

## Chapter 17

# THE ESSENTIAL PROPERTIES OF INTEREST AND MONEY

### I

It seems, then, that the *rate of interest on money* plays a peculiar part in setting a limit to the level of employment, since it sets a standard to which the marginal efficiency of a capital-asset must attain if it is to be newly produced. That this should be so, is, at first sight, most perplexing. It is natural to enquire wherein the peculiarity of money lies as distinct from other assets, whether it is only money which has a rate of interest, and what would happen in a non-monetary economy. Until we have answered these questions, the full significance of our theory will not be clear.

The money-rate of interest—we may remind the reader—is nothing more than the percentage excess of a sum of money contracted for forward delivery, e.g. a year hence, over what we may call the ‘spot’ or cash price of the sum thus contracted for forward delivery. It would seem, therefore, that for every kind of capital-asset there must be an analogue of the rate of interest on money. For there is a definite quantity of (e.g.) wheat to be delivered a year hence which has the same exchange value to-day as 100 quarters of wheat for ‘spot’ delivery. If the former quantity is 105 quarters, we may say that the wheat-rate of interest is 5 per cent per annum; and if it is 95 quarters, that it is *minus* 5 per cent per annum. Thus for every durable commodity we have a rate of interest in terms of itself,—a

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wheat-rate of interest, a copper-rate of interest, a house-rate of interest, even a steel-plant-rate of interest.

The difference between the 'future' and 'spot' contracts for a commodity, such as wheat, which are quoted in the market, bears a definite relation to the wheat-rate of interest, but, since the future contract is quoted in terms of money for forward delivery and not in terms of wheat for spot delivery, it also brings in the money-rate of interest. The exact relationship is as follows:

Let us suppose that the spot price of wheat is £100 per 100 quarters, that the price of the 'future' contract for wheat for delivery a year hence is £107 per 100 quarters, and that the money-rate of interest is 5 per cent; what is the wheat-rate of interest? £100 spot will buy £105 for forward delivery, and £105 for forward delivery will buy  $\frac{105}{107} \cdot 100$  (= 98) quarters for forward delivery. Alternatively £100 spot will buy 100 quarters of wheat for spot delivery. Thus 100 quarters of wheat for spot delivery will buy 98 quarters for forward delivery. It follows that the wheat-rate of interest is *minus* 2 per cent per annum.<sup>1</sup>

It follows from this that there is no reason why their rates of interest should be the same for different commodities,—why the wheat-rate of interest should be equal to the copper-rate of interest. For the relation between the 'spot' and 'future' contracts, as quoted in the market, is notoriously different for different commodities. This, we shall find, will lead us to the clue we are seeking. For it may be that it is the *greatest* of the own-rates of interest (as we may call them) which rules the roost (because it is the greatest of these rates that the marginal efficiency of a capital-asset must attain if it is to be newly produced); and that there are reasons why it is the money-rate of interest which is often the greatest (because, as we shall find, certain

<sup>1</sup> This relationship was first pointed out by Mr Sraffa, *Economic Journal*, March 1932, p. 50.

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forces, which operate to reduce the own-rates of interest of other assets, do not operate in the case of money).

It may be added that, just as there are differing commodity-rates of interest at any time, so also exchange dealers are familiar with the fact that the rate of interest is not even the same in terms of two different moneys, e.g. sterling and dollars. For here also the difference between the 'spot' and 'future' contracts for a foreign money in terms of sterling are not, as a rule, the same for different foreign moneys.

Now each of these commodity standards offers us the same facility as money for measuring the marginal efficiency of capital. For we can take any commodity we choose, e.g. wheat; calculate the wheat-value of the prospective yields of any capital asset; and the rate of discount which makes the present value of this series of wheat annuities equal to the present supply price of the asset in terms of wheat gives us the marginal efficiency of the asset in terms of wheat. If no change is expected in the relative value of two alternative standards, then the marginal efficiency of a capital-asset will be the same in whichever of the two standards it is measured, since the numerator and denominator of the fraction which leads up to the marginal efficiency will be changed in the same proportion. If, however, one of the alternative standards is expected to change in value in terms of the other, the marginal efficiencies of capital-assets will be changed by the same percentage, according to which standard they are measured in. To illustrate this let us take the simplest case where wheat, one of the alternative standards, is expected to appreciate at a steady rate of  $a$  per cent per annum in terms of money; the marginal efficiency of an asset, which is  $x$  per cent in terms of money, will then be  $x - a$  per cent in terms of wheat. Since the marginal efficiencies of all capital-assets will be altered by the same amount, it follows that their order of magnitude will be the same irrespective of the standard which is selected.

