility there consistent with unemployment is supply excess which makes the logical difficulty worse, two unanswered excess supplies instead of one.

⁶ The problem of a dangling excess supply is not restricted to the labour market. Recall that the demand for labour schedule is constructed on the assumption that firms plan their supply with no demand constraint. This implies that the notional supply of output is full employment output. Thus at less than full employment equilibrium, there is a second unrequited excess supply, for the single commodity.

The only other candidate is the money market, but disequilibrium there would seem inconsistent with equilibrium in the commodity market. If the commodity market is in equilibrium, then both output/income and the interest rate are in equilibrium unless disturbed elsewhere. Since the nominal supplies of money and bonds are exogenous and the demands for money and bonds are set by the variables rendered stable in the commodity market, the interest rate and level of income/output, the compensating excess demand cannot be the financial markets.

The fundamental sources of the difficulties reflected in the logical problem of Walras' Law at less than full employment are two. First, in the neoclassical model the labour market is only formally linked to the other markets. As long as the demand for and supply of labour are specified in terms of the commodity ('real') wage, the positions of these schedules must be independent of what happens in all other markets. This first source of difficulty arises from carrying forward a labour market analysis appropriate to a barter economy into models in which 'real' solutions either are no longer relevant or do not exist at all.

The second source of difficulty arises from the treatment of the commodity which workers sell. Formally, the commodity workers sell is no different from the other commodities in the model. However, only in the labour market can an arbitrary limitation upon the value of the price variable prevent market clearing. Consider the consequences of rigidity of the other two price variables in the model, the price of the single commodity and the interest rate. If price is inflexible downward, the commodity market will clear (saving will be equated to investment) by a change in the level of output/income, which will also imply a change in the interest rate (movement along the IS curve). The money market will be cleared in the same manner. If the interest rate is inflexible, income will again equilibrate the commodity and money markets. While an inflexible price or inflexible interest rate will produce excess supply or excess demand in the labour market, neither can result in a stable situation in which there is excess supply or demand in the commodity or financial markets.

The discussion so far has been somewhat complex, but the fundamental difficulty can be stated clearly. In a system governed by Walras' Law, equilibrium is achieved by the adjustment of price variables to notional full employment supplies and demands. No

points on demand and supply schedules except those of full employment are ever achieved even in theory because false trading is prohibited. In contrast to this, a less than full employment equilibrium, even reached according to strict neoclassical rules, is a non-Walrasian position, for it is by definition a position of false trading. It is invalid to conclude from the neoclassical model that unemployment is 'voluntary', or to assign blame to workers for demanding excessive money wages. These judgments are invalid because the neoclassical model, firmly grounded in Walras' Law, has no analysis of unemployment at all, be it voluntary or involuntary.⁷

The basic problem can be traced back to the nature of Walras' Law itself. It is singularly inappropriate for the purpose assigned to it in the neoclassical model, though absolutely necessary. Walras formulated his law for a market 'period' during which no production occurred; i.e., commodity supplies are given throughout the trading-period. By contrast, the neoclassical macro model purports to analyze a situation in which the output of the single commodity is a decision variable. In the original Walrasian system agents were precluded from manifesting their disappointment by varying the quantity of commodities they brought to the market. In the neoclassical macro model firms come to the market with nothing, because labourers must be hired and set to work before there is anything to sell.

The Walrasian model of Walras never pretended to consider the question of what portion of the population might be gainfully employed. Walras sought a solution to the relative prices of commodities in a many commodity system in which the supplies of these commodities were given. By the criterion of logic, Walras can be judged to have provided a determinate answer to the question he posed, though it is difficult to conjure up an actual situation which corresponds to his solution. Neoclassical theorists assign a quite different task to the hypothetical Walrasian market day and to Walras' Law. Ignoring the central issue posed by Walras, relative commodity prices, by presuming a one commodity world, they attempt to apply Walrasian analysis to a situation in which

⁷ This was recognized by the new classical economics school, which argues that deviations from full employment do not occur even in the short run. While this position is perhaps the most faithful to the logic of the neoclassical model, one is reminded of Oscar Wilde's observation that madness is anything carried to its logical conclusion.

the quantity of the single commodity is variable. It is hardly surprising that Walras' principles prove inconsistent in all cases except when the supply of the single commodity is in effect fixed; i.e. at a unique point of full employment equilibrium.

None the less, does it not remain the case, with or without Walras' Law, that an excessive level of money wages will result in unemployment? A commonsense argument would seem to serve as well as the esoteric of Walrasian general equilibrium: if money wages are high, labour costs to firms are high, and this induces firms to hire less labour than they would were money wages lower. But once one abandons a Walrasian world, it is not at all obvious that lower wages would increase employment. Causality as it appears to the individual capitalist may not be valid for all capitalists taken together. Lower wages reduce the demand for commodities, and if all markets do not clear simultaneously the level of employment could fall. In the absence of the strict discipline of the Walrasian auctioneer, the impact of lower wages on employment is an empirical question, about which no general theoretical conclusion can be drawn.

While neoclassical analysis can produce a formally elegant model of full employment, it has no theory of unemployment. This conclusion seems startling for an analysis which offers such definitive prescriptions for economic policy; none the less it is true. The absence of a theory of unemployment is why neoclassical theory, like its 'classical' forerunner is a special case, and why Keynes by dealing with situations of less than full employment contended that his was the general theory of employment, interest and money.

8.4 The 'Unemployment of Capital'?

Even should we ignore the logical difficulties associated with Walras' Law, the synthesis treatment of unemployment presents a troubling anomaly. As shown in Chapter 2, neoclassical theory treats output/income as the result of the combination of capital and labour. These two inputs into the production/value added function are treated as being strictly analogous. In contemporary literature the analytical similarity of the two is emphasized by use of the terms 'capital services' and 'labour services', each of which is seen as flowing from assets, physical and human capital. But in the neoclassical macroeconomic model the strict similarity between capital and labour as inputs breaks

down in a dramatic way. In the short run model labour can be unemployed but capital apparently cannot. Investigation of this apparent anomaly provides insights into the synthesis model, as well as anticipating the post-Keynesian critique of the neoclassical model which follows in Chapters 10 and 11.

Before proceeding further with the consideration of the possibility of capital being unemployed, it must be stressed that we do not refer to under-utilization of capacity, which is a non-neoclassical concept. Capacity utilization refers to a situation in which part of plant and machinery lie idle because of insufficient demand for the commodity which that plant and equipment produce. Because of the assumption of substitution between capital and labour, demand conditions cannot induce an individual maximizing capitalist to use less than all of the available capital stock in a neoclassical world. In the short run, capital costs are fixed, so for any level of anticipated output unit costs will be minimized by minimizing variable (labour) costs, which with a given wage rate implies hiring as few workers as possible. Competition among firms, requiring each to sell at lowest achievable unit cost with all neoclassical firms are assumed identical, ensures that the entire capital stock will be utilized by whatever labour is hired.

Let us attempt to treat labour and capital strictly analogously, a manner of treatment characteristic of the neoclassical model in general. In doing so one would expect that if a real wage above the full employment equilibrium rate results in the unemployment of labour, then a rate of return on capital above the equilibrium level would result in unemployment of capital. This possibility is illustrated in Figure 8.1. In part 8.1a are drawn the production isoquants, contour lines each representing a constant level of output in the two-dimensional capital-labour space. The capital stock is fixed at k^* and the labour supply at n^* . If the labour market clears, equilibrium full employment output is e^* . The top left-hand quadrant shows the ‘demand curve for capital’, with the marginal product of capital equated to the rate of return, r , since maximizing behaviour implies $MP_k = r$, just as it implies $MP_n = w$. Figure 8.1d shows the labour market, which is familiar from previous chapters. Finally, in Figure 8.1c is the ratio of the commodity wage to the rate of return, the ‘factor price ratio’. Equilibrium with full employment of labour and of capital is associated with r_e and w_e . The first point to note is the sense in which capital is fixed and labour is variable. Because it is assumed that the labour supply

is invariant with respect to its only determining influence, the commodity wage, both factors are fixed in the sense that their potentially available quantities are given. If both have invariant supplies, in what sense is capital fixed and labour variable?⁸

This question can be answered by proceeding in the attempt to treat capital and labour in a strictly analogous manner in Figure 8.1. Assume that; the equilibrium money wage is some W_e and workers as a group refuse to sell their services for less than W_o , which is greater than W_e . As we saw in the previous chapter, given the money supply, W_o will imply a commodity wage, $w_o = W_o/p_o$, which is higher than the full employment equilibrium commodity wage, w_e . These two commodity wage levels are shown in Figure 8.1d. With employment lower at n_o , the marginal product of capital schedule shifts inwards, and the rate of return falls. All of the values noted by '0'

⁸ Now it is not justified to refer to r as 'the interest rate'. Indeed, it has not been valid throughout the discussion so far to proceed as if there were no difference between the rate of return and the interest rate. We have been following rather sloppy convention by doing so. In the factor markets, maximizing behaviour involves the rate of return, while in the market for investment it is the lending rate which is relevant. In general the two are not the same in the short run, even in full employment equilibrium. Rather than showing this algebraically, one can demonstrate the divergence of the two with a 'thought experiment'. Assume that any of the models of the previous chapter are at less than full employment equilibrium in the short run (i.e. money wages are initially assumed rigid). Let money wages fall to clear the labour market. Since employment will rise, the commodity wage must fall and the rate of return must rise. The latter must rise because more labour combined with a given capital stock results in a rise in the average and marginal products for capital for any level of k . However, over in the other markets, the lending rate (interest rate) must fall, because the IS curve is downwardly sloped, greater output/income requires a lower interest rate. Only by coincidence will all of the functions of the model be such that the rate of return and the interest rate are the same at full employment equilibrium. Static general equilibrium analysis is not designed to treat this inequality of the rate of return and the interest rate. They are brought into equality by adjustment of the capital stock, which lies in the domain of growth theory. With the interest rate not equal to the rate of return, interpretation of the 'adding up' equation becomes problematical ($y = wn + rk$, see Chapter 2). We make no attempt to tidy up this loose end of the neoclassical model.

indicate the situation when rigid money wages result in the unemployment of labour while capital remains fully used.

Let the situation be reversed, indicated by values with the number 1. In this case, capitalists demand a certain rate of return, r_1 , the consequence of which is to leave part of the capital stock 'unemployed', k^* to k_1 . With the employment of capital at level k_1 , the marginal product of labour shifts to wards the origin, and full employment of labour is achieved at a lower commodity wage than before, w_1 . This particular 'thought experiment' in which capital is not completely used is not treated in neoclassical theory. Neoclassical theorists are quite correct to ignore it, because the 'experiment' is nonsensical. In attempting to treat labour and capital as strictly analogous and parallel factors of production, one reaches a nonsensical result because the two factors are not analogous and parallel. It is worth repeating that the logical sense of unemployed labour in the short run, on the one hand, and the logical nonsense of capital being unemployed in the short run, on the other, has nothing to do with the available quantity of one factor being fixed and the other being variable.

In the model being analyzed, the supplies of both factors are exogenously given. This is the same treatment as in the previous chapter, where there was no difficulty producing conditions under which part of the fixed labour supply was unemployed; no difficulty if we ignore the nagging problem of Walras' Law being violated out of full employment. Analyzing labour as partially unemployed makes sense, but doing the same for capital does not because the nature of competition among workers is different from the competition among capitalists. If capitalists combine to administer a fixed market price, for example, individual capitalists who are initially a party to this agreement can gain by violating it. By underselling the fixed price, the maverick can expand his or her market share and gain a larger profit than operating within the agreement. Competition among capitalists tends to make coalitions unstable. However, a worker who is an employed member of a trade union that has negotiated a fixed wage can only lose by underselling the capacity to work, not what he or she produces. This difference between competition among capitalists and among workers reflects capitalist relations of ownership.

Neoclassical theory reaches a profound truth when it ignores the possibility of unemployed capital, though for the wrong reason. The neoclassical reason for treating capital as fully employed is that in the short run rational capitalist behaviour will dictate utilizing the existing capital stock with whatever labour is available. The basic truth of this assertion arises from the fact that no exchange need occur for capital to be employed, while employment of labour requires a successful sale and purchase.

Here one must move from the world of imaginary models to the actual world of economic and social relations. The machinery and equipment available for use at any moment is the property of capitalists. It has been exchanged and is in place; hence it is called the capital *stock*. The output resulting from the capital stock must be sold profitably to justify continued use of machinery and equipment. However, the 'services' of capital associated with a given output are not for the most part exchanged, except implicitly as cost entries on a ledger.⁹ Labour services by contrast must be repeatedly exchanged, and unemployment results because workers do not own the means by which production is carried out and, therefore, must sell their working capacity in order to participate in the production process. Their motivation for this participation is that they lack the means to produce. They cannot directly provide themselves and their families with food, clothing, and other necessities. In other words, workers can be unemployed because they must work for others (non-workers), and they must work for others because they lack the means which would enable them to work for themselves.

The relevance of this discussion to the neoclassical macro model is that it indicates the fundamental cause of unemployment: workers do not have direct access to the means by which production is carried out. Workers must first sell before they can work. The property relations of a capitalist society are the fundamental cause of the idleness of part of society's resources. The use of the term 'capital services' tends to obscure this basic cause of unemployment by suggesting that labour and capital are strictly analogous in production and exchange, which they are not.

⁹ The point holds if dividend payments are interpreted as reflecting the flow of 'capital services' and common stock shares as ownership of productive capital. What is 'owned' in this case is a claim on income. No shareholder in IMB can identify his or her fragment of the company's plant and equipment, much less choose to hold it out of production.

The property relations of a capitalist economy imply that the labour market is fundamentally different from other markets. In every developed country the history of the labour movement has been the struggle to reduce competition among workers. By contrast, commodity and money markets are inherently competitive. Neoclassical economists, particularly the more conservative, take a sceptical view of arguments alleging systematic price fixing through collusion by capitalists. Their argument is that such arrangements tend to break down under the pressure of competition from disgruntled sellers in the market or potential competitors who are eager to enter when profits are high. This argument has considerable empirical support as well as a sound basis in Ricardian and Marxian theory (see Weeks 1982, 6).

