

2. Definitions and Ideas

Keynes refers to Book II of *The General Theory* as a digression, since it justifies in detail the method of *G.T.* Chapter 3 rather than advancing the argument. Yet it contains ideas of great importance, which modern theory has neglected or distorted, and essential modifications to Marshall's theory of value. *The General Theory* radically alters the theory of the individual firm and industry in order to introduce a properly grounded theory of the output of industry as a whole. The three main concerns of *G.T.* Book II are the definition of appropriate measures of price and quantity for the analysis of industry as a whole (*G.T.* Chapter 4, considered in Section 2.1); the role of expectation in economic theory, which is closely related to the concept of effective demand and the meaning of the short and long periods (*G.T.* Chapter 5, considered in Section 2.2); and the definition of income, and thus of investment and saving (*G.T.* Chapters 6 and 7, considered in Section 2.3).

Keynes considers in great detail in *G.T.* Chapter 4 the meaning of the price and output of industry as a whole, when output and the existing stock of capital-goods are heterogeneous, and the indispensable need to use valid units of measure; a competitive monetary production economy cannot properly be represented by a 'competitive corn model' that assumes homogeneous output (Dutt, 1987). The six pages of *G.T.* Chapter 5, on 'expectation as determining output and employment', are of pivotal importance to Keynes's entire construction, including the formal relationship between the entrepreneurial expectations of the principle of effective demand and the expenditure decisions of consumers and investors in Books III and IV, and the role of dynamics in the convergence of production from short- to long-period equilibrium in a given state of expectation. A careful reading of *G.T.* Chapters 6 and 7 reveals an investment-saving identity but surprisingly *not* an Old Keynesian income-expenditure identity. Throughout Book II flexible relative prices are central to the argument and the Marshallian theory of value is substantially extended, and far from neglected.

2.1 DEFINING PRICE AND QUANTITY

The great virtue of Marshall's equilibrium analysis is its precision. In equilibrium, a firm fixes its level of production at the point where expected price equals expected marginal cost. Price and cost are money-values, and even if Marshall concentrates on relative rather than absolute prices, they remain money prices, and not quantities of other products. Keynes's concern is to maintain this logical precision when the causal analysis is extended from partial to system equilibrium by the definition of aggregate demand and supply functions (D and Z), and in the process he needs to plug a major hole in the Marshallian structure, regarding the treatment of the existing capital equipment.

Keynes's colourful discussion of the use of aggregate measures in historical and statistical analysis recognises the usefulness of an index, which is a scalar transformation (into a single number) of a vector (or set) of heterogeneous objects. He merely points out that vector quantities cannot in general be treated as scalars. This is not an error of which sophisticated Classical theorists are guilty, but it rumbles on in the loose but widespread use of the marginal productivity theory of distribution, and still more in modern growth theory based on the aggregate production function of the Swan-Solow model.¹ The Cambridge capital controversy (Cohen and Harcourt, 2003), to which *G.T.* Chapter 4 is a prelude, is still regarded as a minor curiosity by Classical economists.

Since there is no solution to the conundrums created by trying to treat vectors as scalars, Keynes works in only two units of measure, money-value and labour. The aggregate demand and supply functions are designed to overcome the problem that the price and output of industry as a whole, and especially the current output arising from the activity of the current period, cannot be defined as single numbers; the functions are specified in terms of money-income (which can be so defined, with the help of the concept of user cost, the value of capital-goods consumed in production) and labour.

Demand in a monetary production economy arises in terms of money-value, so that the demand for the output of each industry can properly be added together to arrive at the demand for the output of industry as a whole; but an adjustment is required to the aggregate value, to convert demand expenditure into a measure of aggregate expected money-income, by deducting user cost. Thus Keynes's aggregate demand differs from the Old Keynesian aggregate demand on two accounts, firstly because it is a measure of income, not expenditure, and secondly because it is income expected by entrepreneurs, not expenditure planned by consumers and investors.