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If there were some composite commodity which could be regarded strictly speaking as representative, we could regard the rate of interest and the marginal efficiency of capital in terms of this commodity as being, in a sense, uniquely *the* rate of interest and *the* marginal efficiency of capital. But there are, of course, the same obstacles in the way of this as there are to setting up a unique standard of value.

So far, therefore, the money-rate of interest has no uniqueness compared with other rates of interest, but is on precisely the same footing. Wherein, then, lies the peculiarity of the money-rate of interest which gives it the predominating practical importance attributed to it in the preceding chapters? Why should the volume of output and employment be more intimately bound up with the money-rate of interest than with the wheat-rate of interest or the house-rate of interest?

### II

Let us consider what the various commodity-rates of interest over a period of (say) a year are likely to be for different types of assets. Since we are taking each commodity in turn as the standard, the returns on each commodity must be reckoned in this context as being measured in terms of itself.

There are three attributes which different types of assets possess in different degrees; namely, as follows:

(i) Some assets produce a yield or output  $q$ , measured in terms of themselves, by assisting some process of production or supplying services to a consumer.

(ii) Most assets, except money, suffer some wastage or involve some cost through the mere passage of time (apart from any change in their relative value), irrespective of their being used to produce a yield; i.e. they involve a carrying cost  $c$  measured in terms of themselves. It does not matter for our present pur-

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pose exactly where we draw the line between the costs which we deduct before calculating  $q$  and those which we include in  $c$ , since in what follows we shall be exclusively concerned with  $q - c$ .

(iii) Finally, the power of disposal over an asset during a period may offer a potential convenience or security, which is not equal for assets of different kinds, though the assets themselves are of equal initial value. There is, so to speak, nothing to show for this at the end of the period in the shape of output; yet it is something for which people are ready to pay something. The amount (measured in terms of itself) which they are willing to pay for the potential convenience or security given by this power of disposal (exclusive of yield or carrying cost attaching to the asset), we shall call its liquidity-premium  $l$ .

It follows that the total return expected from the ownership of an asset over a period is equal to its yield *minus* its carrying cost *plus* its liquidity-premium, i.e. to  $q - c + l$ . That is to say,  $q - c + l$  is the own-rate of interest of any commodity, where  $q$ ,  $c$  and  $l$  are measured in terms of itself as the standard.

It is characteristic of instrumental capital (e.g. a machine) or of consumption capital (e.g. a house) which is in use, that its yield should normally exceed its carrying cost, whilst its liquidity-premium is probably negligible; of a stock of liquid goods or of surplus laid-up instrumental or consumption capital that it should incur a carrying cost in terms of itself without any yield to set off against it, the liquidity-premium in this case also being usually negligible as soon as stocks exceed a moderate level, though capable of being significant in special circumstances; and of money that its yield is *nil*, and its carrying cost negligible, but its liquidity-premium substantial. Different commodities may, indeed, have differing degrees of liquidity-premium amongst themselves, and money may incur some degree of carrying costs, e.g. for safe

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custody. But it is an essential difference between money and all (or most) other assets that in the case of money its liquidity-premium much exceeds its carrying cost, whereas in the case of other assets their carrying cost much exceeds their liquidity-premium. Let us, for purposes of illustration, assume that on houses the yield is  $q_1$  and the carrying cost and liquidity-premium negligible; that on wheat the carrying cost is  $c_2$  and the yield and liquidity-premium negligible; and that on money the liquidity-premium is  $l_3$  and the yield and carrying cost negligible. That is to say,  $q_1$  is the house-rate of interest,  $-c_2$  the wheat-rate of interest, and  $l_3$  the money-rate of interest.