The asymmetry between capital and labour, which implicitly manifests itself in the synthesis macro model has not gone unnoticed by critics who accept the general neoclassical paradigm. Leijonhufvud, whose critique is treated in Chapter 11, refers to the asymmetry as the 'transactions structure' of a money economy (Leijonhufvud 1981, 90). His argument is that in a money economy characterised by self-employed craftsmen and farmers, unemployment would be impossible. Without employers there are no employed people, thus no unemployed. The point is a profound one, rarely made explicit in mainstream economics.

Table 8.1 Summary of the characteristics of the neoclassical model

Category/model	1 False dichotomy	2 'Classical' with RBE	3 'Complete Keynesian'	4 Keynesian with WE
Commodity market	$c = c(y)$ $i = i(r)$	$c = c(y, M^*/p)$ $i = i(r)$	$c = c(y)$ $i = i(r)$	$c = c(y, q)$ $i = i(r, q)$
Money market	$M_s = M^*$ $M_d = vpy$	$M_s = M^*$ $M_d = vpy$ $+ f[M^*/p]$	$M_s = M^*$ $M_d = vpy$ $+ [h - jr]$	$M_s = M^*$ $M_d = vpy$ $+ M(r, q)$
Automatic full employment?	No Inconsistency i & s	Yes RBE acts on c	No Inconsistency i & s, liquidity trap	Yes q acts on c, i and M_d
Neutrality of money?	Yes	Yes	Yes	No
Comments	Logically invalid, WL & QT clash	Heuristic value only, no bonds, requires 'outside' M^*	Not to be confused with the model of the <i>GTEIM</i>	Requires M^* and bonds to be 'outside'

Notation:

RBE - real balance effect

WE - wealth effect

WL - Walras' Law

GTEIM - *General Theory of Employment, Interest and Money*

Table 8.2 Theoretical predictions of the neoclassical model (from an initial position of less than full employment)

<u>The model predicts:</u>	<u>Necessary conditions</u>	<u>Casual empiricism</u>
1. Real wages fall when employment rises	Diminishing returns with a one product production function (see note below)	Real wages rise when employment falls
2. Money wages fall when employment rises	As above, and exogenously given money supply	Money wages rise or remain constant when employment rises
3. Price level falls when output rises (nominal value of output can fall in models 3 & 4, Table 8.1)	Diminishing returns, one product, exogenous M	Price level rises or constant when employment rises
4. Interest rate falls when output rises	Interest-elastic investment, exogenous M (r-elastic in M_d in models 3 & 4)	Interest rate rises or is constant when output rises

Note: The law of diminishing returns requires a single product aggregate production function for reasons given in Section 2.1, and also implied by the Capital Controversy (Chapter 10).

9 Expectations and Full Employment

9.1 Perfect, Static and Adaptive Expectations

In the 1970s a new and in the view of some a revolutionary element was added to the neoclassical macroeconomic model, the rational expectations hypothesis (REH), based on the work of John Muth a decade earlier. Closely associated with the REH was the ‘new classical economics’, which is treated in this chapter. While it was the members of the new classical school who were instrumental in introducing the REH into economics, its influence was not limited to them. In order to appreciate the implications of the REH, it is necessary to consider neoclassical treatments of expectations that predated the REH.

Except for Keynes’s treatment of the demand for money, there was little explicit reference to expectations in the previous chapters. However, present throughout was the presumption of ‘perfect foresight’. The simultaneous clearing of all markets required a ban on false trading; all exchanges had to be at general equilibrium prices. The creation of an imaginary auctioneer to oversee trades served to enforce the prohibition against false trading. If the auctioneer is taken away, then market clearing requires that each trader enforce upon herself or himself not to buy or sell at equilibrium prices. A trader can avoid ‘false’ prices by knowing the general equilibrium prices which will prevail when all trades are complete. In other words, traders must know without error what will happen in the future. Assuming an omniscient auctioneer is formally equivalent to traders knowing the future: perfect foresight. Implicitly or explicitly pre-Keynesian general equilibrium analysis and much neoclassical analysis subsequent to Keynes assumed perfect foresight.

There are many objections of the perfect foresight hypothesis (PFH). In the neoclassical literature one frequently finds the argument that the PFH is unsatisfactory because it is inconsistent with utility maximisation. In order to have perfect foresight, it is argued, one more information than a rational agent would ever choose to acquire. Gathering information has a cost, and like any other commodity it will be purchased (by money, time or both) up to the point at which its marginal benefit equals its marginal cost. Further, the PFH cannot be considered an intellectually serious argument because

even if information were costless, it presupposes an impossibility, that with enough information one could accurately know the future. The fundamental difference between the past and the future is that the past has occurred and the future has not. The only way to be sure of what will happen tomorrow is to wait for it to occur. Were this not the case, there would be no need for the word 'accident'. Perfect foresight is not a hypothesis in the strict sense, but an invocation of the impossible.

Alternatively, one could adopt the static expectations hypothesis (SEH), in which it is assumed that agents act as if the future will be like the present. This hypothesis at least meets the minimum test of credibility, and an example is the famous Cobweb solution to market clearing in comparative static partial equilibrium analysis. Since it allows for false trading, the SEH would not serve for general equilibrium models. A variation on the SEH is the adaptive expectations hypothesis (AEH), according to which agents determine their expectations of the future on the basis of experience of the past. Expectations are 'adaptive' because as each period passes predictions of the future are adjusted in light of most recent experience. Previous experience is not ignored, only discounted to some degree. As should be obvious, the AEH results in less volatile models than the SEH. If a dramatic change occurs in the economy, an agent governed by the SEH will respond with an equally dramatic adjustment, on the belief that the change will persist. An agent subject to the AEH will move more cautiously, with behaviour partly governed by past trends and fluctuations. The AEH literally 'smoothes things out'. A well known example of use of the AEH was Milton Friedman's argument that monetary policy is ineffective in the long run.¹

9.2 The Rational Expectations Hypothesis

The rational expectations hypothesis swept away all before it. This was partly due to its fundamental difference from the other expectation hypotheses. In contrast to the other hypotheses which postulated stylised behaviour of economic agents within the context of formal models, the REH purported to specify the actual behaviour of agents

¹ Friedman's argument is treated in many places (see Shaw 1984).

with regard to real world influences. Specifically, it sought to establish a relationship between agents' expectations and empirical outcomes of the economic system. As a result of this difference, the REH must be assessed against criteria different from those used for the other hypotheses. In the case of the first three, it is not appropriate to demand that they satisfy the test of realism, though they should be credible, for they are logical exercises. In the case of the REH its own assumptions demand it to stand or fall on the test of realism.

The REH can be simply stated: 1) if economic and social relations are deterministic;² 2) if all aspects of these deterministic relations are known (complete knowledge of economic and social relations is called the 'formal model' of the economy); 3) if economic agents form their predictions of the future on this complete knowledge;³ then 4) the predictions (expectations) formed in this manner will on average be correct and any divergence between anticipated and actual outcomes will be the result of random influences.

There are three serious difficulties with the REH. First, it presupposes a strict dichotomy between systematic and random influences which at best is a naïve and simplistic approach to causality. It asserts that what is known represents the sum of systematic influences and all unknown influences are random events. This places an

² The REH is a deterministic theory by the definition employed in the physical sciences. Max Born, the famous physicist, wrote, '*Determinism* postulates that events at different times are connected by laws in such a way that predictions of unknown situations (past or future) can be made'. He distinguishes determinism from causality, defining the latter as follows, '. . . there are laws by which the occurrence of an entity B of a certain class depends on the occurrence of an entity A of another class, where the word "entity" means any physical object, phenomenon, situation, or event. A is called the cause, B the effect.' He goes on to argue that causality does not imply predictability (determinism). The REH makes no reference to this fundamental distinction (Born 1949, 9).

³ By neoclassical rules it may not be rational for all economic agents to form their expectations in this manner, because of information costs. The REH explicitly recognizes this point, but incorporating it into the analysis proves of no consequence. It is assumed that virtually all agents form their expectations rationally either from their own complete knowledge or via intermediaries. See discussion of wage bargaining below.

unbearable burden of identification upon the theoretical analysis. Only if the theory has completely and correctly specified all relevant behavioural relationships, and estimated them correctly with accurate data and unbiased specification can the unexplained residual be considered purely random.

The REH assertion that there exists full and complete knowledge of the working of an economy is quite astonishing.⁴ The assertion is that there exists ‘the economic agent who fully understands how the economy actually operates (Shaw 1984, 52), having obtained this knowledge from the discoveries of economic science. This claim, that economics has revealed the true and complete operation of the capitalist economy, is of a type made by no other intellectual discipline be it a social or a physical science. The physical sciences, where new discoveries continuously challenge the existing body of accepted truth, are considerably more humble in their claims.⁵ The literal omniscience of neoclassical economic theory is asserted, that it has discovered all one needs to know about the economy at any moment. A cynic might say that the enthusiasm with which the profession has embraced the REH might in part be explained by the pleasing effect of the hypothesis upon the professional egos of economists. While the perfect foresight hypothesis postulated the impossible achievement of knowing events prior to their

⁴ And apparently it had existed for some time, since the new classical economists have used the REH to analyze the US Great Depression of the 1930s.

⁵ The defenders of the REH might ponder the following statement by a mathematician:

All science is full of statements where you put the best face on your ignorance, where you say: true enough, we know awfully little about this, but more or less irrespective of the stuff we don't know about, we can make certain useful deductions. Now, my view is that any theory which pretends to comprehend everything breaks down on this point. It will be a uselessly rigid theory because it won't have a place into which to put new things. . . . [W]e ought to so shape our theories that new discoveries won't upset *every* theory we have and for that purpose we must have plenty of *open* theories. (Bondi 1967, 11).

This view directly contradicts the neoclassical obsession with ensuring that all models are 'closed', with no loose ends. Hahn takes the sensible and modest view that in economics understanding does not imply precognition. ‘It is plain that we can claim understanding of an event without claiming that we can predict it. Geophysicists, for instance, believe that they understand earthquakes but cannot predict them. . .’ (Hahn 1984, 4).

occurring, the REH posits the naive incredibility of complete knowledge. If it is the case that economic science in the second half of the twentieth century reached the sublime state in which it correctly and completely modelled the capitalist economy, economists did not agree upon what that correct and complete model might be.⁶ Relevant is the cliché that if all the economists in the world were laid end-to-end, they would fail to reach a conclusion. Thus, on many grounds, scientific method,⁷ state of knowledge, and the intense controversies within the economics profession, it is not credible to presume that a correct and complete model of the capitalist economy exists as a reference for economic agents.

⁶ Hahn, for example, writes, ‘...[I]t is by no means the case that [economists] are agreed that the IS-LM cross is a generally accepted theory of the economy’ (Hahn, 1980, 1). Shaw offers an ingenious solution to this problem.

If professional economists can disagree as to what should constitute the appropriate definition of the money stock, how does the proverbial man in the street determine whether a money supply change has occurred or not?...Unable to understand or fathom the all important changes occurring in economic variables, [people in the street] fall back upon the consensus of opinion [*sic!*] in the news media. (Shaw (1984, 54)

So while professional economists cannot agree, financial journalists can produce the correct model out of the controversy.

⁷ In one important branch of science, quantum theory, the inherent indeterminacy of the material world is central to the analysis. Referring to the treatment of quantum theory by Heisenberg, Bohm wrote,

The fact that quantum theory implies that *every* process of measurement will be subject to the same limitations on its precision led Heisenberg to regard the indeterminacy relationships...as being a manifestation of a very fundamental and all-pervasive general principle, which operates throughout the whole of natural law. Thus, rather than consider the indeterminacy relationships primarily as a deduction from the quantum theory in its current form, he postulates these relationships directly as a basic law of nature and assumes instead that all other laws will have to be consistent with these relationships. (Bohm 1957, 83, referring to Heisenberg 1930, 3)

The particular indeterminacy relationship referred to in the quotation is the problem of simultaneously measuring the position and momentum of sub-atomic particles.

When suggesting behaviour on the part of people which is *prima facie* incredible, neoclassical theory frequently seeks to establish credibility through an ‘as if’ statement. For example, in consumer theory it is argued that the analysis does not require that people know their utility functions and to maximize them subject to their budget constraint, but only behave ‘as if they did’. A similar argument is advanced in the case of cost-minimizing firms. The ‘as if they did’ treatment has been applied to the REH.⁸ In the case of consumer theory the ‘as if’ can be justified on grounds that the assumption of utility maximization is tautological: all behaviour is consistent with utility maximization, since one can always argue that the person in question would not have selected a particular action in the market had it not brought him or her the maximum marginal gain. In the case of the theory of the firm, one might argue that cost minimization is forced upon capitalists by competition, those who do not behave in this manner are driven out of operation.

Neither of these justifications applies to the REH. Presuming people to have complete knowledge of the economy is not tautological, since the REH itself grants that even under the best of conditions some people will not behave as the REH predicts. Further, it is not correct to assume that mistakes in forecasting will necessarily lead people to close in on the correct model by trial and error, though some authors argue this.⁹ However, the argument that failing all else people can arrive at the correct model

⁸ ‘Nor is it necessary for economic agents to know the true model of the economy. All that is required is for them to form their expectations in the aggregate *as if* they did know it.’ (Shaw, 1984, 57) Emphasis in original.

⁹ ‘[The REH] does not imply that individuals should not make systematic errors. This does not imply that individuals invariably forecast accurately...[but] rather the assertion is that guesses about the future must be correct on average if individuals are to remain satisfied with their mechanism of expectations formation’ (Begg, 1982, 29). Hahn was unimpressed by this learning-from-experience argument.

Rational Expectations themselves are justified by the argument that rational agents will learn what is the case. The argument is ill-founded in theory for it must be shown that agents could learn. Just as classical general equilibrium theory has never been able to provide a definitive account of how equilibrium prices come to be established, so rational

by trial and error is the last line of defence of the REH. This final defence assumes what it seeks to prove and is theoretically invalid.