There is no Marshallian equivalent of the aggregate demand function, but the ‘aggregate supply function’ can be defined equally well for a firm, an individual industry, or industry as a whole. The aggregate supply price Z_r differs from the Marshallian unit supply price p , because Z_r is a measure of expected income or ‘proceeds’, net of user cost. The proceeds are the total income of the entrepreneur and the factors of production taken together, which is maximised when marginal proceeds equals marginal factor cost. The aggregate supply function also differs from Marshall’s supply function in relating a measure of expected income, not to output, but to employment, which is a close proxy for output and can realistically be treated as homogeneous in the short term where output cannot. ► **A2.1.1** The importance of the aggregate supply function is that it can properly be defined for industry as a whole as the sum of its parts: the expected income of each firm being a money-value, which can be added to those of other firms to give aggregate expected income, and the employment of each firm being added together to give aggregate employment. ► **A2.1.2**

Keynes’s concepts of aggregate demand and supply complement and do not replace Marshall’s analysis of industry demand, and supply by individual firms. Keynes’s entrepreneurs still set their individual output and employment in Marshallian fashion, in accordance with their expectation of the price in their own industry. The aggregate supply function for a single industry or firm, $Z_r = \phi_r(N_r)$, stands in a formal relation to the ordinary Marshallian supply curve based on a measure of physical output (*G.T.* 44). In this case, a short-period production function $O_r = \psi_r(N_r)$ can be used to express the ordinary supply curve in terms of the aggregate supply function $\phi_r(N_r)$. Since the aggregate supply price Z is the required proceeds, net of user cost, the supply price of homogeneous output equals the value of proceeds plus user cost per unit of output,

$$p = \frac{\phi_r(N_r) + U_r(N_r)}{\psi_r(N_r)}$$

Note that this is not a marginal condition but a transformation mapping Z_r onto p .

The link between the ordinary Marshallian supply curve and Keynes’s aggregate supply function, as expressed clearly in this equation, is the much neglected concept of user cost. This is the value of capital-goods that firms physically *consume in production*, although Keynes employs the term ‘use’ rather than ‘consume’ when referring to firms and production, in order to

reserve ‘consumption’ for the demand function. User cost is a measure of value and not a physical quantity and, since it relates to the decision to produce, it is voluntary, in contrast with the expected and unexpected involuntary depreciation of capital-goods defined respectively as supplementary cost and windfall losses. User cost is the opportunity cost of using up a capital-good in production, rather than holding it purely as an investment asset. ► **A2.1.3** User cost, the value of capital-goods consumed as a result of the physical act of production, is the direct opposite of investment, the value of capital-goods physically produced, and the manner in which user cost enters into the employment decision bears a close relation to the investment decision, since both involve the consideration of the prospective yield of an asset. At the aggregate level, user cost excludes the sale of assets, just as investment excludes the purchase of existing assets. The neglect of user cost has led to the view that income can be defined equally well either as the value of current output (*G.T.* 63), or as the value of expenditure, with serious consequences to be discussed later in this chapter.

The neglect of user cost in Marshallian theory involves the tacit assumption that marginal user cost is zero, or that the deterioration of the capital-goods is made good by immediate replacement. Implicit in this is that metaphysical entity, Capital, which commercial practice requires to be maintained, and which Classical theory treats as possessing an homogeneous existence independent of its embodiment in real assets.² Keynes points out that no-one would regard the user cost of a ton of copper as zero, and there is no difference of economic principle between raw materials and machinery which wears out with use. It is therefore of vital importance to develop the theory of value to take account of the consumption of the existing stock of capital-goods. User cost is also necessary to link the microeconomic theory of supply price to a macroeconomic theory of aggregate supply which is independent of the structure of industry and the degree of integration of production. Without such a link, Marshallian theory becomes lost in ‘the whole pack of perplexities which attend the definition of income’ (*G.T.* 67).

The concept of user cost allows Keynes not only to complete the Marshallian theory of supply price, but to provide the foundation for an unambiguous definition of income. Attempts to define income without a clear conception of user cost founder on the problem of identifying how much of a firm’s sales in any given period (*A*) represents newly produced output and how much is in some sense the value of output brought forward from previous periods; in other words, how to define *current* output. Indeed this corresponds directly to the opposite problem, of the status of output which is not sold, but carried forward to the next period. Fisher (1930) goes so far as

to exclude investment from the definition of income, so that investment is merely a cost of production of future income (= consumption), and Keynes's separate controversies with Hawtrey and Robertson are referred to in *The General Theory* itself.

Both total and marginal user cost play key roles in Keynes's argument. In daily equilibrium, firms set production and employment at the level where the expected unit price of finished output, for delivery at the end of the production period, equals the expected marginal prime cost, defined as the sum of marginal factor cost and marginal user cost over the production period. User cost involves long-term as well as short-term expectation if the life of the capital-goods extends beyond the period of production. User cost is therefore an aspect of the discussion of the valuation of capital-goods which plays so great a role in *G.T.* Book IV. It is a crucial part of Keynes's integration of macroeconomic and microeconomic analysis, and an important element of the incorporation of expectation into both the principle of effective demand and the theory of the supply price of an individual firm.