To determine the relationships between the expected returns on different types of assets which are consistent with equilibrium, we must also know what the changes in relative values during the year are expected to be. Taking money (which need only be a money of account for this purpose, and we could equally well take wheat) as our standard of measurement, let the expected percentage appreciation (or depreciation) of houses be  $a_1$  and of wheat  $a_2$ .  $q_1$ ,  $-c_2$  and  $l_3$  we have called the own-rates of interest of houses, wheat and money in terms of themselves as the standard of value; i.e.  $q_1$  is the house-rate of interest in terms of houses,  $-c_2$  is the wheat-rate of interest in terms of wheat, and  $l_3$  is the money-rate of interest in terms of money. It will also be useful to call  $a_1 + q_1$ ,  $a_2 - c_2$  and  $l_3$ , which stand for the same quantities reduced to money as the standard of value, the house-rate of money-interest, the wheat-rate of money-interest and the money-rate of money-interest respectively. With this notation it is easy to see that the demand of wealth-owners will be directed to houses, to wheat or to money, according as  $a_1 + q_1$  or  $a_2 - c_2$  or  $l_3$  is greatest. Thus in equilibrium the demand-prices of houses and wheat in terms of money will be such that there is nothing to choose in the way of advantage between the alter-

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natives;—i.e.  $a_1 + q_1$ ,  $a_2 - c_2$  and  $l_3$  will be *equal*. The choice of the standard of value will make no difference to this result because a shift from one standard to another will change all the terms equally, i.e. by an amount equal to the expected rate of appreciation (or depreciation) of the new standard in terms of the old.

Now those assets of which the normal supply-price is less than the demand-price will be newly produced; and these will be those assets of which the marginal efficiency would be greater (on the basis of their normal supply-price) than the rate of interest (both being measured in the same standard of value whatever it is). As the stock of the assets, which begin by having a marginal efficiency at least equal to the rate of interest, is increased, their marginal efficiency (for reasons, sufficiently obvious, already given) tends to fall. Thus a point will come at which it no longer pays to produce them, *unless the rate of interest falls pari passu*. When there is *no* asset of which the marginal efficiency reaches the rate of interest, the further production of capital-assets will come to a standstill.

Let us suppose (as a mere hypothesis at this stage of the argument) that there is some asset (e.g. money) of which the rate of interest is fixed (or declines more slowly as output increases than does any other commodity's rate of interest); how is the position adjusted? Since  $a_1 + q_1$ ,  $a_2 - c_2$  and  $l_3$  are necessarily equal, and since  $l_3$  by hypothesis is either fixed or falling more slowly than  $q_1$  or  $-c_2$ , it follows that  $a_1$  and  $a_2$  must be rising. In other words, the present money-price of every commodity other than money tends to fall relatively to its expected future price. Hence, if  $q_1$  and  $-c_2$  continue to fall, a point comes at which it is not profitable to produce any of the commodities, unless the cost of production at some future date is expected to rise above the present cost by an amount which will cover the cost of carrying a stock produced now to the date of the prospective higher price.

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It is now apparent that our previous statement to the effect that it is the money-rate of interest which sets a limit to the rate of output, is not strictly correct. We should have said that it is that asset's rate of interest which declines most slowly as the stock of assets in general increases, which eventually knocks out the profitable production of each of the others,—except in the contingency, just mentioned, of a special relationship between the present and prospective costs of production. As output increases, own-rates of interest decline to levels at which one asset after another falls below the standard of profitable production;—until, finally, one or more own-rates of interest remain at a level which is above that of the marginal efficiency of any asset whatever.

If by *money* we mean the standard of value, it is clear that it is not necessarily the money-rate of interest which makes the trouble. We could not get out of our difficulties (as some have supposed) merely by decreeing that wheat or houses shall be the standard of value instead of gold or sterling. For, it now appears that the same difficulties will ensue if there continues to exist *any* asset of which the own-rate of interest is reluctant to decline as output increases. It may be, for example, that gold will continue to fill this rôle in a country which has gone over to an inconvertible paper standard.

### III

In attributing, therefore, a peculiar significance to the money-rate of interest, we have been tacitly assuming that the kind of money to which we are accustomed has some special characteristics which lead to its own-rate of interest in terms of itself as standard being more reluctant to fall as the stock of assets in general increases than the own-rates of interest of any other assets in terms of themselves. Is this assumption justified? Reflection shows, I think, that the following peculiarities, which

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commonly characterise money as we know it, are capable of justifying it. To the extent that the established standard of value has these peculiarities, the summary statement, that it is the money-rate of interest which is the significant rate of interest, will hold good.