First, we consider the proposition that a rational agent could ‘close in on’ the correct model by noting discrepancies between his or her predictions and actual outcomes. To do this, first assume the world to be strictly deterministic and that the hypothetical agent *does* know the correct model. In such circumstances, that each chronological event is unique, individual behaviour never repeats itself in precisely the same circumstances, would create no problem. A change in the tax rate on households, for example, would be correctly anticipated as having the same impact whether prices were rising or falling. If, however, one has the wrong model in mind, one cannot properly hold to the ‘other things constant’ assumption. One might sometimes generate the right prediction by accident or for the wrong reason. In any case one would be unable to distinguish between which forecasting errors were the result of wrong specification of the model and those which were the result of random influences displacing predictions made on the basis of a correct model. This problem with the ‘trial and error’ argument can be put another way. The REH itself implies that people's predictions will more often be off target than they will hit the bull's-eye; the hypothesis is that they will be correct on *average*. In order that a person reformulate his or her model on the basis of off-the-mark predictions, it must be known which deviations of predicted from actual outcomes are systematic modelling errors. If it is the latter, something must be done to the model to correct them. If the former, the missed outcomes are random deviations from the true mean in which case nothing should be done to the model. Without the ability to distinguish between the two error sources, the REH agent could spend time reformulating a correct model or resting complacently in the mistaken belief that systematic errors were only random ‘noise’.¹⁰ In summary, an agent can successfully use trial and error as a

expectations theory has not shown how, starting from relative ignorance, everything that can be learned comes to be learned. (Hahn, 1984, 82)

¹⁰ The size of the difference between predicted and actual outcome is no guide to whether the prediction was correct but randomly displaced or a systematic error. According to the rules of the REH, random deviations from correct predictions will be normally distributed around a mean of zero, but the ‘tails’ of the normal distribution have no upper or lower bounds.

method of establishing the correct model only if the agent knew the correct model in the first place.

Closely related to the above, *even in theory* each prediction made by the REH agents is a unique, ‘one-off’ exercise. The REH agent is in effect operating with an econometric model estimated from historical data,¹¹ and also incorporating key information about the future such as government policy changes. An elementary principle of econometrics is that the unbiased probability distributions of the estimated parameters of a model refer to *hypothetical* outcomes, because there is only one actual outcome, except in science fiction stories involving parallel worlds. No competent econometrician would argue that an econometric model could be arrived at through trial and error. On the contrary, the whole body of econometric theory denies such an *ad hoc* approach. We know in theory that there are no alternative outcomes for the rational agent to observe. Yet it is such a theoretically invalid approach that is defended in the REH literature.

Using the REH in economic models involves what Coleridge called ‘willing suspension of disbelief’, which is a pleasant ingredient when reading fiction but of questionable appropriateness when constructing economic models. To give some spurious verisimilitude to the REH, its practitioners tend to employ extremely simplistic models, notwithstanding the assertion that agents are supposed to have complete and full knowledge of how the economy operates, and not merely some simple analogue. The policy implications of the REH, particularly those reached by the new classical economists, almost invariably follow from extremely simple and sometimes logically flawed False Dichotomy models.

9.3 The New Classical Economics and the REH

Pre-Keynesian classical economics was characterized by its faith that capitalist economies tended automatically to adjust to full employment equilibrium in some chronological ‘long-run’ period with money strictly neutral. The new classical

¹¹ Shaw is quite clear about this, ‘Assuming [the REH agent] uses [his] information efficiently, his prediction or expectations will be identical to the mean value of possible outcomes generated *by the relevant theory.*’ (Shaw, 1984, 58, emphasis added.)

economics takes the same full employment, money neutral position, but argues that it applies to the short run. In other words, the new classical argue that deviations from full employment equilibrium *in actual practice* will tend to be minor. A favourite situation considered within the REH hypothesis involves a presumption of aggregate money wage bargaining between capital and labour in a context in which the only change is in an autonomous money supply.¹² The typical model has only three equations, an IS curve, an LM curve, and an aggregate supply of output curve (see Akerlof 1979). The last of these is specified in terms of a single commodity.¹³ That most workers might not know the ‘true’ model was brushed aside by the contention that their trade union representatives have done the homework to arrive at full and complete knowledge.¹⁴ On the other side of the table, capital is presumed to have knowledge of the same model linking the nominal variables in the economy to the real ones. Let us suspend disbelief, for example ignore that economists cannot agree on precisely how the economy operates, and inspect how this simplistic model is used in the hands of the new classical economists.

As said, assume an aggregate wage bargain in which both sides to the bargain possess the unique complete formal model of how the economy works. Further assume that all prices are flexible, so that at the time of the wage bargain the commodity market and labour market are in equilibrium. The assumption of equilibrium involves the introduction of a concept central to the new classical economics, ‘the natural rate of unemployment’ and its close companion ‘the natural rate of output’.

¹² Shaw wrote (1984, 55) ‘. . . much of rational expectations theory is concerned with the behavior of labour in negotiating formal wage contracts’, and this can be verified by reference to the seminal REH literature (see Sargent and Wallace 1975, and the original source, Muth, 1961).

¹³ ‘New classical market clearing models gain greatly in elegance and tractability by assuming a one-product economy...’ (Shaw 1984, 74).

¹⁴ ‘...[T]he trade union leadership will pay very close attention to crucial economic variables in the economy. They will possess a highly sophisticated model of how the economy behaves and employ highly qualified economic advisors. . . Through the proxy of trade unions many economic agents are acting in accordance with the rational expectations postulate’ (Shaw 1984, 55). This presumes that the true model is known and agreed upon by “highly qualified economic advisors’.

The two concepts represent the naturalistic tendency of neoclassical economics in its most blatant manifestation. By whatever definition, unemployment is not ‘natural’ and use of the term is purely ideological. As argued in Chapter 8, the necessary condition for unemployment is that workers do not own the means by which production is carried out. If they did, they would have no need to offer their services for sale. One may think that capitalism provides the best of all worlds, but workers without property is no more natural and ordained by nature than slavery was.

Second, by the definition used in the new classical economics unemployment cannot be natural. In the abstract, the ‘natural’ rate is defined as the rate of unemployment which prevails when the labour market is in equilibrium.¹⁵ Since equilibrium is an ideal state which the actual economy only approximates, equilibrium unemployment is also an ideal concept. Michelangelo's David may be a beautiful representation of the human figure, but it is not a natural one. Third, the empirical manifestation of unemployment cannot be natural in the sense of having been generated by forces of nature outside the evolution of human beings. As an empirical category, the ‘natural rate of unemployment’ is supposed to refer to those people who voluntarily chose to be without employment. The ‘natural rate’ hypothesis explains such a choice by people on the basis of optimising behaviour. For example, a person may chose not to work at the prevailing wage because the cost of relocating to take an available job may be too great, or the prevailing wage may lie below the worker's customary wage, making it rational to wait some period of time in hope of a better offer materializing. Such decisions are crucially influenced by the institutions of society, such as the level and duration of unemployment compensation, access to retraining programmes, and discrimination on the basis of sex, age and ethnicity. Indeed, the new classical economists point to unemployment compensation as being in part the cause of ‘voluntary’ unemployment. These factors can be changed by legislation and government

¹⁵ ‘When we say that the labour market clears, we do not mean that measured unemployment is literally zero. Rather, we mean that no individuals are voluntarily unemployed in the sense that they are prepared to work at the going wage, but cannot find employment. Friedman has termed this full employment rate of unemployment the *Natural Rate of Unemployment*’ (Begg, 1982, 136, first emphasis added).

decree. It makes no sense to call a rate of unemployment ‘natural’ when it can be altered by passing a law or winning a class action in a court.

It might be thought that much is being made out of a purely semantic issue. However, there is a fundamental theoretical issue here. The term ‘natural rate of unemployment’ as it is used by the new classical economists is nothing other than full employment equilibrium. To call it what it is, full employment equilibrium, identifies it as an ideal concept, a product of an abstract economic model which incorporates a number of extremely problematical concepts, such as the aggregate production function and an exogenous money supply. Full employment in the sense of there being no one who wishes to work at the going wage but cannot find employment may not exist outside of the arcane models of neoclassical economists. It is a hypothesis.¹⁶ Invoking the word ‘natural’ reflects an attempt to repackage an extremely dubious concept to make it more acceptable. The repackaging has been a success. The term has gained wide respectability within the economics profession despite the objections of a number of prominent neoclassical theorists.¹⁷

Let us accept the ‘natural rate of unemployment’, and investigate the new classical economics wage bargaining story. To avoid misrepresenting the story, we shall follow closely a standard presentation. Recall that the correct and complete model of the economy is assumed to be known by both capital and labour. The story goes as follows,

[T]he equilibrium expected real wage at the date of the nominal wage bargain is made is assumed to be set in the expectation of clearing the labour market. . . . Thus I assume that nominal wages are set each period to produce an expected real wage which is expected to generate unemployment at the Natural Rate. . . (Begg 1982, 37)

The assumption of full employment is made from the outset. The postulated situation bears no resemblance to what occurs in any actual economy. Very few capitalist economies have aggregate wage bargaining, and in most Western capitalist countries the majority of wage and salary earners are not organized into trade unions. In the United

¹⁶ Shaw, whose book is quite balanced in its judgment on the REH, explicitly recognizes the hypothetical nature of the ‘natural rate’

¹⁷ Hahn called ‘the natural rate of unemployment’ an ‘unproven assertion’ (Hahn 1980 and 1982a).

States, for example, hardly more than a ten of the workforce is covered by effective bargaining units. Second, the assumption is made that the parties to the wage bargain seek a nominal wage which will clear the labour market. This is an arbitrary assumption, and a strange one to be made by new classical economists. For decades neoclassical economists argued that trade union leaders tended to be most influenced by their direct constituency, the dues paying members, and showed little concern for the non-union employed, much less the unemployed. It is unclear what prompts the new classical economics to attribute such selfless motives to trade union leaders throughout the capitalist world. The assumption that a wage is set to clear the labour market is nothing other than the Walrasian auctioneer disguised in a blue collar and cloth cap.

Third, the assumption is implicitly made that there is no conflict of any significance between capital and labour, because both parties to the bargain seek the wage which will clear the labour market. What is being described in fact involves no bargaining at all. Since by the REH both capital and labour know with certainty the true model of the economy and both seek to establish the full employment real wage, it would be a waste of time for them to meet. The trade union leaders could confidently leave wage setting to the capitalists (and *vice versa*) since both parties have the same information and seek the same result. Completely ignored is that the wage bargain in part involves a struggle over the distribution between wages and profits.

While the story has more superficial realism than the general equilibrium parables in previous chapters, it is no closer to reality. It is that same general equilibrium thought experiment disguised as a real world process, and the REH is incidental to the story. It must be stressed that this story is not merely an exercise in abstract model building, but has pretensions to explain actual events. In its attempt to do so, it begins by assuming that the labour market is in equilibrium. This assumption requires that all markets have cleared according to Walrasian rules. Walrasian market clearing requires the assumption of perfect foresight to avoid false trading, either in the form of the PFH or a mythical auctioneer. Rather than replacing the PFH, the REH is introduced *in addition* to the presumption of perfect foresight. The assumption of perfect foresight is required to

ensure the market clearing that establishes full employment each market period,¹⁸ and the REH merely provides a spurious link between one market period and the next.

The implicit necessity for the PFH can be demonstrated via a thought experiment. Again, recall that here we deal with an analysis alleging to refer to real world outcomes, not merely theoretical possibilities in the abstract. Assume that at the outset of a market period agents establish their predictions upon the basis of a complete and correct model. If able to do so a large number of times, they will on average predict the general equilibrium outcome. However, in any particular case, random influences will result in the actual outcome differing from general equilibrium, and false trading will occur. Further, each prediction exercise is a unique event which can never be repeated in practice. Hypothetically there exists an average of the many outcomes which is equal to the general equilibrium outcome. But each market period is unique, so the theoretical existence of a zero mean in deviations from general equilibrium is of no help in avoiding false trading, for now the argument refers not to an abstract model but to the real world.¹⁹

Even were it the case that the REH yielded general equilibrium for one-off events, the approach is unsatisfactory. As shown in previous chapters, full employment general equilibrium is a theoretically fragile concept requiring a number of problematical assumptions and concepts. Pre-REH neoclassical theorists for the most part felt it incumbent upon themselves to demonstrate the existence, uniqueness, and stability of general equilibrium. The new classical economics takes full employment equilibrium as its starting point.

¹⁸ Shaw wrote, 'The rational expectations thesis departs from the classical equilibrium framework [Walrasian general equilibrium] in one very important respect. It does *not* assume that all economic agents possess perfect knowledge of all market conditions' (Shaw, 1984, 67). This is incorrect, because the REH predictions are based on a 'full model' of an economy.

¹⁹ Begg demonstrates that the REH produces a solution that converges to general equilibrium which is formally equivalent to the PFH. The proof has no relevance for *actual* predictions of future variables, however, since it presumes that the parameters of the 'correct model' remain unchanged over many time periods. This is a perfectly legitimate procedure for an abstract model, but will not serve to justify market-clearing in the real world in which each time period heralds a new and unique event.

9.4 The New Classical Economics and Policy

With these critical comments in mind, we can turn to what are considered the policy conclusions of the new classical economics story. Perhaps the most remarkable aspect of these policy conclusions is that they have been taken seriously and had practical impact. Recall that the wage bargain was struck in the context of full employment with both parties seeking a money wage which will preserve that full employment in the next time period. To continue the story,

Under Rational Expectations, the remarkable implication. . . is that, no matter how we define the rest of the model and no matter which systematic parts of the [government economic] policy rule are altered, the effect on the path of real output will be nil.²⁰

The story apparently has the following moral: if agents act according to the REH rules, no matter what the characteristics of the formal model of the economy, no systematic government economic policy will have any effect upon real output and, therefore, employment during the life of the wage contract. This statement is false. To understand why it is false, first we investigate the conditions under which it would be true. Assume that the government plans to increase the money supply during the period when the wage agreement applies. If the increase is based upon some reasonable and systematic policy guidelines, then it will be anticipated by the parties to the aggregate wage bargain. In anticipation of the implementation of the policy rule, the bargainers will agree on a nominal wage which clears the labour market with the specific policy in mind. For example, if the government plans to increase the money supply by ten percent, the bargainers will set a market clearing nominal wage consistent with this change in the money supply. On the assumption that the wage bargainers do this, under what circumstances will there be no effect upon real output? *This will result if and only if*

²⁰ Begg (1981, 137). The last clause in the quotation is misleading. Since the story being told is about static equilibrium states, the precise statement would be, 'the effect on the level of real output will be nil'.

*money is strictly neutral.*²¹ In other words, application of the REH tells one nothing that economists have not known for at least two generations: if the economy is at full employment equilibrium and money is neutral, a change in the money supply will leave all real variables unchanged. The ‘remarkable’ REH conclusion is the neutrality condition and nothing more. It differs from the same story told in traditional Walrasian market theory by the replacement of the all-knowing auctioneer with all-knowing wage bargainers. The economic policy nihilism of the new classical economics is a repackaging of the economics of Pigou, Keynes's famous theoretical adversary.