User cost, then, is the inverse of investment. The decision to consume a capital-good in production involves the same considerations as the decision to produce a new one, and as the decision of the form in which to store value and relates, as we shall see in Chapter 4 of this book, to the discussion of the nature of money in *G.T.* Chapter 17. There is a remarkable unity in Keynes's conception of the relationship between time and capital-goods; he refers to capital-goods, in the context of all three types of decision, as the bridge between the present and the future.

2.2 EXPECTATION AS DETERMINING OUTPUT AND EMPLOYMENT

The brevity of *G.T.* Chapter 5 has proven to be a major obstacle to the understanding of *The General Theory*, and the source of much confusion. The Chapter contains the elements of Keynes's treatment of time, upon which depends the rest of the theoretical structure, including his concepts of equilibrium, the state of expectation, effective demand and income. This chapter is therefore rather important. The interpretative confusion runs very deep and centres on the 'Swedish' (*ex ante*, *ex post*) concept of equilibrium income in the sense of the fourth criterion of the Prologue of this book, the fulfilment of expectations, as opposed to the idea that income at any time is an equilibrium value in the mechanical sense here ascribed to Keynes. The

importance of this difference between Keynes and the ‘Swedes’ (here including Hicks) will become clear in this and the next section.

In the standard text-book exposition, the point of effective demand is the intersection of the Keynesian cross, the level of aggregate output where entrepreneurial expectations of income (*ex ante*) are fulfilled (*ex post*). On this understanding of the point of effective demand, as a position of equilibrium in the sense of our fourth criterion, there is no difference at the point of equilibrium between income (both expected and realised) and effective demand. Since price changes are abstracted from, effective demand and aggregate demand (in the expenditure sense) are also equivalent in equilibrium. These Old Keynesian propositions are captured by an equilibrium condition

$$Y^* \equiv D^* = D \quad (2.1)$$

where Y^* means equilibrium income (in the sense of the fourth criterion, the fulfilment of expectations), D^* effective demand, and D aggregate demand.

In the Post Keynesian tradition, the point of effective demand D^* and the aggregate demand function D are more clearly distinguished from each other and Keynes’s aggregate supply function (Z) is explicitly restored. The effective demand D^* is now given by the intersection of the Z and D curves and once again, in equilibrium, income corresponds to effective demand. So we can now write the equilibrium condition as:

$$Y^* \equiv D^* = D = Z \quad (2.2)$$

The Post Keynesian treatment identifies that at the point of effective demand individual firms are maximising expected profits, since Z is a transformation of the set of Marshallian supply prices on which aggregate output is based. In both Old Keynesian and Post Keynesian treatments, it is possible for entrepreneurial expectations of income to depart from their equilibrium values, so that realised income does not equal expected income, and $Y \neq Y^*$. In a dynamic process involving the multiplier, firms adjust output and employment over time so that expected income converges on its equilibrium value $Y^* \equiv D^*$. It is important to note that in these treatments the levels of expected income and of employment at any time can be *disequilibrium* values.

Chapter 1 of this book has argued, by contrast, that Keynes treats the system as at all times in equilibrium at the point of effective demand. I must emphasise once again that this means equilibrium in the mechanical sense

(based on the first two criteria), not in the sense of the fourth criterion (the fulfilment of expectations) that underpins the concept of equilibrium income employed by received Old Keynesian and Post Keynesian economics, let alone the third criterion of Walrasian general equilibrium. As a corollary, I am arguing that the level of employment (but not the labour market) is for theoretical purposes treated by Keynes as at all times in equilibrium in the mechanical sense. The level of employment is determined by the state of expectation through effective demand, and strictly, it is not relevant to employment whether expectations are fulfilled. The level of aggregate income Y , whether realised or expected to arise on any given day, bears no simple relation to the aggregate effective demand on that or any earlier day, and the equilibrium level of income Y^* (defined on the fourth criterion) is conceptually quite different from the point of effective demand D^* , and indeed in my view plays no role in *The General Theory*. In the earlier shorthand this may be written as the proposition