(i) The first characteristic which tends towards the above conclusion is the fact that money has, both in the long and in the short period, a zero, or at any rate a very small, elasticity of production, so far as the power of private enterprise is concerned, as distinct from the monetary authority;—elasticity of production<sup>1</sup> meaning, in this context, the response of the quantity of labour applied to producing it to a rise in the quantity of labour which a unit of it will command. Money, that is to say, cannot be readily produced;—labour cannot be turned on at will by entrepreneurs to produce money in increasing quantities as its price rises in terms of the wage-unit. In the case of an inconvertible managed currency this condition is strictly satisfied. But in the case of a gold-standard currency it is also approximately so, in the sense that the maximum proportional addition to the quantity of labour which can be thus employed is very small, except indeed in a country of which gold-mining is the major industry.

Now, in the case of assets having an elasticity of production, the reason why we assumed their own-rate of interest to decline was because we assumed the stock of them to increase as the result of a higher rate of output. In the case of money, however—postponing, for the moment, our consideration of the effects of reducing the wage-unit or of a deliberate increase in its supply by the monetary authority—the supply is fixed. Thus the characteristic that money cannot be readily produced by labour gives at once some *prima facie* presumption for the view that its own-rate of interest will be relatively reluctant to fall; whereas if money could be grown like a crop or manufactured

<sup>1</sup> See chapter 20.

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like a motor-car, depressions would be avoided or mitigated because, if the price of other assets was tending to fall in terms of money, more labour would be diverted into the production of money;—as we see to be the case in gold-mining countries, though for the world as a whole the maximum diversion in this way is almost negligible.

(ii) Obviously, however, the above condition is satisfied, not only by money, but by all pure rent-factors, the production of which is completely inelastic. A second condition, therefore, is required to distinguish money from other rent elements.

The second *differentia* of money is that it has an elasticity of substitution equal, or nearly equal, to zero; which means that as the exchange value of money rises there is no tendency to substitute some other factor for it;—except, perhaps, to some trifling extent, where the money-commodity is also used in manufacture or the arts. This follows from the peculiarity of money that its utility is solely derived from its exchange-value, so that the two rise and fall *pari passu*, with the result that as the exchange value of money rises there is no motive or tendency, as in the case of rent-factors, to substitute some other factor for it.

Thus, not only is it impossible to turn more labour on to producing money when its labour-price rises, but money is a bottomless sink for purchasing power, when the demand for it increases, since there is no value for it at which demand is diverted—as in the case of other rent-factors—so as to slop over into a demand for other things.

The only qualification to this arises when the rise in the value of money leads to uncertainty as to the future maintenance of this rise; in which event,  $a_1$  and  $a_2$  are increased, which is tantamount to an increase in the commodity-rates of money-interest and is, therefore, stimulating to the output of other assets.

(iii) Thirdly, we must consider whether these con-

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clusions are upset by the fact that, even though the quantity of money cannot be increased by diverting labour into producing it, nevertheless an assumption that its effective supply is rigidly fixed would be inaccurate. In particular, a reduction of the wage-unit will release cash from its other uses for the satisfaction of the liquidity-motive; whilst, in addition to this, as money-values fall, the stock of money will bear a higher proportion to the total wealth of the community.

It is not possible to dispute on purely theoretical grounds that this reaction might be capable of allowing an adequate decline in the money-rate of interest. There are, however, several reasons, which taken in combination are of compelling force, why in an economy of the type to which we are accustomed it is very probable that the money-rate of interest will often prove reluctant to decline adequately:

(a) We have to allow, first of all, for the reactions of a fall in the wage-unit on the marginal efficiencies of other assets in terms of money;—for it is the *difference* between these and the money-rate of interest with which we are concerned. If the effect of the fall in the wage-unit is to produce an expectation that it will subsequently rise again, the result will be wholly favourable. If, on the contrary, the effect is to produce an expectation of a further fall, the reaction on the marginal efficiency of capital may offset the decline in the rate of interest.<sup>1</sup>

(b) The fact that wages tend to be sticky in terms of money, the money-wage being more stable than the real wage, tends to limit the readiness of the wage-unit to fall in terms of money. Moreover, if this were not so, the position might be worse rather than better; because, if money-wages were to fall easily, this might often tend to create an expectation of a further fall with unfavourable reactions on the marginal efficiency of capital.