The quotation is wrong in the first instance because there are many specifications of how the economy operates in which money is not neutral. If one were allowed non-neoclassical specifications, there are the models of the neo-Ricardians, neo-Keynesians and Marxists. But even if respectability is granted to neoclassical models alone, it was shown in Chapter 7 that introduction to the wealth effect can render money non-neutral.²² If money is non-neutral, then the hypothetical ten per cent increase in the money supply will alter the rate of interest, directly affecting real investment and consumption. If the supply of labour is sensitive to the interest rate, then the market clearing level of employment will change.

Second, even on the assumption that money is neutral, it is not true that changing systematic policy rules will have no effect upon real output, for there exist fiscal policy rules which even if unchanged would affect real output. If the tax structure is progressive, then a rise in nominal wages and prices will increase tax revenue more than

²¹ It is no accident that REH-new classical economics stories are frequently told using the model of the simple quantity theory (see Shaw, 1984, 3-7). Such examples prove nothing, even in the abstract, because they incorporate the false dichotomy.

²² The inclusion of the phrase, ‘no matter how we define the rest of the model’, seems to be a slip of the pen on Begg's part. Elsewhere he argues cogently that introduction of the wealth effect cancels the ‘remarkable’ conclusion of the new classical economists: ‘Provided there remains a real balance effect on consumption, systematic monetary policy will feed back through into the goods market, thereby affecting the level of investment required for market clearing,’ and ‘if monetary policy can alter the real steady state [full employment equilibrium] it will generally have real effects’ (Begg 1981, 149, 147).

proportionately to the rise in money income. In a neoclassical world a higher average tax rate for the economy would affect the work-leisure trade-off and shift the supply of labour schedule (Hahn 1980, 2).

Pre-Keynesian classical economics was forced to retreat before the attack of Keynes, and remained largely an undercurrent during the heyday of the neoclassical synthesis. Its two central messages, the neutrality of money and automatic full employment equilibrium, were treated with considerable scepticism by policy oriented economists. The new classical economics has changed this, and the believers in full employment and neutrality again seized the high ground of economic theory, on the basis of the REH. Upon inspection one finds that the REH resolves none of the theoretical problems which plagued both the old classicals and the neoclassicals; rather, it adds additional logical problems of its own. Its popularity in the profession was largely a political phenomenon. With the election of right-wing governments in the United States and the United Kingdom in the 1980s, the new classical economics was a doctrine whose time had come, its theoretical failings notwithstanding.

9.5 Evaluating the New Classical Economics

Having been quite critical of the new classical economics and its rational expectations medicine, we must give it its due. While many liberal and progressively minded neoclassical economists were appalled at the right-wing policy nihilism of the new classical economics, the latter can with some justification claim to be the true standard bearer of the neoclassical synthesis tradition.

For at least thirty years after the end of the Second World War there existed a strong consensus among mainstream economists with regard to macroeconomics. In the realm of high theory, a successful counter-attack was launched against *The General Theory*. It was accepted in the profession that Keynes had done little more than demonstrate that rigid money wages would prevent full employment from being automatically achieved in a capitalist economy.²³ However, this theoretical victory of the

²³ Even before the end of the Second World War, Modigliani provided the summary statement which would become the keystone of the neoclassical synthesis.

pre-Keynesian paradigm appeared singularly hollow, because the other part of the consensus was that money wages were rigid in practice. So while those who held to the pre-Keynesian paradigm were left to pursue their interest in the analysis of full employment equilibria if they wished, practitioners of economic policy and macroeconomic empirical studies devoted themselves to situations of less than full employment and developing rules for interventionist policies of governments. With the exception of a few graduate schools, young economists-in-training were required to learn the intricacies of full employment solutions as something to get behind them in order to go on to the serious work of analyzing situations involving unemployment and what could be done about it. Walrasian general equilibrium theory was frequently ostracized to no more than a topic within advanced courses in microeconomics (which, one can note, is where Walras himself had located it).

The decline in influence of what Keynes had called classical economic theory reflected the political environment of the post-war period, which was generated in the developed capitalist countries by two traumatic events, the Great Depression of the 1930s and the Second World War. The most developed capitalist country, the United States, suffered the greatest economic decline during 1929-1933, and another highly developed capitalist country, Germany, unleashed organized barbarism on a historically unprecedented scale on own population and its neighbours. One did not have to be a communist or even a social democrat to believe that modern capitalism required government intervention to control its more flagrant economic and political abuses (see Rothschild 194?). However, the pragmatists of less-than-full employment had few theoretical differences with the general equilibrium idealists, particularly in the United States. Further, the so-called frontier of macroeconomic theory was dominated by

It is usually considered as one of the most important achievements of the Keynesian theory that it explains the consistency of economic equilibrium with the presence of involuntary unemployment. It is, however, not sufficiently recognized that. . . this result is due entirely to the assumption of 'rigid wages'...(Modigliani 1944).

The thinly-veiled disdain here ('usually considered', 'due entirely to', and 'rigid wages' in quotes) indicates the low esteem in which Keynes's contribution was held by some even before he died in 1946.

Walrasian methodology. For thirty years a split personality characterized by a split personality characterised mainstream macroeconomics: it swore theoretical allegiance to Walras, but unceremoniously abandoned him when treating concrete policy. Economists such as Joan Robinson on the Left and Milton Friedman on the Right pointed out the discipline's contradictions between its theory and practice, but made little headway in obtaining a consensus for rendering the two consistent. Perhaps like the Catholic Church, the profession flourished on the basis of rigid doctrine in the Vatican and heterodoxy among the clergy.²⁴

In the name of reaching a concordance between microeconomics and macroeconomics, the economics of Walrasian full employment achieved complete *theoretical* ascendancy over the economies of effective demand, involuntary unemployment, and systemic instability. By the mid-1950s, the theoretical core of economics was again general equilibrium. What the new classical economics united theory and practice. If theory tells one that the natural working of the market mechanism will produce full employment and the government is a burden upon the economy, and if that theory is accepted as the collective wisdom of the profession, an economist should treat the world accordingly.²⁵ In the new classical economics neoclassical theory finds its purest expression and ran its course to its logical and practical conclusion.

²⁴ But there was much heterodoxy, at least in the United States. In the 1950s there were only two Marxist economists at a major American university, Paul Baran of Stanford and James Becker of New York University. After Baran's death Becker was the only one for several years.

²⁵ The difficulties in maintaining an interventionist position while accepting general equilibrium theory is well treated in Milgate and Eatwell (1983).

10 Full Employment and Multi-commodity Production

10.1 Introduction

At a number of points in previous chapters we referred to critiques of the neoclassical model which involve the use of an aggregate supply of output function. We now treat that issue in some detail, particularly those objections that have come from writers who feel that the neoclassical synthesis is a serious distortion, even a perversion, of Keynes's contribution to economic theory. The purpose is not to cover all critiques arising from writers who considered themselves as correct interpreters of Keynes, but rather to restrict the discussion to those who address certain broad and fundamental issues of theory.

Keynes explicitly accepted marginal productivity theory,¹ but at a number of points in *The General Theory* he made arguments and comments that contradicted the concept of a neoclassical production function,² either aggregate or at the firm level. One group of economists which saw itself in the tradition of Keynes judged his acceptance of marginal productivity theory to be a fatal theoretical and tactical compromise. Central to their critique of the neoclassical synthesis was their attack upon the aggregate production function. This group of writers, among whom the late Joan Robinson is the most distinguished, we shall refer to as the 'neo-Keynesians'.³ A brief word on varieties of Keynesians is necessary, for there is a second group critical of the neoclassical model, some of whose members share the scepticism about the aggregate production function.

¹ Keynes explicitly accepted what he called 'the first classical postulate', which he summarized as follows, 'the wage is equal to the marginal product of labour' (Keynes, 1936, 5ff).

² The term 'output/income function' was used to refer to $y = y(k, n)$. This term was used because in neoclassical models y equals total value added. In this chapter we revert to the conventional term, 'aggregate production function', because the debate summarized in the next section is over whether $y = y(k, n)$ can be treated as summarizing production relations.

³ The terms became confused. Eichner and Kregel, for example, claim the 'post-Keynesian' for an analytical model which derives its inspiration from Joan Robinson and Nicholas Kaldor (Eichner and Kregel, 1975). *The Journal of Post-Keynesian Economics* includes the Robinson-Kaldor school in its title. Before the term post-Keynesian came into general use, these two economists and like-minded theorists were referred to as neo-Keynesian. See Harcourt (1972).

However, this second group centres its critique of the synthesis model on the general equilibrium analysis of Walras' Law. Here major writers were Clower and Leijonhufvud. Their approach we call 'disequilibrium-Keynesian' and is treated in the next chapter.⁴ Both groups might be called 'post-Keynesian', a catch-all category which we shall avoid.

At the risk of over-simplification, the theoretical position of the neo-Keynesians can be summarized as follows. They sought to reconstruct the analysis of *The General Theory* in terms of a macro analysis which discarded the concept of an aggregate production function. In this approach, the neoclassical treatment of capital-labour relations as a harmonious one determined by purely technical influences (the production function and factors supplies) is rejected in favour of placing the distributional struggle between capital and labour at the centre of the theory.⁵

10.2 Switching Techniques and the Factor Price Frontier

A basic tenet of neoclassical theory is that holding other things equal, more employment can only be achieved at a lower real wage. This is a powerful ideological message, for it implies that attempts by workers to improve their conditions of pay, if successful, will be self-defeating by generating unemployment.⁶ If the labour market is

⁴ Some economists, particularly those disposed to the Robinson-Kaldor school, objected to the use of the word 'Keynesian' to identify this second group. Brothwell (1976), for example, preferred calling them 'neo-Walrasians', for reasons explained in the next chapter.

⁵ In this respect, the neo-Keynesians had some aspects of their analysis in common with the 'neo-Ricardians'. The latter, however, place their analysis of distribution within a gross product framework (i.e. they consider intermediate costs as well as value added, Sraffa 1960). Those we later call disequilibrium Keynesians have little in common with the neo-Ricardians.

⁶ Following closely on this conclusion is the argument that the distribution between profits and wages is technically determined, a position first worked out in detail by John Bates Clark in his 1899 book, *The Distribution of Wealth* (reprinted by Harvard University Press in 1988). If one takes as given the aggregate production function, the supply schedule of labour, and the capital stock, and if money is strictly neutral, then the profit share and wage share are uniquely determined in full employment equilibrium. Aggregate distribution will not be treated here. For an excellent discussion of the implications of the Capital Controversy for the theory of distribution, see Fine (1980, 109-113).

left to operate freely without interference, full employment will result. Intervention can only result in the employed gaining at the expense of an increased number of the unemployed. Further, society as a whole loses, because unemployment implies that total output is below its maximum level. This argument, that there is a trade-off between the level of the real wage and the level of employment, derives directly from the concept of the aggregate production function.

In order to be clear about what is at stake in the debate over the aggregate production function, a detailed investigation of how the real wage-employment trade-off is supposed to occur is necessary. On the supply side of the macro model, neoclassical theory begins by assuming that the total production of the economy can be treated as a single product. It then postulates that at any moment there exists a known range of techniques that can be used to produce this single commodity. This known range of techniques is usually referred to as 'the state of technology'. All of these techniques are part of the same production set, and differ from each other by the ratio in which capital is combined with labour. Each technique is economically efficient in that at some ratio of the wage to the rate of return on capital each will produce the single commodity at the lowest cost. Therefore, the aggregate production function represents a locus of many techniques, all of the possible capital-labour combinations which are economically efficient. Further, capital-labour substitution always involves the full use of the capital stock, since it is always rational for capitalists to engage their entire capital, whatever might be the labour input (see Chapter 8).

As one moves along a production function, as in the stories told in Chapters 5 to 7, one is not simply substituting labour for capital (or *vice versa*), but switching techniques. No one seriously argues that a given production process allows a wide range of capital-labour ratios. It may be that some production processes do, but this is an empirical issue and cannot be the theoretical basis of capital-labour substitution. The theory of capital-labour substitution asserts that there exists a book of blueprints of many possible production alternatives, and when the factor price ratio changes, optimizing capitalists are prompted to switch to a different technique.

The above discussion is illustrated in Figure 10.1, which shows the aggregate production function in three manifestations. A map that shows four techniques available

for the production of the single commodity, with a given capital stock of k , is represented in Figure 10.1a. A small k is used because the capital stock is measured in units of the single commodity. Each of these techniques, A, B, C, and D, is characterized by fixed coefficients. When using technique A, capital and labour can be combined only in the ratio k^*/n_a . Additional input of labour (adding amount $[n_a - n_b]$ for example) has no impact on the level of output as long as technique A is in place. The straight lines from the origin in Figure 10.1a are called activity vectors. As drawn, equal increments outwards from the origin along any activity vector yield equal increases in output (constant returns to scale). When points of equal output on different vectors are joined, the result is an isoquant (only the level of output y_1 is shown). The isoquants in this diagram differ from those in Figure 8.1 because here they are made up of straight-line segments. Were we to include more activity vectors (techniques) between the existing ones, the isoquants would progressively begin to approximate smooth curves. Even were we to do this, the curves would be constructed on the basis of discrete techniques, each characterized by fixed coefficients of production. Figure 10.1b shows the production function in the output-labour space, again with a series of straight lines whose slopes diminish with respect to the level of employment. Finally, Figure 10.1c presents the implied marginal product of labour schedule, measured in units of the single commodity, though on a smaller vertical.⁷ The marginal product schedule now takes the form of a step-function, with the operative portions of each techniques shown as solid lines. The purpose of this diagram is to demonstrate that the theoretical process by which labour is added to a given capital stock (or, more generally, labour substituted for capital) involves a switch from a fixed coefficient technique with a higher capital-labour ratio to one with a lower capital-labour ratio.

The next diagram, Figure 10.2, is a variation on the one before, in which the *factor price frontier* is derived using all four quadrants. In Figure 10.2a the isoquants are presented as before, with four fixed coefficient techniques. In the quadrant below (Figure

⁷ The production function and marginal product schedule are made up of line segments, and not merely four points, because at levels of employment in between points n_a and n_b , for example, a combination of techniques A and B can be used.