$$Y \neq Y^* \neq D^* = D = Z \quad (2.3)$$

This means that while it is conceivable, if unlikely, that the income realised from the sale of finished output could equal the expected value that originally prompted its production, such coincidence does not define the equilibrium level of employment. Employment is *always* in equilibrium (in our mechanical sense) corresponding to D^* , and in general the value of D^* need correspond neither to realised income Y nor to a level of income Y^* corresponding in some sense to the fulfilment of expectations. Indeed, the received (fourth criterion) concept of equilibrium income Y^* does not in fact stand up to intense scrutiny. It implies that a comparison is possible between aggregate expected and actual income on a given day leading to a stabilising feedback process. However, actual income reflects decisions to produce finished output at a variety of different dates in the past, as well as windfall profits on work-in-progress at many different stages of completion. Similarly, the expectation of income due to arise on any given day may have been subject to as many revisions as there are days in the production period. Furthermore, even in the absence of changes in the state of expectation, the sale price of today's finished output relates not to effective demand on any single day, but to a series of past values of expected income over the production period. Income and effective demand have, in general, different dimensions in time (see Figure 1.2 on page 58). The concept of equilibrium income can be made meaningful, if output is assumed to be homogeneous

and if the day is defined as the production period, but this is clearly not Keynes's method.

The state of short-term expectation that governs decisions to produce consumption- and capital-goods can be represented numerically by the set of equilibrium expected prices or 'rational expectations' corresponding to effective demand. If, as I have argued, Keynes's equilibrium short period is equal to his calendar day, and the day is the quantum unit of time, the state of expectation and its corresponding level of effective demand defines an equilibrium level of employment at any time. Provided that entrepreneurs maximise expected profits, the daily level of employment will always be in short-period equilibrium in the mechanical sense. The state of expectation and effective demand may change from day to day, and the level of employment may change with them but will remain in short-period equilibrium. Nevertheless, a further aspect of production time must be taken into account, that the aggregate capital equipment cannot be adjusted (through the production of new goods or the using up of old goods in production) as quickly as the state of expectation and employment may change. It is necessary to introduce a long period, in the technical sense of the time required to adjust the aggregate stock of capital-goods, as well as aggregate employment, to a new state of expectation.

Keynes denotes as the 'long-period employment' the equilibrium level and distribution of employment corresponding to a given state of expectation once the disequilibrium fluctuations, arising from the change that led to the current state of expectation, have fully worked themselves out (*G.T.* 48). ► **A2.2.1** The source of the disequilibrium fluctuations described by Keynes is emphatically not expectational error but production time, which introduces lags into the dynamic process of convergence of employment on its long-period position (*G.T.* 47–51, 122–4, 287–8). Although the state of expectation will most likely change before employment has reached its long-period position (*G.T.* 50), on any given day employment will be both in short-period equilibrium and on a traverse or convergence path towards the long-period position. ► **A2.2.2**

Thus the title of *G.T.* Chapter 5 should be taken literally, that the state of expectation determines output and employment. On this reading, it is not relevant to today's decision whether today's state of expectation is correct; if tomorrow's market prices lead to a change in the state of expectation, employment will change accordingly, yet tomorrow's state of expectation is strictly independent of today's and of the day after tomorrow's. Furthermore, although expectational error is one cause for revision in the state of expectation, it is neither the only one, nor necessarily the most important. The

state of short-term expectation that determines effective demand depends partly on the state of long-term expectation, itself a function of the state of confidence, on the state of liquidity-preference, and on the propensity to consume. All three of these major psychological independent variables are capable of unpredictable shifts, leading to the disappointment of previous expectations.

In a key passage Keynes writes:

Express reference to current long-term expectations can seldom be avoided. But it will often be safe to omit express reference to *short-term* expectation, in view of the fact that in practice the process of revision of short-term expectation is a gradual and continuous one, carried on largely in the light of realised results; so that expected and realised results run into and overlap one another in their influence. For, although output and employment are determined by the producer's short-term expectations and not by past results, the most recent results usually play a predominant part in determining what these expectations are. (*G.T.* 50–51)

These statements have usually been read, in line with a definition of employment equilibrium as a point where expectations are fulfilled, as evidence of an assumption in *G.T.* Chapter 3 that short-term expectations are so fulfilled. The present argument takes the passage more literally as meaning, not that current expectations correctly anticipate future results, but that past results heavily influence current expectations; so that if change is at a gradual pace, relative to the shortness of the day, expectations often will be fulfilled, or 'overlap' with realised results. This passage is part of Keynes's concern throughout *The General Theory* to reflect the empirical stability of the price system, and remains consistent with his statement that 'employment is determined *solely* by effective demand' (*C.W.* XIV, p. 180).