<sup>1</sup> This is a matter which will be examined in greater detail in chapter 19 below.

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Furthermore, if wages were to be fixed in terms of some other commodity, e.g. wheat, it is improbable that they would continue to be sticky. It is because of money's other characteristics—those, especially, which make it *liquid*—that wages, when fixed in terms of it, tend to be sticky.<sup>1</sup>

(c) Thirdly, we come to what is the most fundamental consideration in this context, namely, the characteristics of money which satisfy liquidity-preference. For, in certain circumstances such as will often occur, these will cause the rate of interest to be insensitive, particularly below a certain figure,<sup>2</sup> even to a substantial increase in the quantity of money in proportion to other forms of wealth. In other words, beyond a certain point money's yield from liquidity does not fall in response to an increase in its quantity to anything approaching the extent to which the yield from other types of assets falls when their quantity is comparably increased.

In this connection the low (or negligible) carrying-costs of money play an essential part. For if its carrying costs were material, they would offset the effect of expectations as to the prospective value of money at future dates. The readiness of the public to increase their stock of money in response to a comparatively small stimulus is due to the advantages of liquidity (real or supposed) having no offset to contend with in the shape of carrying-costs mounting steeply with the lapse of time. In the case of a commodity other than money a modest stock of it may offer some convenience to users of the commodity. But even though a larger stock might have some attractions as representing a store of wealth of stable value, this would be offset by its carrying-costs in the shape of storage, wastage, etc.

<sup>1</sup> If wages (and contracts) were fixed in terms of wheat, it might be that wheat would acquire some of money's liquidity premium;—we will return to this question in (iv) below.

<sup>2</sup> See p. 172 above.

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Hence, after a certain point is reached, there is necessarily a loss in holding a greater stock.

In the case of money, however, this, as we have seen, is not so,—and for a variety of reasons, namely, those which constitute money as being, in the estimation of the public, *par excellence* ‘liquid’. Thus those reformers, who look for a remedy by creating artificial carrying-costs for money through the device of requiring legal-tender currency to be periodically stamped at a prescribed cost in order to retain its quality as money, or in analogous ways, have been on the right track; and the practical value of their proposals deserves consideration.

The significance of the money-rate of interest arises, therefore, out of the combination of the characteristics that, through the working of the liquidity-motive, this rate of interest may be somewhat unresponsive to a change in the proportion which the quantity of money bears to other forms of wealth measured in money, and that money has (or may have) zero (or negligible) elasticities both of production and of substitution. The first condition means that demand may be predominantly directed to money, the second that when this occurs labour cannot be employed in producing more money, and the third that there is no mitigation at any point through some other factor being capable, if it is sufficiently cheap, of doing money’s duty equally well. The only relief—apart from changes in the marginal efficiency of capital—can come (so long as the propensity towards liquidity is unchanged) from an increase in the quantity of money, or—which is formally the same thing—a rise in the value of money which enables a given quantity to provide increased money-services.

Thus a rise in the money-rate of interest retards the output of all the objects of which the production is elastic without being capable of stimulating the output of money (the production of which is, by hypothesis,

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perfectly inelastic). The money-rate of interest, by setting the pace for all the other commodity-rates of interest, holds back investment in the production of these other commodities without being capable of stimulating investment for the production of money, which by hypothesis cannot be produced. Moreover, owing to the elasticity of demand for liquid cash in terms of debts, a small change in the conditions governing this demand may not much alter the money-rate of interest, whilst (apart from official action) it is also impracticable, owing to the inelasticity of the production of money, for natural forces to bring the money-rate of interest down by affecting the supply side. In the case of an ordinary commodity, the inelasticity of the demand for liquid stocks of it would enable small changes on the demand side to bring its rate of interest up or down with a rush, whilst the elasticity of its supply would also tend to prevent a high premium on spot over forward delivery. Thus with other commodities left to themselves, 'natural forces,' i.e. the ordinary forces of the market, would tend to bring their rate of interest down until the emergence of full employment had brought about for commodities generally the inelasticity of supply which we have postulated as a normal characteristic of money. Thus in the absence of money and in the absence—we must, of course, also suppose—of any other commodity with the assumed characteristics of money, the rates of interest would only reach equilibrium when there is full employment.