10.2b), the marginal product of labour schedule is derived. In this part of the diagram, one can find the real wage associated with each technique, measured on the vertical axis in units of the single commodity. In Figure 10.2c, the relationship between the capital stock and the rate of return is shown, with r rising as techniques are chosen for which the capital-labour ratio falls. Here there is only one marginal product schedule (as a series of straight lines), because the capital stock is held fixed. Figure 10.2c has a series of shifting vertical marginal product of capital schedules, because labour varies with capital constant.

The shape of the curve in Figure 10.2d is explained by use of algebra. Since output is equal to wages plus profits, one can write for any of the four techniques, $y = wl(i) + rk^*$. Using technique A as an example,

$$y(a) = wl(a) + rk^* \qquad y(a) = wl(a) + rk^*$$

$$w = \frac{y(a)}{n(a)} - r \frac{k^*}{n(a)} \qquad (10.1)$$

and

$$r = \frac{y(a) - wl(a)}{k^*}$$

In this equation, only w and r can vary because there is only one ratio in which capital and labour can be productively used, namely $k^*/n(a)$. Further, the average product of labour, $y(a)/l(a)$, is unique when the entire capital stock is employed. This equation is the factor price frontier for technique A and it is linear. It shows the unique rate of return that is associated with any commodity wage (and vice versa). A factor price frontier can be derived for each technique, and these are shown in Figure 10.2d. As the capitalist producer switches to techniques with more labour relatively to capital, the vertical intercept, y/n , crawls towards the origin, so each successive factor price frontier intersects the previous one at a lower commodity wage and a higher rate of return.⁸

⁸ The point of intersection corresponds to the commodity wage which is equal to the marginal product of the technique intersecting from the right in quadrant 10.2(d). It is to be recalled that for each technique the marginal contribution of labour is constant (though lower for technique B than A, C than B, etc.).

The result of constructing these various factor price frontiers is easily interpreted. If the commodity wage is w_a , then technique A will be chosen by capitalists because it yields the highest rate of return. At some point below w_a technique B begins to offer the highest rate of return. Therefore, when the commodity wage declines toward w_b capitalists will switch from technique A to technique B. Where techniques A and B cross is a 'switch point'. Similarly, when the commodity wage continues to decline capitalists will switch to technique C, and to technique D. We now have the explicit theoretical foundation of the less-than-full-employment stories of Chapters 5 to 7. Assume that the supply of labour is n_c in Figure 10.2. If the money wage is flexible and markets clear according to Walrasian rules, then nominal variables will adjust so that commodity wage in the region in which technique C is most profitable and labour is fully employed. If, however, workers combine to hold the money wage above the market clearing level, the commodity wage would rise, say to a level where technique B is most profitable, the total capital stock is converted to technique B, the maximum level of employment would be n_b , resulting in unemployment.

The moral of the story told in Figures 10.1 and 10.2 is neat, compact, and politically powerful. However, it is a moral based upon a world created by the storyteller; it is not a tale of any actual economy. The entire logical argument presumes a one commodity system, in which the output of the production process is identical to the input which serves as the capital stock. This story of aggregate capital-labour substitution in response to a change in the economy-wide ratio of the commodity wage to the rate of return is, strictly speaking, a parable, '[a] narrative setting forth something in terms of something else, fictitious story told to point a moral...[an] allegory' (Fowler and Fowler 1964, 572). The narrative told in Figures 10.1 and 10.2 is fictitious: economies are not one product systems, no matter how convenient it may be to presume that they are. It is certainly sets forth something in terms of something else, for the actual capital stock of any economy is not homogeneous, nor is it identical to the output it generates.

That economies have more than one product, and especially that capital inputs and consumption outputs are not the same thing, does not in and of itself invalidate the parable. However, the allegorical nature of the aggregate production function requires

that its users demonstrate that the conclusions derived from it are not contradicted when one considers a system with more than one commodity. If it can be demonstrated that the capital-labour substitution story survives the minimal theoretical test of a multi-commodity model, then its judgment on wages and employment can be taken seriously. To be explicit, the theoretical task is not that the aggregate production function should stand the test of realism or even casual empiricism, but that it survive in a model no different from the general synthesis model with the exception that there are two products rather than one. The Neo-Keynesian critique demonstrates that the aggregate production function cannot survive this test.

10.3 The Neo-Keynesian Critique

Before proceeding to a presentation of the Neo-Keynesian critique of the aggregate production function, a brief digression is required. Readers familiar with what has been called the ‘Cambridge Controversy’⁹ might be surprised to find it in a treatment of macroeconomics, especially a treatment of macroeconomics which is restricted to short-run models. As it developed, the debate over the logical consistency and generality of the neoclassical aggregate production function focused almost entirely upon issues of distribution, determination of wages and profits and choice of technique in response to changes in factor price ratios. The critics used their attack upon the aggregate production function primarily as a vehicle to discredit the neoclassical theory of distribution and marginal productivity analysis *inter alia*. The ability of the critique to achieve these formidable tasks is open to question. What is not open to question is the relevance of the critique to short-run adjustment mechanics in the neoclassical macro model. As Hahn points out,¹⁰ it is strange that the critics did not pursue more vigorously the powerful short-run implications of their attack upon the aggregate production function.

⁹ The debate is so called because its two sides tended to coincide with the two Cambridge's, Cambridge, England, and Cambridge, Massachusetts. This particular designation indicates that the protagonists represented the elite of the elite of the economics profession at the time.

¹⁰ Hahn wrote, referring to the Sraffian version of the critique of the aggregate production function, ‘What is at risk is a simplified neo-classical comparative static equilibrium analysis and a simplified neo-classical dynamics. Sraffa's point was a fine technical insight into neo-classical

The analysis begins with a very simple two commodity system in which there is one output, one input, and the input is completely used up each period; i.e. capital has a life of one period. Further, it shall be assumed that the system keeps to the same level of production each period, so an amount of the input is produced that is just sufficient to produce the output. Keeping to the approach used in the one commodity parable, it is assumed that there exists a range of fixed coefficient techniques for capitalists to choose among. Unlike before each technique now involves two products, the input and the output. First, a typical technique A will be defined for one unit of output. The output is designated by the number 1, and the input by the number 2. The price of each product can be defined as follows:

$$p_2 k_{a1} + p_{a1} w n_{a1} + (\text{profit})_{a1} = p_{a1}$$

$$p_2 k_{a2} + p_{a1} w n_{a2} + (\text{profit})_{a2} = p_{a2}$$

where p_j is the price of each commodity, n_{a_i} is the labour input required to produce one unit of each commodity, k_{a_i} is the amount of input (capital) required to produce one unit of each commodity, and w is the wage measured in physical units of the output.

We assume that competition results in the same wage and rate of return in the production of each commodity. The rate of return is defined as $r = rk/k$. In this simple case in which capital has a life of only one production period, the rate of return can be written as price minus cost divided by the input cost. For the output the rate of return is

$r = [\text{price} - \text{total cost}]/[\text{capital cost}]$, where capital cost = input cost

$$r_{a1} = [p_{a1} - (p_{a1} w n_{a1} + p_{a2} k_{a1})]/[p_{a2} k_{a1}] \quad (10.1)$$

As a further step in simplification, the technique will be defined for relative ('normalized') prices, so $p_a = p_{a2}/p_{a1}$ is the price of the input, and the price of the output is unity. Since we shall only consider the case of a constant level of production, it is convenient to define one unit of the input to be that which is produced and used up in a

economics but...[the critics] have not exploited it...[O]n the manner in which an equilibrium is supposed to come about, neo-classical theory is highly unsatisfactory...The remarkable fact is that neither [Sraffa] nor the Sraffians have made anything of this' (Hahn 1984, 383-384). This was first published as an article titled, 'The Neo-Ricardians' (Hahn 1982b).

time period, or $[k_{a1} + k_{a2}] = 1$. Finally, since we are dealing with only one technique in our example, the notation 'a' is superfluous. With these assumptions made, the summary of the technique can be rewritten in the usual form that one encounters in the literature.

$$\begin{aligned} pk_1 + wn_1 + rpk_1 &= 1 \\ pk_2 + wn_2 + rpk_2 &= p \end{aligned} \tag{10.2}$$

or

$$\begin{aligned} [1 + r] pk_1 + wn_1 &= 1 \\ [1 + r] pk_2 + wn_2 &= p \end{aligned} \tag{10.3}$$

The 'factor intensity' of the input or the output is defined as k/n . If $[k_2/n_2] > [k_1/n_1]$, then the input is more 'capital-intensive' than the output. As will be shown below, comparing the factor intensities of different techniques is less straightforward than comparing the factor intensities of the two products within one technique.

The relevance of the above expressions (10.2 and 10.3) for the neoclassical macro model may not be obvious. However, they can easily be converted into the familiar income/value added aggregates. If production of the output is constant, corresponding to IS-LM equilibrium in the neoclassical model, then the production of the input is completely exhausted in the current period by the combination of its use as an input to produce the input and as an input to produce the output. Recalling that equations (10.2) and (10.3) are defined for one unit of output, the price of the input is equal to the value of its production in the current period.

$$p = pk_1 + pk_2$$

The price equation for the input (10.2) is, $pk_2 + wn_2 + rpk_2 = p$. We can make the following subtraction:

$$\begin{array}{r} [pk_2 + wn_2 + rpk_2 = p] \\ - [pk_1 + pk_2 = p] \\ \hline [pk_1 = wn_2 + rpk_2] \end{array}$$

In words, the input cost of the output equals the value added generated in the production of the input. Now one can substitute for pk_1 in the equation for the output.

$$wn_1 + wn_2 + rpk_1 + rpk_2 = 1$$

$$w[n_1 + n_2] + rp[k_1 + k_2] = 1 \quad (10.4)$$

Thus, total wages and profits equal the production of the output, value added equals the value of 'final' products. On the assumption that this technique is characterized by constant returns to scale, expressions (10.4) can be expanded to the level of aggregate output/income (y), and are equivalent to the neoclassical circular flow statement (Section 1.2) that wages plus profits equal final output. Note that $[n_1 + n_2]$ is total labour utilized, $[k_1 + k_2]$ the capital stock, and multiplying by p results in measuring the capital stock in units of the output. What we have been calling a 'technique' is in effect a point on the aggregate production function. If we designate the capital stock in units of the output as k and y as the level of output, then equations (10.4) can be written simply as

$$y = wn + rk \quad (10.5)$$

and

$$r = [y - wn]/k$$

The discussion below treats techniques at a unit level of output, and is strictly equivalent to considering aggregate production on the assumption of constant returns to scale for each technique. This is appropriate, for the purpose of the exercise is to investigate whether techniques involving an input which is different from the output will produce a parable about wages and employment that is the same as in the one commodity macro model.¹¹ To investigate this, one must derive the factor price frontier for two commodity case, as was done before in the one commodity case. We seek the factor price frontier for the technique as a whole, since the two parts of it, the input and the output, form a single indivisible system of production. To obtain this relationship, each element of the technique is solved for p , the price of the input. Then, the price of the input is eliminated by setting the two equations equal to each other.

¹¹ What follows treats only one aspect of what is called 'the Capital Controversy'. The definitive work on the various ramifications and implications of the debate is Harcourt (1972), where it is presented with insight and wit. The core of Harcourt's analysis is found in Harcourt (1969), and reprinted in Hamouda (1986).

$$\begin{aligned}
p &= \frac{[1 - wl(1)]}{[(1+r)K(1)]} & p &= [1 - wn_1]/[(1+r)k_1] \\
p &= \frac{wl(2)}{[1 - (1+r)k(2)]} & p &= wn_1/[1 - (1+r)k_2]
\end{aligned}$$

The price term is eliminated by substitution.

$$\frac{1 - wn_1}{[1+r]k_1} = \frac{wn_2}{1 - [1+r]k_2}$$

This expression can be solved for r and w , the only remaining variables. After some manipulation, one obtains the factor price frontier in the following form.

$$r = \frac{1 - wn_1}{k_2 + w[k_2n_1 - k_1n_2]} \tag{10.6}$$

This equation for the factor price frontier is considerably more complicated than the analogous expressions (10.1) and (10.5). In general it is not linear. The factor price expression (10.6) can be rendered equivalent to the case in which there is only one commodity. If the expression in brackets in the denominator of (10.6) were zero, then $r = [1 - wn_1]/k_2$. The bracketed term will be zero if

$$\begin{aligned}
k_2n_1 &= k_1n_2 \\
\text{or,} \\
k_2/n_2 &= k_1/n_1
\end{aligned} \tag{10.7}$$

The two commodity case reduces to the one commodity case if both products of the technique are characterized by the same capital-labour ratio. This is hardly surprising, since two products with the same factor intensity are one product with respect to production. One can conclude that the two product technique will have a straight-line factor price frontier if and only if the two products are only one. In the general case in which the capital-labour ratios of the input and the output are not the same, the factor price frontier will be non-linear. If the input is less capital-intensive than the output, then the factor price frontier will be bowed in towards the origin, and bulge outwards in the opposite case. These two general forms are shown in Figure 10.3, along with the one product factor price frontier. Some writers refer to the linear frontier as a special case of the two product economy, but this is incorrect. Linearity is the case of a one product system and of no other.

Figure 10.4 presents a two product economy with two available techniques, A and B. For technique A, the output has a higher capital-labour ratio than the input, and for B the input has a higher capital-labour ratio than the output. First, it will be investigated which *technique* is the more capital-intensive, on the basis of the capital-labour ratio. To do this it is necessary to derive a measure of the capital-labour ratio for a technique as a whole, considering both the output and the input used to produce the output. On the basis of equation (10.5), we can solve for the capital-labour ratio for two techniques A and B.

$$[k_a/n_a] = [(y_a/n_a) - w]/r \quad (10.8a)$$

$$[k_b/n_b] = [(y_b/n_b) - w]/r \quad (10.8b)$$

In words, the ratio of the capital stock to the labour employed can be measured as the average product of labour minus the wage, this numerator being equal to capitalists' profit per worker employed, then, divided by the rate of return. Using this method of calculation, it is easily seen in Figure 10.4 which technique is the more capital intensive. At points a and b the two techniques enjoy the same wage and rate of return, differing in terms of expression (10.8) by the value of the average product of labour (y/n). In the diagram the vertical intercept of each technique marks the value of y/n , so one can conclude that technique A is the more capital intensive, for $0a' > 0b'$. This is the result one would expect from neoclassical production theory: the technique for which labour is more productive is the more capital intensive one.