This passage also gives explicit notice of Keynes's switch in focus, in discussing aggregate demand, from entrepreneurial expectations in *G.T.* Book II to the expenditure decisions of *G.T.* Books III and IV. This point is of great importance and requires emphasis. The change also corresponds to a switch to discussing income rather than effective demand, which returns to prominence only from *G.T.* Chapter 18 onwards. The coupling between expectations and expenditure, between effective demand and income, cannot be made formally exact; by the time final output is delivered, the state of expectation will almost certainly have changed as a result of changing views about the long-term future. Nevertheless it is realistic to link today's aggregate demand (i.e. dealers' expectations) with today's expenditure (as opposed to employment), because today's consumption depends mainly on the income of the factors of production, which is fixed when they are

employed and equals the effective demand for their services (ibid.); while the consumption of entrepreneurs (especially corporations and their shareholders) out of profits is likely to be insensitive to minor differences between expected and realised income. The theoretical link of *G.T.* Chapter 3 between employment (as opposed to income) and aggregate demand is thereby preserved.³

Like *G.T.* Chapter 3, this discussion of expectation and effective demand has made no mention of the multiplier, which plays such an important role in the Old Keynesian interpretation. The multiplier quite rightly turns up only in *G.T.* Chapter 10, as a market-period equilibrium relationship between the realised values of consumption and current investment output, a determinant of the level of income, which may thereby affect the state of expectation, but is not itself a causal element of the principle of effective demand. Indeed, as we shall see in the next section, it is realised income Y (without the asterisk) which is to be understood as an equilibrium value in itself, without any reference to the concept of expected income. Income and the equilibrium spot prices of current output are determined by expenditure, in which the multiplier relationship plays a role; effective demand and the equilibrium forward prices on which employment is based are determined by expectation, where we have analytically separated the expectations of employers and dealers in order to show how expected forward prices can be regarded as equilibrium prices. These two matters, expenditure and expectation, are conceptually quite different: the link through factor income to the revision of expectations in the light of realised results is a loose coupling, which allows for the revision of expectation for many reasons other than expectational error. Equilibrium of any sort is possible only in a given state of expectation, and Keynes's method both permits the use of equilibrium analysis and allows for a continually shifting state of expectation. ► **A2.2.3**

2.3 THE INVESTMENT-SAVING IDENTITY

Keynes's definition of user cost unlocks the 'perplexities which attend' (*G.T.* 67) the definitions of aggregate income, investment and saving as well as completing the Marshallian theory of supply price. It is most ironic, given the importance and amount of attention Keynes gives to the definition of income, that Hansen should state 'The section on Income is of no great importance for an understanding of *The General Theory* and may quite well be omitted if the student so wishes' (1953, p. 54). On the contrary, it is of paramount importance to recognise that Keynes defines *income* as the market

value of output and not the value of expenditure, which explains the attention Keynes gives to *user cost*, the value of the capital-goods consumed by firms in the production of output. Keynes approaches income from the supply as well as the demand side, in terms of production, a perspective thoroughly obscured by the income-expenditure model. As Colander (2001) reminds us, following Chick (1983), Keynes could just as well have called *G.T.* Chapter 3 'the principle of effective *supply*'.

In order to appreciate Keynes's definition of income, it may be wise to use *investment* (unqualified) solely to refer to the production of new capital-goods, where a 'capital-good' means any good held by a firm (even if it is held for sale to a consumer, e.g. stocks of finished consumption-goods). What Keynes initially defines as *current investment* (*G.T.* 62), but then immediately for convenience calls simply 'investment', is the value of newly produced capital-goods less user cost, the value of capital-goods used up in production. *Net investment* means the increase in the value of the stock of capital-goods after further deducting supplementary cost, the expected depreciation of capital-goods independent of their use in production. Although the value of *investment* (or gross capital formation) can be aggregated easily since each new capital-good can be identified, both *current* and *net investment* require consolidation, since at the individual level they include purchases of capital-goods (both new and old) less disposals of value whether by sale, use in production or depreciation. Throughout the discussion income and current investment are always money-values, and consumption is defined *ipso facto* as sales other than to entrepreneurs (*G.T.* 62). Keynes deliberately side-steps the problems of defining real income and of consumer durables: when he does refer to *real* income ('in some sense', *G.T.* 91) he means money-income deflated by the wage-unit, not Pigou's concept of the national dividend: he deals in money-income and not the utilities yielded by consumption-goods, because the level of employment in a monetary economy is in the first instance the result of entrepreneurs maximising their money-income and not directly of households choosing a preferred allocation of their productive resources.