Unemployment develops, that is to say, because people want the moon;—men cannot be employed when the object of desire (i.e. money) is something which cannot be produced and the demand for which cannot be readily choked off. There is no remedy but to persuade the public that green cheese is practically the same thing and to have a green cheese factory (i.e. a central bank) under public control.

It is interesting to notice that the characteristic

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which has been traditionally supposed to render gold especially suitable for use as the standard of value, namely, its inelasticity of supply, turns out to be precisely the characteristic which is at the bottom of the trouble.

Our conclusion can be stated in the most general form (taking the propensity to consume as given) as follows. No further increase in the rate of investment is possible when the greatest amongst the own-rates of own-interest of all available assets is equal to the greatest amongst the marginal efficiencies of all assets, measured in terms of the asset whose own-rate of own-interest is greatest.

In a position of full employment this condition is necessarily satisfied. But it may also be satisfied before full employment is reached, if there exists some asset, having zero (or relatively small) elasticities of production and substitution,<sup>1</sup> whose rate of interest declines more closely, as output increases, than the marginal efficiencies of capital-assets measured in terms of it.

## IV

We have shown above that for a commodity to be the standard of value is not a sufficient condition for that commodity's rate of interest to be the significant rate of interest. It is, however, interesting to consider how far those characteristics of money as we know it, which make the money-rate of interest the significant rate, are bound up with money being the standard in which debts and wages are usually fixed. The matter requires consideration under two aspects.

In the first place, the fact that contracts are fixed, and wages are usually somewhat stable, in terms of money unquestionably plays a large part in attracting to money so high a liquidity-premium. The conveni-

<sup>1</sup> A *zero* elasticity is a more stringent condition than is necessarily required.

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ence of holding assets in the same standard as that in which future liabilities may fall due and in a standard in terms of which the future cost of living is expected to be relatively stable, is obvious. At the same time the expectation of relative stability in the future money-cost of output might not be entertained with much confidence if the standard of value were a commodity with a high elasticity of production. Moreover, the low carrying-costs of money as we know it play quite as large a part as a high liquidity-premium in making the money-rate of interest the significant rate. For what matters is the *difference* between the liquidity-premium and the carrying-costs; and in the case of most commodities, other than such assets as gold and silver and bank-notes, the carrying-costs are at least as high as the liquidity-premium ordinarily attaching to the standard in which contracts and wages are fixed, so that, even if the liquidity-premium now attaching to (e.g.) sterling-money were to be transferred to (e.g.) wheat, the wheat-rate of interest would still be unlikely to rise above zero. It remains the case, therefore, that, whilst the fact of contracts and wages being fixed in terms of money considerably enhances the significance of the money-rate of interest, this circumstance is, nevertheless, probably insufficient by itself to produce the observed characteristics of the money-rate of interest.

The second point to be considered is more subtle. The normal expectation that the value of output will be more stable in terms of money than in terms of any other commodity, depends of course, not on wages being arranged in terms of money, but on wages being relatively *sticky* in terms of money. What, then, would the position be if wages were expected to be more sticky (i.e. more stable) in terms of some one or more commodities other than money, than in terms of money itself? Such an expectation requires, not only that the costs of the commodity in question are expected to be relatively constant in terms of the wage-unit for

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a greater or smaller scale of output both in the short and in the long period, but also that any surplus over the current demand at cost-price can be taken into stock without cost, i.e. that its liquidity-premium exceeds its carrying-costs (for, otherwise, since there is no hope of profit from a higher price, the carrying of a stock must necessarily involve a loss). If a commodity can be found to satisfy these conditions, then, assuredly, it might be set up as a rival to money. Thus it is not logically impossible that there should be a commodity in terms of which the value of output is expected to be more stable than in terms of money. But it does not seem probable that any such commodity exists.

I conclude, therefore, that the commodity, in terms of which wages are expected to be most sticky, cannot be one whose elasticity of production is not least, and for which the excess of carrying-costs over liquidity-premium is not least. In other words, the expectation of a relative stickiness of wages in terms of money is a corollary of the excess of liquidity-premium over carrying-costs being greater for money than for any other asset.