We have employed the basic definition of factor intensity, namely, the capital-labour ratio. It is to be expected according to neoclassical rules that the more capital intensive technique will be selected by capitalists when wages are high and the more labour intensive one when wages are low. Inspection of Figure 10.4 reveals that such is not the case. For a commodity wage above level w_a , technique A offers the higher profit rate, as expected since A is the more capital-intensive. When the commodity wage drops below w_b , technique B is the more profitable and capitalists will switch techniques. All is well until the commodity wage edges below level w_b' . Below w_b' technique A, the more capital intensive, reappears as the more profitable. This reappearance is called the 'reswitching' of techniques. Reswitching implies an unexpected conclusion: theory tells

us that in general capitalists *will not* necessarily select more labour-intensive techniques when wages fall.

This result is a potential disaster for the neoclassical macro model and its parable about real wages and employment. The generally accepted definition of factor intensity breaks down once one abandons a one commodity world. First, it is not the case that more capital-intensive techniques will always be chosen as the real wage rises. Second, and equally distressing for neoclassical analysis, the measured factor intensity of a technique is not determined by technology alone. Close inspection of Figure 10.4 demonstrates this. Consider technique A. Following equations (10.8), when the commodity wage is w_a , the measured capital intensity of technique A is double what it is at commodity wage w_b .¹²¹⁴

This is a strange result, indeed, for it means that changes in the wage and the profit rate alone, with no change in the technical coefficients of production, alter the factor intensity of a technique. This variability of the capital-labour ratio with respect to the distributional variables r and w throws into question a convention that we have employed throughout the first four chapters of this book. All discussion of the short-run macro model was based on the presumption of a given capital stock; a fixed capital stock has been the defining characteristic of the short run. Now it is discovered that the capital stock is not fixed with respect to the distribution between wages and profits except in the case of a one commodity world. It should be noted that this has nothing to do with whether the capital stock treated as homogeneous; i.e. as composed of a single type of machine. In the two commodity model represented in Figure 10.4, the capital stock is completely homogeneous. The conclusion in the two commodity model is bizarre in the extreme: there is only one form of capital equipment and the thought experiment assumes that the total input of this homogeneous capital equipment is given: for

¹² For those familiar with trigonometry this is obvious. Equations (10.8) indicate that k_a/n_a is the tangent of the angle formed at the horizontal axis by a straight line beginning at point a' and passing through the relevant wage-rate of return coordinates. For example, k_a/n_a at w_a is measured by the tangent of the angle formed on the r axis by the extension of the line a' to a.

example, at level $[k_{a1} + k_{a1}]$. Never-the-less, the measured capital stock varies with the wage and the profit rate!

How is it possible for a capital stock fixed in physical units to vary with the wage and the profit rate? The paradox arises from the need to render the production of the output equal to total value added for the technique as a whole. If one looks back at equations (10.4), one sees that the materials cost of the final output is replaced in the distributional expression by wages and profits generated in the production of the input. However, these wages and profits represent in their origin a certain amount of the input; a certain amount of a commodity other than the final output. In order to add these wages and profits arising from the input to the wages and profits of the final output, both sets of wages and profits must be measured in units of the final output. The denominating of the input in terms of the output was achieved by defining the two commodity system in terms of relative prices, $p = p_2/p_1$.

Now it is clear that 'dividing through' by p_1 was not merely a step to simplify the mathematics of the solution to the factor price frontier, but necessary to aggregate value added for the technique as a whole. A side-effect of obtaining total value added was to measure the capital stock not as $[k_{a1} + k_{a1}]$ but as $p[k_{a1} + k_{a1}] = k$. While $[k_{a1} + k_{a1}]$ is invariant with respect to the wage and the profit rate, k is not. Because the factor intensities of the input and the output are different, p , relative prices, varies with the ratio w/r .¹³ Knowing that the technical coefficients are invariant with regard to distribution is of no help in resolving the paradox of a variable factor intensity in a two product system. With regard to the factor price frontier and choice of the most profitable technique, there is no way to avoid measuring the capital stock as $k = p[k_{a1} + k_{a1}]$.

10.4 Full Employment and Reswitching

The implications of the analysis for short-run employment determination can now be demonstrated. When the capital stock is measured in terms of the relative price of the

¹³ In the Marxian and neo-Ricardian literature, the variation of relative prices with the profit rate is referred to as the transformation process, or transformation problem. See Weeks (1982 chapter III).

output, factor price frontiers will cross more than once (as in Figure 10.4), and the parable about real wages and the level of employment breaks down. To pursue the implications of reswitching, let us return to the neoclassical analysis of the labour market.

The Walrasian process of labour market clearing has a clear logical sequence. If there is excess supply in the labour market, the result is a fall in the money wage. This fall in the money wage results in a fall in the commodity wage, which induces capitalists to switch techniques (the production technique, like everything else are undetermined at the beginning of the market day, to be chosen as a result of the final equilibrium prices). The labour market will be cleared if the lower commodity wage stimulates the choice of a technique which requires more labour for the given capital stock. It is no longer sufficient to say, 'a more labour-intensive technique', because the analysis of the previous section has demonstrated that the very concept of 'factor intensity' is ambiguous except in a one commodity model. Figure 10.4 demonstrates that a fall in the commodity wage may provoke capitalists to choose a technique which employs *less* labour with the given physical capital stock.

The hypothetical adjustment process is clarified by Figure 10.5. Assume there to be three techniques, A, B, and C, as drawn. With the given capital stock fully utilized, technique A generates a demand for labour or level of employment of n_{da} , technique B employment of n_{db} , and technique C employment of n_{dc} , where the letter 'd' indicates that these are the notional demands for labour associated with each fixed-coefficient process, shown in Figure 10.5(a). The factor price frontiers are found in Figure 10.5(b), with one of them drawn as a straight line to keep the diagram as simple as possible. The supply of labour is assumed to be invariant as in previous chapters and to coincide with the demand for labour implied by technique C when the short-run fixed capital stock is fully utilized. In the Walrasian general equilibrium parable, excess supply in the labour market results in a fall in the real wage, which provokes a slide down a smoothly-sloping, monotonic demand for labour schedule.

Now the story is quite different. Assume that the commodity wage is initially above w_0 . The most profitable technique will be A, generating employment of n_0 and leaving part of the labour force unemployed, n_c to n_a . Unemployment will cause the

commodity wage to fall, and when it drops below w_a , capitalists will switch to technique B and employment level n_b following a path such as a_1 to b_1 . However, there is still unemployment, of $n_c - n_b$, so the commodity wage will fall further. When it drops below w_b , 'reswitching' occurs, as technique A reappears as the most profitable. As a result, employment will *fall*, back to level n_a , following a path shown by b_1 to a_2 . Finally, a drop in the commodity wage to below w_c will bring about full employment with technique C. But with many techniques, the theoretical path by which full employment is reached involves a dizzy Yo-Yo-ing from levels of higher to lower employment. Indeed, the auctioneer would have to be on his or her toes to ensure that the capitalists and workers did not become confused in such an erratic process.

The adjustment to full employment equilibrium in a multi-commodity world involves complications considerably more serious than merely erratic jerks between higher and lower levels of employment, as Figure 10.6 demonstrates. Here only the relevant portions of the factor price frontiers of two techniques are shown; i.e., only those portions for which any particular technique is the most profitable. This curve, made up of the most profitable segments of the frontier for each technique, will be referred to as the economy-wide factor price frontier.

In an multi-commodity world, the economy-wide factor price frontier is always downward sloping, but 'wiggly' rather than smooth.¹⁴ Assume that the commodity wage, now a composite of a number of final products, is initially at w_a , generating a level of employment of n_a when the fixed capital stock is fully utilized. At this wage and using technique A, there is an excess demand for labour of amount n_a to n_b . Since one knows that factor' price frontiers cross in this multi-commodity world, assume that some technique B, the full employment technique, is most profitable at both w_{b1} and w_{b2} . This last assumption is not arbitrary, for with reswitching there will always be techniques which appear as the most profitable at wage levels both above and below the prevailing

¹⁴ The mathematics of an economy-wide factor price frontier for a multi-commodity system are complex and tedious. See Fine (1980, 101), where the shape of the curve is briefly discussed, and for a more detailed presentation, Harcourt (1986, 173ff).

wage. Figure 10.6 demonstrates that an adjustment of the commodity wage will indeed bring about full employment, either via a fall or a rise in the wage! A fall in the commodity wage results in full employment via the path a' to d, and a rise in the commodity wage has the same result along the path a' to c. One concludes that in a multi-commodity world, in logic real wage increases are as likely to eliminate unemployment as real wage decreases.

We can now pass judgment upon the neoclassical wage employment parable. There are two reasons why even in theory lower real wages are not the necessary condition to increase employment. First, and argued in the previous chapter, if money is not neutral, then the full employment equilibrium is not unique. Monetary policy alone can change the real wage at which full employment is secured; i.e. perhaps raising it (see Section 8.2). Now there is a second qualification: in a multi-commodity world, the demand for labour is not necessarily downward-sloping for all ranges of the real wage. On the contrary, theory tells us that in general the demand for labour schedule will not be unique and monotonic.

In the introduction to this book a quotation from *The Times* was cited, which ventured the assertion that ‘. . . few economists would argue with the general proposition that lower real wages will mean higher employment. . .’ If it refers to theoretically competent neo-classical economists, this statement is false. Correct would be the statement, ‘no economist would argue with the general proposition that lower real wages will mean higher employment *for a one-commodity world in which money is strictly neutral*’. However, there is a considerable doubt as to whether money is neutral in any actual economy and no debate at all over the obvious fact that all economies are multi-commodity systems. Therefore, startling as it may seem to those inculcated in the neoclassical parable, no general conclusion can be drawn about what might happen to the level of aggregate employment in response to a fall in the real wage.

Faced with this unpalatable theoretical result, some neoclassical economists have shrugged it off with the reply that reswitching of techniques is an ‘empirical’ question. The implication is that until someone demonstrates empirically that the demand for labour is not uniquely monotonic, the real wage-employment parable stands (ferguson 1969). This line of defence gives the game away. That the relationship between the level

of real wages and the level of employment is an empirical question, about which no theoretical generalization can be made, is all that the critics of the neoclassical macro model need to establish. By conceding that the issue is an empirical one, the neoclassical have posthumously accepted Keynes's argument that a falling money wage level is in general an unsound way of achieving full employment in a capitalist economy. In any case, the appeal to empiricism is a defence as empty as it is a surrender, for the wage employment parable cannot be tested in a meaningful way.¹⁵

An economist no less distinguished than Paul Samuelson fervently defended the concept of the aggregate production function, invoking the laws of thermodynamics in its defence (Samuelson 1972, 174). While no doubt considerations of the conservation of energy are relevant to the relationship between inputs and outputs, in an economic system they do not imply that in the aggregate the demand for labour is single-valued and downward-sloping with respect to the real wage in a multi-commodity model, much less in the real world. One can conclude that when referring to actual economic outcomes, there is no theoretical basis for the generalization that lower real wages will stimulate more employment. The opposite conclusion has equal theoretical merit. The

¹⁵ Any econometric test using time series data requires that the aggregate demand for labour schedule be estimated with a production function specified to distinguish between returns to scale and technical change. As is widely recognized, this is not possible without assuming what is to be tested. Were this problem somehow solved, correct identification of the demand for labour schedule requires simultaneous estimation of the demand schedule for capital, though this is hardly ever attempted. This part of the estimation encounters the problem that if factor price frontiers are not linear, then the value of the capital stock varies with the wage and profit rate and cannot be taken as an independent variable. Since the empirical test is for reswitching, it would be invalid to assume linear factor price frontiers, which exclude reswitching. Some writers have sought to test for reswitching in an indirect way, by looking at the factor intensity of commodities traded between two countries. This way of approaching the problem requires one to make a number of rather arbitrary assumptions specific to trade theory. It is interesting to note that some of these studies sustain the hypothesis that reswitching is a significant phenomenon. See Minhas (1962), Leontief (1964), and Ball (1966). The theoretical invalidity of empirical work on production functions is demonstrated elegantly in Shaikh (1974).

neoclassical parable, upon which so many policy prescriptions are based, is a false guide to real economies.