Using Keynes's symbols to denote aggregate values, A represents total sales by firms and A_1 total sales between firms, so that the aggregate value of sales to consumers (C) is $A - A_1$. Aggregate current investment (I) is sales between firms less user cost, $A_1 - U$. Entrepreneurial income or profit (P) is total sales less total prime cost, $P = A - F - U$, where factor cost is F ; aggregate income (Y) is the total income of factors and entrepreneurs $Y = F + P = A - U$. Therefore income equals consumption plus current investment $Y = C + I = A - A_1 + A_1 - U$. If saving (Keynes uses no symbol,

perhaps pointedly, but call it S) is defined as equal to income less consumption, we have $S \equiv A - U - (A - A_1) = A_1 - U = I$. Net income, net investment and net saving present no subtle problem of definition, being arrived at in each case simply by the further deduction of supplementary cost V . Income is the concept relevant to production, and net income the one relevant to consumption.

Aggregate current investment and saving are identically equal, as a matter of double-entry book-keeping: saving is simply the accounting record of investment.⁴ Keynes's 'investment-saving identity' is *not* the Old Keynesian 'income-expenditure identity', since current investment reflects both expenditure A_1 and user cost U , which involves no expenditure. There is only an income-expenditure identity on one of two conditions. Either user cost must be excluded by incorrectly including it with supplementary cost and treating the depreciation of capital-goods as relevant only to net income; or alternatively, user cost must be treated as (negative) expenditure even though it involves no sale. There is always of course a sales-expenditure identity $Y + U = A \equiv (A - A_1) + A_1 = C + I + U$. This may seem a fine semantic point – I am not suggesting the national accounts do not balance – but it draws out the difference between the definitions of income by Keynes and by the 'Keynesians': the latter define income as consolidated aggregate sales (treating the consumption of stocks as a sale or negative purchase, but neglecting the user cost of fixed capital equipment) or Gross Domestic Product. ► **A2.3.2**

The whole of *G.T.* Chapter 7 addresses the attempts of various authors (including Keynes himself in *A Treatise on Money*, Vol. 1, C.W. V) to escape the remorseless book-keeper's logic of the investment-saving identity. The most important problem has proven to be the perception of a relationship between saving and changes in the quantity of money and debts, represented by loanable funds theory, which seeks to maintain the Classical linkage between the rate of interest and the rate of saving. The refusal of this controversy to die reflects its importance to neo-classical theory (in Keynes's strict sense, *G.T.* 177), as the version of Say's Law required if money is to be neutral in the long term. Robertson's version (Hicks has another) holds that saving is a form of cash flow (i.e. income realised in cash but not spent), and since investment at some point requires finance in cash, it seems reasonable to regard saving as part of the problem of finance. The rate of interest then clears the market for the demand and supply of finance, the demand for finance being driven by expected investment returns, the supply of finance being determined mainly by decisions to prefer future to present consumption, in the absence of monetary disturbances.⁵

The problem with Robertson's version of loanable funds theory can be understood in terms of accounting concepts, as the confusion between income and cash flow, and between the two sides of a balance sheet; between a reserve in the sense of a liability, such as a profit and loss account, and a reserve in the sense of an asset, usually a money balance. A cash flow statement reconciles the gross changes between two balance sheets (being statements of assets and liabilities at two different points in time), in terms of the acquisition and disposal of assets and liabilities on both income and capital account. An income or profit and loss statement over a period of time bears no simple relation to the balance sheets at each end of the period.

► **A2.3.3**

Aggregate saving is never independent of aggregate current investment, while saving and money (Keynes's 'cash' or 'finance') always appear on opposite sides of a balance sheet (a bank deposit is money only for the creditor, not for the issuing bank). Like chalk and cheese, saving and money look very similar, but cannot legitimately be inter-changed or combined, as implied by the loanable funds equation $S + \Delta M = I + \Delta H$; saving, despite common usage, is not a 'loanable fund' at all. To demonstrate this more clearly requires further consideration of the nature of income.

A sale occurs when an agreement to exchange one good (including a service, by a firm or a factor of production) for another, usually a sum of money, is fulfilled at the agreed price. If the good sold already exists, this is an agreement for sale on capital account and does not create income. If the good sold is to be newly produced, this agreement is directly or indirectly an order for factor services, and a prelude to income. Income itself arises (is 'recognised' in accounting terminology) when the newly produced good or service is *delivered*. Whether on income or capital account, the sale is recorded as taking place on delivery.

The economic value of a good is what it can be sold for, and is independent of whether or not a sale actually takes place. For the purposes of causal analysis of production and employment decisions, income must be treated as arising on the production of a new good (delivery within the firm from one workshop to another, if you like; but delivery is not *per se* a sale, as required if user cost is to be treated in terms of expenditure); although accounting standards recognise income only when the new good is delivered to a third party under a sale agreement. For economic purposes, on the assumption of perfect competition, income arises at current market prices when a good is newly produced, as a matter of temporary market-period equilibrium, whether it is taken into the firm's own stock (negative user cost, or investment) or delivered to a customer (a sale). A sale creates a debt, an

obligation of the buyer to pay the sum of money specified in the sale agreement, which the buyer must settle on delivery or at some agreed future date after a period of trade credit. The sale has been made, whether or not the debt has been settled. Indeed if the buyer defaults on the debt, the accountants treat this as a 'bad debt' rather than a cancellation of the sale which created the debt.