Thus we see that the various characteristics, which combine to make the money-rate of interest significant, interact with one another in a cumulative fashion. The fact that money has low elasticities of production and substitution and low carrying-costs tends to raise the expectation that money-wages will be relatively stable; and this expectation enhances money's liquidity-premium and prevents the exceptional correlation between the money-rate of interest and the marginal efficiencies of other assets which might, if it could exist, rob the money-rate of interest of its sting.

Professor Pigou (with others) has been accustomed to assume that there is a presumption in favour of real wages being more stable than money-wages. But this could only be the case if there were a presumption in

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favour of stability of employment. Moreover, there is also the difficulty that wage-goods have a high carrying-cost. If, indeed, some attempt were made to stabilise real wages by fixing wages in terms of wage-goods, the effect could only be to cause a violent oscillation of money-prices. For every small fluctuation in the propensity to consume and the inducement to invest would cause money-prices to rush violently between zero and infinity. That money-wages should be more stable than real wages is a condition of the system possessing inherent stability.

Thus the attribution of relative stability to real wages is not merely a mistake in fact and experience. It is also a mistake in logic, if we are supposing that the system in view is stable, in the sense that small changes in the propensity to consume and the inducement to invest do not produce violent effects on prices.

### V

As a footnote to the above, it may be worth emphasising what has been already stated above, namely, that 'liquidity' and 'carrying-costs' are both a matter of degree; and that it is only in having the former high relatively to the latter that the peculiarity of 'money' consists.

Consider, for example, an economy in which there is no asset for which the liquidity-premium is always in excess of the carrying-costs; which is the best definition I can give of a so-called 'non-monetary' economy. There exists nothing, that is to say, but particular consumables and particular capital equipments more or less differentiated according to the character of the consumables which they can yield up, or assist to yield up, over a greater or a shorter period of time; all of which, unlike cash, deteriorate or involve expense, if they are kept in stock, to a value in excess of any liquidity-premium which may attach to them.

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In such an economy capital equipments will differ from one another (*a*) in the variety of the consumables in the production of which they are capable of assisting, (*b*) in the stability of value of their output (in the sense in which the value of bread is more stable through time than the value of fashionable novelties), and (*c*) in the rapidity with which the wealth embodied in them can become 'liquid', in the sense of producing output, the proceeds of which can be re-embodied if desired in quite a different form.

The owners of wealth will then weigh the lack of 'liquidity' of different capital equipments in the above sense as a medium in which to hold wealth against the best available actuarial estimate of their prospective yields after allowing for risk. The liquidity-premium, it will be observed, is partly similar to the risk-premium, but partly different;—the difference corresponding to the difference between the best estimates we can make of probabilities and the confidence with which we make them.<sup>1</sup> When we were dealing, in earlier chapters, with the estimation of prospective yield, we did not enter into detail as to how the estimation is made: and to avoid complicating the argument, we did not distinguish differences in liquidity from differences in risk proper. It is evident, however, that in calculating the own-rate of interest we must allow for both.

There is, clearly, no absolute standard of 'liquidity' but merely a scale of liquidity—a varying premium of which account has to be taken, in addition to the yield of use and the carrying-costs, in estimating the comparative attractions of holding different forms of wealth. The conception of what contributes to 'liquidity' is a partly vague one, changing from time to time and depending on social practices and institutions. The order of preference in the minds of owners of wealth in which at any given time they express their feelings about liquidity is, however, definite and is all we require

<sup>1</sup> Cf. the footnote to p. 148 above.

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for our analysis of the behaviour of the economic system.

It may be that in certain historic environments the possession of land has been characterised by a high liquidity-premium in the minds of owners of wealth; and since land resembles money in that its elasticities of production and substitution may be very low,<sup>1</sup> it is conceivable that there have been occasions in history in which the desire to hold land has played the same rôle in keeping up the rate of interest at too high a level which money has played in recent times. It is difficult to trace this influence quantitatively owing to the absence of a forward price for land in terms of itself which is strictly comparable with the rate of interest on a money debt. We have, however, something which has, at times, been closely analogous, in the shape of high rates of interest on mortgages.<sup>2</sup> The high rates of interest from mortgages on land, often exceeding the probable net yield from cultivating the land, have been a familiar feature of many agricultural economies. Usury laws have been directed primarily against encumbrances of this character. And rightly so. For in earlier social organisation where long-term bonds in the modern sense were non-existent, the competition of a high interest-rate on mortgages may well have had the same effect in retarding the growth of wealth from current investment in newly produced capital-assets, as high interest rates on long-term debts have had in more recent times.