Figure 10.1: The Production function as a range of discrete techniques

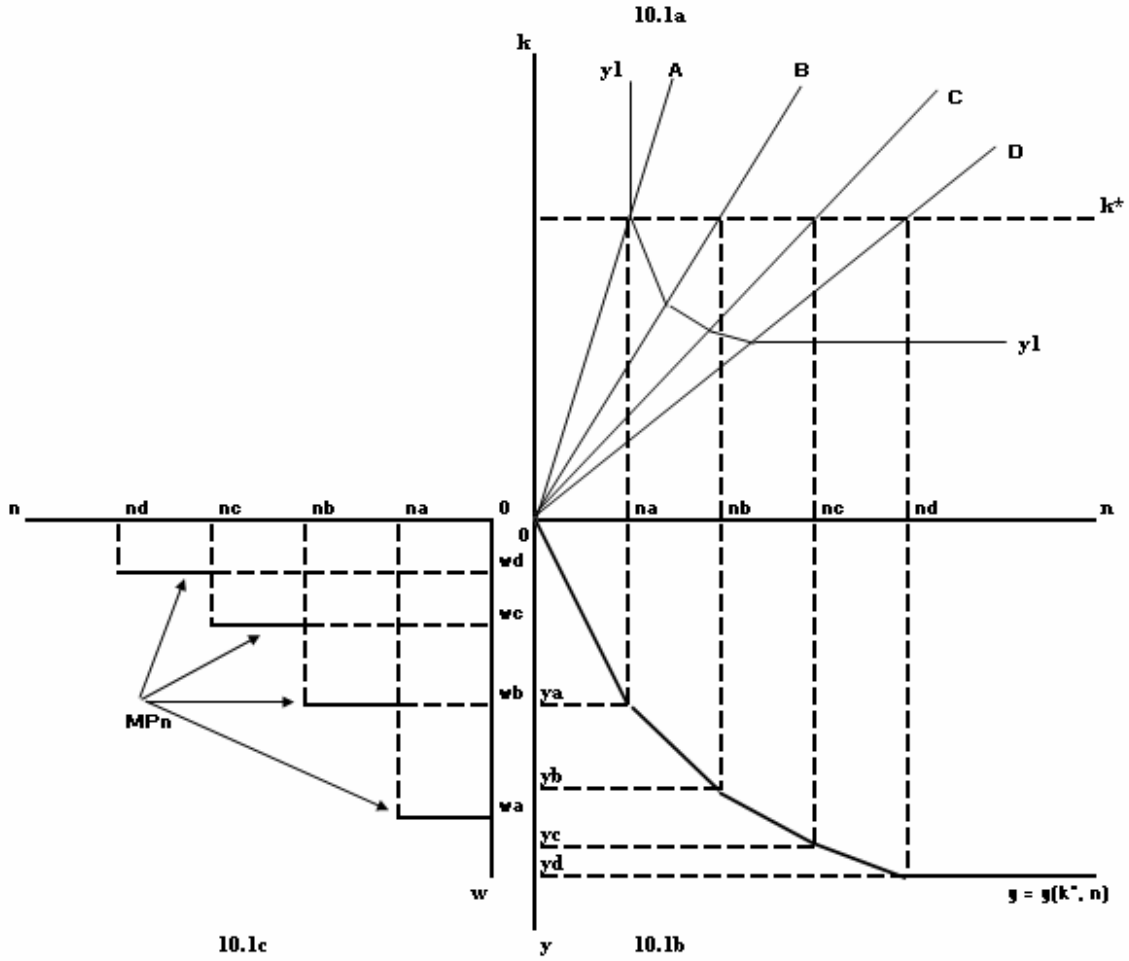


Figure 10.2: Derivation of the factor price frontier for four techniques

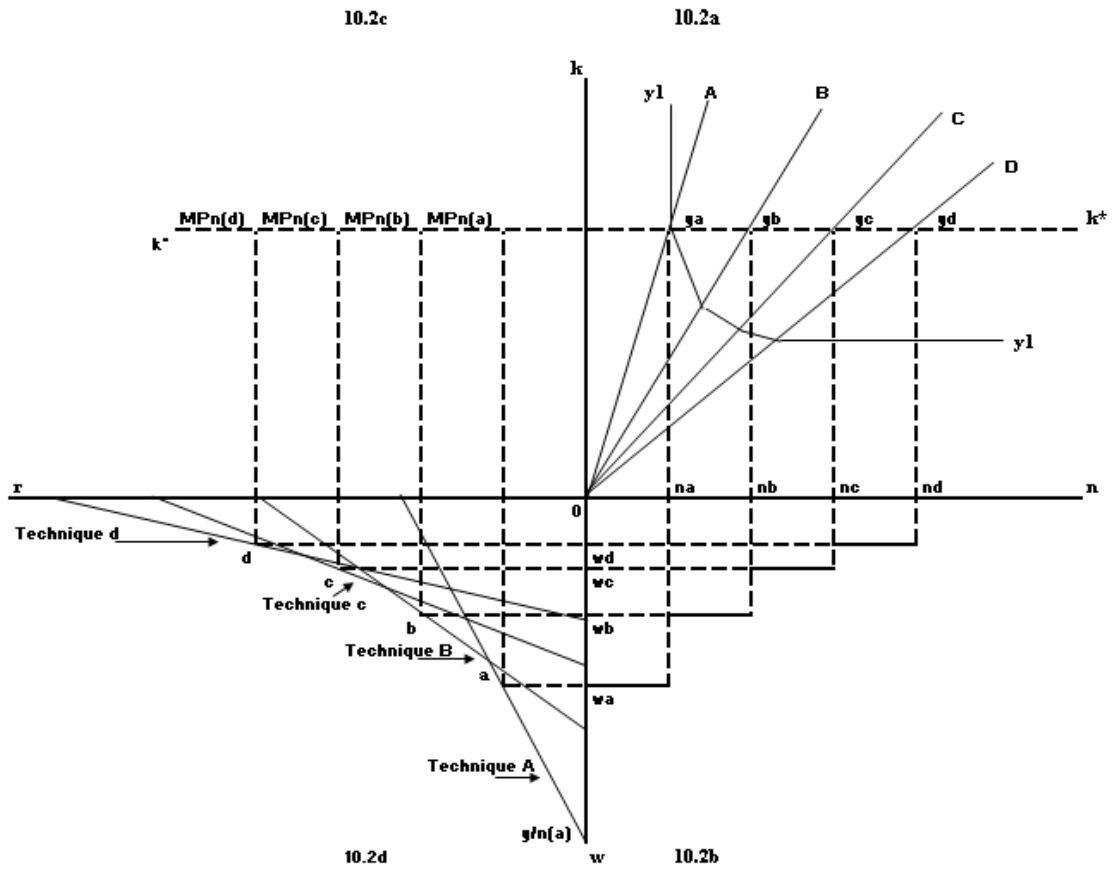


Figure 10.3: Factor Price Frontiers for a two commodity economy

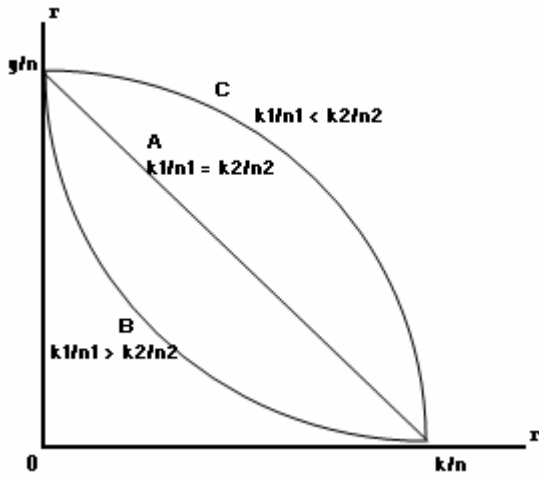
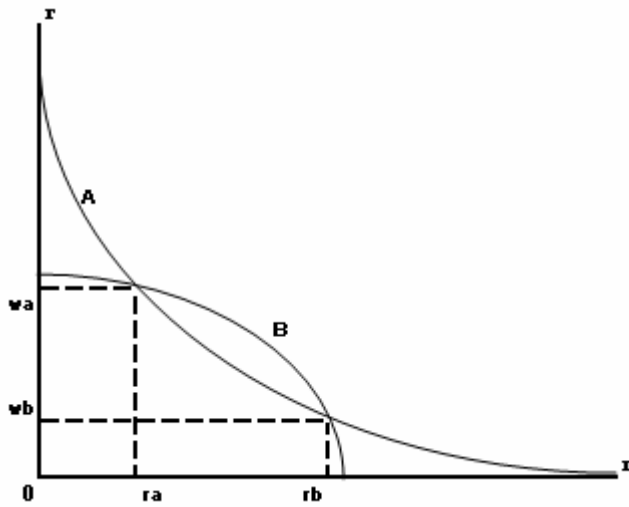


Figure 10.4: A two commodity economy with two available techniques



11 Full Employment and Disequilibrium

11.1 Effective Demand and the Multiplier

As shown in previous chapters, the effect of the synthesis of pre-Keynesian and Keynesian economics was to sanitise the Keynesian part of the logical possibility of involuntary unemployment. This was achieved (1) by the introduction a pre-Keynesian labour market, an aggregate single commodity production function, (2) by rejecting Keynes' view that expectations were inherently volatile, (3) by the inclusion of a wealth effect, and (4) by presupposing general equilibrium with Walrasian market clearing. From its beginning, the synthesis version of macroeconomics left many theorists discontent.

Prominent among these theorists was Clower, who in the 1960s took issue with the manner in which Walrasian general equilibrium theory was used in the neoclassical model. Clower objected to the neoclassical formulation of general equilibrium that limited its application to full employment outcomes.¹ As shown in Chapter 8, when the labour market does not clear due to rigid money wages, Walras' Law appears to breakdown. All other markets can be clear, leaving an excess supply of labour without a compensating excess demand. Clower's critique involved an attempt to reformulate adjustment dynamics along non-Walrasian lines. The key to this argument was the distinction between *notional* and *effective* demand and supply, a distinction we have encountered previously.

Notional demands are those for which the prices of commodities and services are the only variables considered by economic agents. In forming notional demands, agents take prices as given and consider how much they desire to buy or sell at those given prices. They do not consider that they might not be able to buy or sell the desired amounts. Notional demands are unconstrained by demand or income, only by price. The

¹ Clower wrote,

Walras' Law, although valid as usual with reference to *notional* market excess demands, is in general irrelevant to any but full employment situations. Contrary to the findings of traditional theory, excess demand may fail to appear anywhere under conditions of less than full employment. (Clower 1965)

most important aspect of notional demand is the implication that income and, therefore, the amount of labour time offered for sale, is a decision variable.

Effective demand is the expenditure by agents based upon *actual* income.² Effective demand represents what has been called ‘the extra constraint’. In addition to prevailing prices, expenditure must conform to available or current income in the case of a household or to anticipated sales in the case of a firm. The question then arises, under what circumstances will the additional constraint be binding? The answer is quite straightforward: in general, agent's decisions will be income or sales constrained if false trading occurs.

As briefly discussed in Chapter 3, trades at disequilibrium prices produce a result that can be interpreted as the operation of the familiar Keynesian multiplier process. Consider the case in which a firm sells its entire planned supply, but at a price below the Walrasian general equilibrium price. In this hypothetical example the market is cleared in that all output has been sold, but the revenue from the sale is inconsistent with full employment equilibrium. The firm in question will discover that the relationship between revenue and production cost does not justify maintaining the level of employment required produce the planned and sold output, so employment will be adjusted downwards in the next period. A second consequence is that the income paid out by the firm will prove insufficient to make its required contribution to the general equilibrium demands in other markets. In principle one incidence of ‘false trading’ can result in a cumulative movement away from full employment general equilibrium.

11.2 General Disequilibrium

An important implication of the Clower analysis is that unemployment can result even if all wage bargains are struck at the general equilibrium money wage rate. Leijonhufvud demonstrates this striking conclusion with a particularly instructive

² To quote from Clower,

Walras' Law, although valid as usual with reference to *notional* market excess demands, is in general irrelevant to any but full employment situations. Contrary to the findings of traditional theory, excess demand may fail to appear anywhere under conditions of less than full employment. (Clower 1965)

example, which he interprets as Keynes's diagnosis of the fundamental maladjustment that perpetuated the Great Depression. Leijonhufvud reads Keynes as saying that the Great Depression, and depressions in general, resulted from the long-term rate of interest standing at too high a level, implying asset prices too low. With the rate of interest on long-term assets too high, the rate of investment is too low to generate the aggregate demand necessary for full employment equilibrium (Leijonhufvud 1968, Chapter V, and 1981, 56-8).

By this interpretation, false trading occurs in the capital market. The false trading at an interest rate above the general equilibrium rate is explained by Keynes-as-interpreted-by-Leijonhufvud as the result of depressed state of long-run entrepreneurial expectations.³ This emphasis upon a downwardly 'sticky' interest rate produces Leijonhufvud's striking conclusion, and it is worth quoting from him at some length (Leijonhufvud (1968), 335-7).

The essence of Keynes' diagnosis [of depressions] is this: the actual disequilibrium price vector initiating the contraction differs from the appropriate, hypothetical equilibrium vector in one major respect - the general level of long-term asset prices is lower than warranted...Observing unemployment, the 'Classical' economist [e.g. Pigou] draws the conclusion that wages are too high and 'ought' to be reduced. In Keynes' theory, the maintenance of full employment depends upon the maintenance of a 'right' relation between...asset prices and the wage...Keynes' point is that when the appropriate price relation does not obtain, it is in general not wages but asset demand prices that are out of line...

The argument is that unemployment results from disequilibrium in the capital market which manifests itself as excess supply in the labour market, even though the money wage and perhaps the real wage are at their full employment general equilibrium level. In such a circumstance assigning the blame for unemployment to labour and prescribing a fall in money wages to rectify the situation involves a false application of

³ In the later chapters of *The General Theory* one encounters suggestions of a 'secular stagnation' thesis, with Keynes placing stress upon the alleged investment-depressing effects of slow population growth and a slow pace of technical change.

partial equilibrium analysis to a general equilibrium system.⁴ In one of the most insightful comments one is likely to encounter in book on neoclassical macroeconomics, Leijonhufvud (1968, 337) writes,

[Keynes's] diagnosis [of unemployment] is not based on the naive presumption that the causes of disequilibrium are to be found in the markets which at any time exhibit the most drastic symptoms of maladjustment. He approached the problem from a general equilibrium perspective.

Leijonhufvud is here making a point well-recognized in scientific enquiry, namely that things are not always what they appear to be. Even within the context of a neoclassical general equilibrium model, excess demand in the labour market is either a manifestation of general disequilibrium, or the result of some influence which prevents the money wage from adjusting to its general equilibrium level while all other markets are behaving properly along Walrasian rules. To assume that the wage level is the problem is completely arbitrary. In order that all other markets adjust in a Walrasian fashion, it must be assumed that false trading never occurs in any commodity or money market except when forced upon agents by a failure of the money wage to 'properly' adjust. The cause of unemployment can be attributed to an inappropriate money wage only if it is assumed that all other markets function with Walrasian perfection.

There are persuasive theoretical reasons for predicting that false trading would be a general phenomenon characteristic of all markets. In order to clarify this point, the analysis will proceed by considering the neoclassical macro model in its most logically-defensible (if least credible) form. Let it first be assumed that money is strictly neutral, so the general equilibrium solution is not altered by changes in nominal variables; and, second, that there is only one commodity so that the possibility that rising wages will eliminate unemployment is eliminated. With these assumptions made, recall that false trading is banished in general equilibrium theory by the intervention of the Walrasian auctioneer. This treatment ensures simultaneous market clearing, but does so by eliminating time from the analysis, for all exchanges occur at the same instant. Indeed,

⁴ 'The traditional diagnosis of depressions which lays the "blame" of unemployment on the obstinate behaviour of labour is based on a *partial* equilibrium analysis. . .' (Leijonhufvud 1968, p. 337).

general equilibrium theory is the analysis of an economy without the time dimension, as one of the most distinguished neoclassical economists of the theory made clear (Hahn 1984, chapter 4).