Corresponding to the debt from the customer or the newly produced asset held in stock, on one side of the balance sheet, there has to be a balancing increase in liability on the other side of the balance sheet, where liability includes net worth: this increase in liability is saving. In the case of factors, there is no difference of principle: I may receive my salary monthly, but I earn income every day that I go to work (as I soon learn if I leave a job half-way through the month, and find my final pay cheque reduced from the previous monthly amount). Every day that I turn up for work creates a debt from my employer, which is settled every month. At the same time I am incurring expense, perhaps on credit (such as utility bills), and my saving in any period presents the difference between income earned and expense accrued – irrespective of whether it is pay-day or whether I pay my bills. Conversely, many a small business goes broke with expanding sales and a full order-book, not for a lack of retained profit (saving) but because of a lack of cash. You cannot meet a payroll from the profit and loss account.⁶

Aggregate income is the value of newly produced goods delivered by firms (A), less the value of capital-goods lost through use in production (U). Saving is the value of newly produced goods delivered by firms (A), less the value of goods lost through use in production (U) and delivered to consumers (C). Aggregate current investment is the value of newly produced goods delivered to firms ($A - C$), including their own 'internal deliveries', less the value of goods lost through use in production (U), and amounts to the same as saving ($A - C - U$). Cash flows arise only on settlement of any debts created by these deliveries, and are in logic an entirely separate matter. The necessary equality between aggregate saving and current investment stems from the physical acts of delivery and use of capital-goods, and there is no means by which a change in the terms on which cash is available to pay debts can alter the balance between saving and investment. Of course, a change in the price of finance may alter decisions to enter as a buyer into particular agreements for sale, or the decisions of firms to carry out production at a certain level. *G.T.* Books III and IV address in detail the influence of the rate of interest on the propensity to consume and the inducement for an investor to commit to the production of a new capital-good. This does not alter the fact that there is quite simply no direct connection between aggregate

expenditure, cash flow and income. All three have quite distinct and separate meanings.

As Keynes puts it, far more succinctly,

[N]o-one can save without acquiring an asset, whether it be cash or a debt or capital-goods; and no one can acquire an asset which he did not previously possess, unless *either* an asset of equal value is newly produced *or* someone else parts with an asset of that value which he previously had. In the first alternative there is a corresponding new investment: in the second alternative someone else must be dis-saving an equal sum. For his loss of wealth must be due to his consumption exceeding his income ... (*G.T.* 81–2)

The significance of the aggregate investment-saving value identity is far-reaching. In *G.T.* Chapter 2 Keynes identified, as central to the Neutral economy of the Classical theory of employment, the idea that the interest rate is a price which keeps aggregate saving from income in equilibrium with the aggregate current investment of income. In *G.T.* Chapter 6 by careful definition of terms he has identified that saving has no independent existence and is always purely a reflection of current investment. Saving and current investment are kept in equilibrium by movements, not of the rate of interest, but in the level of income. If the markets for consumption-goods and capital-goods in each industry are in competitive equilibrium, there is no sense in which saving and current investment can be equal but not in equilibrium: the existence of a market value for output is a sufficient condition for equilibrium at any time (*G.T.* 64).

Hicks developed a more subtle form of the loanable funds doctrine using the Swedish concepts of *ex ante* and *ex post*, based on a Walrasian concept of equilibrium over time, with clearing factor markets and a constant state of expectation. Our previous discussion has already indicated why this is not an appropriate foundation for a theory of the monetary production economy.

► A2.3.4

2.4 SUMMARY

Book II of *The General Theory* addresses fundamental issues which modern theorists have continued to debate, apparently without realising that Keynes has already resolved them. Most seriously, the Classical microeconomic foundations of macroeconomics are already there in *The General Theory* itself.

Macroeconomic theory is not valid without recognition of the heterogeneous nature of output, prices and capital-goods. Keynes devises a technique for causal macroeconomic analysis in terms of money-value and labour alone, since this is all that entrepreneurs need in practice to make employment and investment decisions. This allows him to propose a determinate theory of aggregate employment without compromising, and indeed by enhancing, the theory of the supply price of the individual profit-maximising firm.