<sup>1</sup> The attribute of 'liquidity' is by no means independent of the presence of these two characteristics. For it is unlikely that an asset, of which the supply can be easily increased or the desire for which can be easily diverted by a change in relative price, will possess the attribute of 'liquidity' in the minds of owners of wealth. Money itself rapidly loses the attribute of 'liquidity' if its future supply is expected to undergo sharp changes.

<sup>2</sup> A mortgage and the interest thereon are, indeed, fixed in terms of money. But the fact that the mortgagor has the option to deliver the land itself in discharge of the debt—and must so deliver it if he cannot find the money on demand—has sometimes made the mortgage system approximate to a contract of land for future delivery against land for spot delivery. There have been sales of lands to tenants against mortgages effected by them, which, in fact, came very near to being transactions of this character.

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That the world after several millennia of steady individual saving, is so poor as it is in accumulated capital-assets, is to be explained, in my opinion, neither by the improvident propensities of mankind, nor even by the destruction of war, but by the high liquidity-premiums formerly attaching to the ownership of land and now attaching to money. I differ in this from the older view as expressed by Marshall with an unusual dogmatic force in his *Principles of Economics*, p. 581:

Everyone is aware that the accumulation of wealth is held in check, and the rate of interest so far sustained, by the preference which the great mass of humanity have for present over deferred gratifications, or, in other words, by their unwillingness to 'wait'.

## VI

In my *Treatise on Money* I defined what purported to be a unique rate of interest, which I called the *natural rate* of interest—namely, the rate of interest which, in the terminology of my *Treatise*, preserved equality between the rate of saving (as there defined) and the rate of investment. I believed this to be a development and clarification of Wicksell's 'natural rate of interest', which was, according to him, the rate which would preserve the stability of some, not quite clearly specified, price-level.

I had, however, overlooked the fact that in any given society there is, on this definition, a *different* natural rate of interest for each hypothetical level of employment. And, similarly, for every rate of interest there is a level of employment for which that rate is the 'natural' rate, in the sense that the system will be in equilibrium with that rate of interest and that level of employment. Thus it was a mistake to speak of the natural rate of interest or to suggest that the above definition would yield a unique value for the rate of interest irrespective of the level of employment. I had

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not then understood that, in certain conditions, the system could be in equilibrium with less than full employment.

I am now no longer of the opinion that the concept of a 'natural' rate of interest, which previously seemed to me a most promising idea, has anything very useful or significant to contribute to our analysis. It is merely the rate of interest which will preserve the *status quo*; and, in general, we have no predominant interest in the *status quo* as such.

If there is any such rate of interest, which is unique and significant, it must be the rate which we might term the *neutral* rate of interest,<sup>1</sup> namely, the natural rate in the above sense which is consistent with *full* employment, given the other parameters of the system; though this rate might be better described, perhaps, as the *optimum* rate.

The neutral rate of interest can be more strictly defined as the rate of interest which prevails in equilibrium when output and employment are such that the elasticity of employment as a whole is zero.<sup>2</sup>

The above gives us, once again, the answer to the question as to what tacit assumption is required to make sense of the classical theory of the rate of interest. This theory assumes either that the actual rate of interest is always equal to the neutral rate of interest in the sense in which we have just defined the latter, or alternatively that the actual rate of interest is always equal to the rate of interest which will maintain employment at some specified constant level. If the traditional theory is thus interpreted, there is little or nothing in its practical conclusions to which we need take exception. The classical theory assumes that the banking authority or natural forces cause the market-rate of interest to

<sup>1</sup> This definition does not correspond to any of the various definitions of *neutral money* given by recent writers; though it may, perhaps, have some relation to the objective which these writers have had in mind.

<sup>2</sup> Cf. chapter 20 below.

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satisfy one or other of the above conditions; and it investigates what laws will govern the application and rewards of the community's productive resources subject to this assumption. With this limitation in force, the volume of output depends solely on the assumed constant level of employment in conjunction with the current equipment and technique; and we are safely ensconced in a Ricardian world.