False trading is nothing more than trading in the context of chronological time. Once a model seeks to incorporate some concept of chronological time, that all actions are not simultaneous, false trading is implied in all markets. If all exchanges do not occur at the same time, then by definition some precede others. Unless one assumes perfect foresight, in which case simultaneity of exchanges has slipped in under a different name, it is arbitrary as well as not credible to proceed on the faith that a chronological sequence of transactions will produce the general equilibrium vector of prices. This is implicitly conceded in Walrasian general equilibrium theory, by use of the French word *tatonnement* to describe how equilibrium is reached, a word invariably translated to English as ‘groping’. ‘Groping’ in markets in chronological time is false trading. The ‘disequilibrium Keynesians’ required no other defence of the superiority of their analysis over the traditional general equilibrium approach than to point out that chronological time is an inherent characteristic of all economic activity. General equilibrium solutions that exclude false trading are of no practical or policy significance, nor is there any theoretical justification for such an approach.⁵

One would have thought that the obvious limitations of Walrasian general equilibrium theory would have resulted in the ‘disequilibrium Keynesians’ sweeping the field before them and winning a consensus around the view that disequilibrium is the general case and Walrasian market clearing the exceptional one. Indeed, a disequilibrium analysis that incorporates false trading could be seen as a godsend to rescue the neoclassical macro model from its Walrasian vacuousness.⁶ What occurred in the

⁵ Hahn, sometimes a polemical defender of the usefulness of general equilibrium theory in economics, was quite clear in his warnings about the theory's improper use.

The most superficial acquaintance with game theory is enough to convince one that competitive instantaneous market clearing is not an axiom one wants to adopt. . . . What one must. . . not do is to claim that it comes from a deep ‘universal’ of economics or that there are profound philosophical reasons for its employment. (Hahn, 1984, 13).

⁶ Hahn (1984, p. 88) wrote,

profession was quite the contrary. Notwithstanding that trading at non-equilibrium prices is implied by the placement of commodity exchange within chronological time, the burden of proof fell upon the disequilibrium Keynesians to explain why prices should not adjust instantaneously and, therefore, why false trading should occur. This is a strange demand, for it amounts to accepting an imaginary world, full employment general equilibrium, as the norm, and requiring the critics of that imaginary world to verify the existence of the real world.

Stranger still, the disequilibrium Keynesians for the most part accepted this definition of the debate, though Leijonhufvud is an exception (see next section).⁷ Rather than incorporating some concept of time into their analysis, which would automatically imply ‘sticky’ prices, the disequilibrium Keynesians sought to establish their critique within a Walrasian world only slightly modified from the traditional neoclassical one. Specifically, they considered Walrasian markets, ‘without the auctioneer’. This led them to place heavy emphasis on the cost of gathering information. The argument is that in the absence of the auctioneer, the general equilibrium solution can be known only at a cost of information gathering which no rational agent would incur.

While a reasonable enough argument, proceeding on this basis concedes the basic argument to the general equilibrium theorists. As Hahn points out, placing stress upon information costs implicitly accepts the principle that if information were readily and cheaply available, prices and wages would be perfectly flexible and there would be no problem of involuntary unemployment.⁸ Further, invoking lack of information as the

The achievements of economic theory in the last two decades are both impressive and in many ways beautiful. But it cannot be denied that there is something scandalous in the spectacle of so many people refining the analyses of economic states which they give no reason to suppose will ever, or have ever, come about.

⁷ Leijonhufvud (1968, 37) suggested the reform that the ‘strong assumption of instantaneous price adjustment’ be relaxed.

⁸ Again, from Hahn,

A consequence of [the use of general equilibrium theory in macro models] . . . has been. . . to designate all economic states with Keynesian features (e.g. involuntary unemployment) as disequilibria with the further implication that they will, if they exist at all, also soon

cause of unemployment disequilibrium resuscitates the argument that unemployment is ‘voluntary’. It could and has been argued that excess supply disequilibrium in the labour market is the result of workers choosing to wait for a more attractive offer which on the basis of information they suspect might come to them. Precisely to eliminate such an explanation, ‘justification’ is the more accurate word, for why some workers do not have jobs, Keynes excluded ‘search unemployment’ from his definition of ‘involuntary unemployment’ (Keynes 1936, 15). In any case, placing emphasis upon information costs as the cause of unemployment renders the disequilibrium Keynesians particularly vulnerable to attacks from neoclassical economics armed with the rational expectations hypothesis. While the neoclassical mechanism by which agents acquire knowledge does not stand close scrutiny, it does offer a superficially compelling rejoinder to the information-cost disequilibrium analysis.

While one cannot offer a definitive explanation as to why the disequilibrium Keynesians were willing to construct their critique upon such disadvantageous grounds, the proximate cause is clear. Like the general equilibrium theorists, the Disequilibrium Keynesians wish to retain the mathematical and analytical simplicity of market models without time. They abandon a fundamental justification of their approach when they do so. Once one enters a timeless world of the pure imagination, the general equilibrium theorists are quite within their rights to demand an abstract explanation for behaviour which is -an inherent characteristic of the real world.

disappear. Those who have been somewhat more sympathetic to Keynes. . . have none the less quite supinely agreed to having their endeavors called ‘disequilibrium economics’. They have also much to their cost gone along with the vacuous proposition that there could be no Keynesian problems if prices and wages were ‘flexible’ (Hahn, 1984, p. 9)

Hahn's accusation that the Disequilibrium Keynesians accept in principle the existence of a general equilibrium full employment solution finds support in the following passage from Leijonhufvud.

[R]econiling competition with unemployment appears as a ‘riddle’ only when ‘competition’ is implicitly equated with ‘perfect information’. When a more realistic view is taken of the information problem...the emergence of unemployed resources is a predictable consequence of changes in demand. (Leijonhufvud, 1968, p. 102)

Finally, a quite disturbing aspect of the disequilibrium Keynesian approach needs to be mentioned. Particularly in the work of Leijonhufvud, there is a powerful critique of the use of a single-commodity supply side in the neoclassical model. However, the argument that one must consider aggregate adjustment in a multi-commodity context, when combined with a modified Walrasian analysis of markets, results in a *de facto* abandonment of macroeconomics as such.⁹ The disequilibrium Keynesian approach becomes one of considering ‘demand failures’ with reference to specific markets, based upon the behaviour of individuals.¹⁰ Such a treatment has considerably more in common with the economics of the neoclassical economics than with the economics of Keynes. By approaching their analysis along strict neoclassical rules of market clearing (without the auctioneer) in a multi-commodity context, the disequilibrium Keynesians perhaps earn the title ‘neo-Walrasians’. What appeared as so promising and innovative in the early work of Clower and Leijonhufvud was largely swept aside by the rational expectations counter-revolution in macroeconomic theory. This is in no small part because the methodology of the disequilibrium Keynesians discarded the most Keynes’ most important innovation, macroeconomics itself.

11.3 Leijonhufvid on Disequilibrium Adjustment

In terms of its scholarship and the profundity of its critique of the neoclassical macro model, Leijonhufvud's 1968 book, *Keynesian Economics and the Economics of Keynes* was perhaps the most important work on aggregate economic analysis since the end of the Second World War. Partly due to Leijonhufvud’s own emphasis in subsequent work on the lack of full information as the cause of disequilibrium and unemployment,

⁹ Because of the neoclassical method of the disequilibrium Keynesians, their approach would seem to yield the same conclusion as that reached by a distinguished practitioner of general equilibrium theory, ‘Certainly, macroeconomics serves as a good "simple" model which many economists feel is what we need. . . . But how one is to give it a theoretical foundation, I do not know’ (Hahn 1984, p. 193).

¹⁰ Fine and Murfin argue that the disequilibrium Keynesians abandon macroeconomics and therefore should be considered as generalizing general equilibrium theory rather than as critiquing it (Fine and Murfin 1984, chapter 2).

the best insights of the book have been lost. For a time after its publication the book was extremely influential, one of the key elements in what was called the ‘Reappraisal of Keynesian Economics’, but it quickly came under heavy fire from both the orthodox neoclassical and the demand-side Keynesians. As said in the previous section, Leijonhufvud's attempt at reconstruction of aggregate analysis can be faulted on grounds that it abandoned macroeconomics all together. However, the opponents of Leijonhufvud, by focusing on his reformulation of aggregate analysis, largely missed the scientific content of his critique of the neoclassical macro model. The purpose of this section is to resurrect some of his arguments and to indicate their significance.

In previous chapters (2 and 8), we pointed out that unemployment is possible because of a particular institutional organization of production. On the one hand, there are those who own the means by which production is carried out and whose decision to use those means of production is motivated by considerations of profitability: On the other hand, there are those who for all practical purposes have no commodity to sell except their ability to work.¹¹ Unemployment is possible because the majority of ‘agents’ must sell their ability to work to the minority. Without a social division between employers and employees, a division based upon property relations, there is no labour market. With no labour market, there can be no unemployment. Leijonhufvud is one of the few theorists in the neoclassical tradition to recognize this, the social basis of unemployment.

[T]he dynamic properties of an economic system depend upon what I will call its ‘transaction structure’. That labor services are sold for money and that households obtain their consumption goods in exchange for money is one aspect of the transaction structure in Keynes' system. In an economy of self-employed artisans [the problem of] unemployment cannot appear. (Leijonhufvud, 1968, 90)

Leijonhufvud has identified the class nature of production relations in capitalist society, an insight in the tradition of the nineteenth-century classical economists. Though Leijonhufvud employs his concept of the ‘transaction structure’ in a considerably more narrow way than Marx or Ricardo used the ‘social relations of production’ in their analysis, it serves him as a powerful tool for considering the essentially monetary

¹¹ This was Marx's definition of the working class.

character of a capitalist economy. The transaction structure of a capitalist economy implies that all exchanges must be treated as monetary exchanges and that ‘real’ solutions and ‘real’ calculations are largely irrelevant to the theoretical analysis or actual operation of such an economy. Some writers have taken issue with Leijonhufvud at this point, interpreting him as arguing that it is the monetary character of capitalist economies that makes unemployment possible, and countering him with the contention that unemployment is just as much a logical possibility in a multi-product barter model as in a model with money.¹² The argument for unemployment in a barter economy is not difficult to make. In a multi-commodity world without money, individual workers will not in general barter their labour services against the commodity they produce. Rather, the capitalist must pay his workers in units of that commodity, which the workers then would have to barter for food, clothing, etc. In such a model there is no labour market, so unemployment is possible (Chick, 1983, p. 141).

However, it is incorrect to interpret Leijonhufvud as arguing that it is the money character of exchanges which makes unemployment possible. His orthodox neoclassical critics so interpret him because the use of social relations and classes as analytical tools is alien to them. Leijonhufvud's point is considerably more profound than the arid money-exchange/barter dichotomy. His argument is that it is the ‘transactions structure’ (property relations) of an economy which makes unemployment possible, and a secondary consequence of the transaction structure is that the exchange between capital and labour is necessarily a monetary exchange. One can conjure up imaginary examples of barter exchange between capital and labour. The relevance of such models to the problems of a money economy is not obvious (see Section 8.2). It reflects the scientific character of Leijonhufvud’s methods that he wastes no time treating the metaphysics of barter models. Following this line of argument, that capitalist economies must be treated as money economies, Leijonhufvud is particularly scathing in his critique of the neoclassical practice of ‘dividing through by the price level’ to obtain a set of ‘real’ variables. Like Keynes, he views ‘the general price level’ as a vague and imprecise concept (Keynes 1936, 40-43), and that its use as a deflator in theoretical models is a

¹² ‘The idea that there would be no unemployment in a barter economy is grotesque’ (Hahn 1984, p. 192.)

transparent attempt to avoid treating money exchange. The intrinsic role of money in capitalist economies and the complexities created by money calculations are what led Leijonhufvud to conclude that the symptom of imbalance in an economy may not directly indicate the cause of that imbalance.

As explained in the previous section, the particular discordance between symptom and cause which Leijonhufvud stresses is non-clearance of the labour market, explained superficially by the orthodox neoclassical as a result of an inappropriate real wage. Leijonhufvud finds the source of labour disequilibrium elsewhere: the long-run interest rate is too high. This argument of Leijonhufvud's fulfils the promise made in the introduction to his book to interpret Keynes as seeking to integrate the theory of value (relative prices) with the theory of money. As shown in Chapters 1 to 7, no such integration is seriously attempted in the neoclassical macro model, for two reasons. First, the neoclassical approach raises the non-integration of value theory and monetary theory to the level of principle by constructing money-neutral models. Second, consistent use of one commodity models makes a theory of relative prices as unnecessary 'fifth wheel' in the system.

In Leijonhufvud's analytical model there are at least two commodities, one for investment and one for consumption. The interest rate then becomes a true price variable, not just the rate of transformation of present into future consumption. This approach has a strong kinship with the method of the nineteenth-century classical economists. Central to the theories of distribution and growth (accumulation) of Ricardo and Marx was the analysis of the relative values of consumer and producer commodities. However, Leijonhufvud encounters a serious difficulty. While he is interested in treating this problem stressed by the nineteenth-century political economists, he operates with neoclassical tools ill-designed to investigate it. As long as one holds to an analysis based upon the behaviour of individual agents, the analytical power gained from the division of output between consumer and producer commodities cannot be exploited.

A final and extremely important characteristic of Leijonhufvud's book should be pointed out. One of the general conclusions of neoclassical economies, both micro and macro, is that capitalist economies tend to full employment equilibrium automatically under conditions of perfect competition, and, therefore, the only possible causes of

unemployment, fluctuations, and instability are exogenous influences, monopoly power, or state intervention in markets. Heaping ridicule upon such a sanguine view of *laissez-faire* ideology,¹³ Leijonhufvud placed himself in the camp of the handful of twentieth-century economists, such as Veblen, Schumpeter and Keynes, who were bold enough to argue that capitalist economies are inherently dynamic and unstable, not equilibrium systems. It is indeed a shame that Leijonhufvud's insights were lost in a largely trivial debate over information costs and the value of disequilibrium versus equilibrium analysis. If his own writings have contributed to such an interpretation of his work, it none the less remains the case that his 1968 book borders on being a classic of economic analysis.

¹³ On monopoly, he writes, 'We have argued that Keynes' theory constitutes an attack on, not an elaboration of, those explanations of depressions which stress monopolistic restraints on the movement of prices'. Warming to his topic, he goes on to say,

If the wealth distribution which the automatic working of the system brings about is accepted, behavior that interferes with the adjustment of relative prices is dysfunctional to the system and can be condemned on ethical grounds. Academic economists have been the high priests of this ethic. (Leijonhufvud 1968, pp. 107-8)