Far from neglecting the theory of value, Keynes extends Marshall's analysis from partial to system equilibrium, in part through introducing the concepts of user cost and the aggregate supply function. User cost is the inverse of investment, and an integral part of Keynes's conception of durable assets as a bridge between the present and the future. Consumption by firms is integrated into both microeconomic and macroeconomic analysis alongside investment and personal consumption, thus rectifying a major omission from the theory of value. The aggregate supply function is shown to be a more general form of the Marshallian supply curve by dispensing with the requirement to specify output in physical terms, and it provides an analytical tool which can be used equally at the level of the firm, the industry or the economy as a whole.

The rigorous definition of income and current investment as the market value of output, not expenditure, is the foundation stone both of the principle of effective demand and of the refutation of the Loanable Funds version of Say's Law. The aggregate investment-saving identity is a matter of book-keeping logic that leaves no room or need for the rate of interest to clear a market for saving and investment. Saving is a residual in the aggregate income account, and has absolutely nothing to do with finance, which is a matter of balance sheets.

Behind the whole discussion is the recognition that production by any process that takes time must be based on expectations of future prices and so on expected income. The employment decision, the primary concern of *The General Theory*, depends on the short-term expected prices of consumption- and capital-goods. Disappointment of past expectations does not affect output and employment except insofar as it affects current expectations, and is of secondary importance. The state of expectation and effective demand may change from day to day for reasons other than disappointment, and the level of employment may change with them, but will remain in short-period equilibrium. Nevertheless, a further aspect of production time must be taken into account, that the capital equipment cannot be adjusted as quickly as the state of expectation and employment may change. This leads, on the

hypothesis of a constant state of expectation over the period of production, to a dynamic process of convergence of employment to a long-period equilibrium position.

Keynes stated that he wrote *G.T.* Book II ‘to clear up certain perplexities which have no peculiar or exclusive relevance to the problems which it is our special purpose to examine ... so that I could not express myself conveniently until I had found some solutions for them’ (*G.T.* 37). The underpinning of current macroeconomic theory is a simplified dynamic inter-temporal general equilibrium model based on the Swan-Solow model, with a constant state of expectation, homogeneous output and capital, and saving brought into equilibrium with current investment by the rate of interest. The importance of the subtle problems raised by Keynes in these chapters, and of the solutions offered by him, has simply not been recognised.

NOTES

1. See Mankiw (2003), Chapter 3 and the whole of Part III. A recent restatement of the econometric case against the use of ‘empirical’ aggregate production functions is set out in McCombie (2001a, 2001b). Contra Mankiw (2003, p. 73), the evidence of stable income shares does not provide empirical support for the Cobb-Douglas production function.
2. Pigou uses the analogy of a lake, into which flow streams of new capital-goods, which flow out again as consumption in one form or another (1932, pp. 43–9). Other metaphors have included jelly, putty, ectoplasm and leets.
3. Amadeo (1989) interprets this switch as Keynes almost dropping ‘supply’ in moving from *A Treatise on Money* to a final ‘expenditure’ version of the principle of effective demand. On the present reading, the principle of effective demand relates exclusively to ‘supply’, meaning the production decisions of entrepreneurs in short-period equilibrium, but after Chapter 5 of *The General Theory*, Keynes assumes that the short-term expectations behind those production decisions are based mainly on realised results, as determined by the ‘expenditure’ decisions of consumers and investors in market-period equilibrium.
4. I owe this turn of phrase to Basil Moore.
5. For a recent critical review of the loanable funds controversy, see Bibow (2000). The continued importance of loanable funds thinking cannot be over-emphasised: the orthodox debate over policies for economic growth, based on the full-employment Solow growth model, concentrates on private and public thrift where it should be addressing the finance of investment (see the Golden Rule argument in Mankiw, 2003, pp. 192–9).
6. Boulding writes ‘The income and outgo concepts, which are essentially value aggregates of additions to and subtractions from the total stock of assets, must be distinguished clearly from the receipts and expenditure concepts. Receipts consist of the additions to liquid assets or money. Expenditures consist of the subtractions from liquid assets or money. It is hardly any exaggeration to say that the failure to distinguish clearly between receipts and income on the one hand, and between expenditures and consumption on the other, has been the source of most of the confusion in economics, and, especially in macroeconomics, in the past generation’ (quoted in Wray, 1990). If ‘outgo’ is understood as expense and ‘expenditure’ as payments, in line with current accounting conventions, this passage makes the point exactly. Boulding also uses the example of the earnings accrued by a worker (Wray, *ibid.*, pp. 3–4).