The Trade Cycle Theories of R. G. Hawtrey and F. A. von Hayek, With Particular Reference to the Rôle Attributed by Each to the Rate of Interest.

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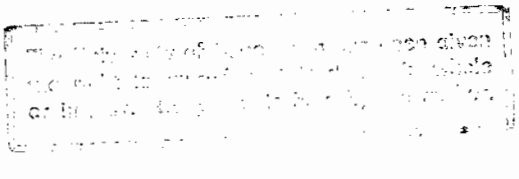

INTRODUCTION

It was originally intended that this essay should be confined to a study of interest alone, in the context of the trade cycle theories of R. G. Hawtrey and F. A. v. Hayek. However it was found that much of the significance of the rate of interest was lost unless changes in the rate were continuously related to the process of the cycle as a whole. There has, therefore, been inevitably a "widening" of the subject matter (perhaps at the sacrifice of "deepening"!) to include other aspects of their theories which, while not directly related to interest, nevertheless do help towards a clearer understanding of the context in which it is set. The writer is conscious of the omission of any discussion of the "Austrian" theory of capital as such, on which much of Hayek's approach to the trade cycle is based, but it was felt that to do justice to such a complex topic little short of a "thesis within a thesis" would have been adequate.

The essay consists of three parts. The first two deal with the theories of Hawtrey and Hayek separately, while Part Three includes some general conclusions suggested by the discussion.

Part One

For R. G. Hawtrey economic equilibrium is attained when "...output is normal and the consumers' income and outlay (are) equal to one another and proportional to the price level,"[1] while the trade cycle is seen as a cumulative departure away from equilibrium caused by fluctuations in aggregate money demand.

> The trade cycle is a monetary phenomenon because general demand is itself a monetary phenomenon.[2]
>
> More fundamentally it might be described as a fluctuation in demand, or in the flow of money which constitutes demand, for from that all the other fluctuations are derived.[3]
>
> A depression is essentially a deficiency of general demand. If there is a deficiency of general demand, there must be a depression, if there is no deficiency of general demand, there cannot be depression.[4]

Hawtrey thus relegates all other non-monetary sources of instability to a position of complete subordinance to changes in the level of money demand. Only in so far as the aggregate of money expenditures changes, through a change in the effective amount of money relatively to the supply of goods and services, can a general expansion or contraction of economic activity develop.

In contrast to Hawtrey's preoccupation with total money demand as such, Hayek is much more interested in the effects of changes in the volume of money on the underlying structure of production, and in the way these changes influence both the types of goods produced and the methods used. For Hayek a necessary condition for economic equilibrium is that entrepreneurs' decisions regarding the allocation of scarce resources between provision for consumption in the near future, and for consumption in the more distant future, should faithfully reflect consumers' preferences between consuming and saving. Cyclical fluctuations result from a failure to adapt production to these preferences. Nevertheless, like Hawtrey, Hayek looks to money for the immediate source of instability.

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1. R. G. Hawtrey, Art of Central Banking, Longmans, 1932, p.110. Consumers' outlay refers to the total expenditure out of income, and includes the purchase of capital assets, and of rights in capital assets. S ee op.cit p.84-115.

2. Hawtrey, Capital and Employment, Longmans, 1937, p.124.

3. Hawtrey, The Trade Cycle and Capital Intensity, Economica, Jan. 1940, p.8.

4. Capital and Employment, p.109.

It is money, making possible indirect exchange, that loosens the closer relationships of a barter economy so that "...a range of indeterminateness appears within which movements can originate leading away from equilibrium"(1)

We shall now briefly describe Hawtrey's theory in general terms, before considering in greater detail those aspects of it which are directly related to the rate of interest.

II

If an initial position of (Hawtreyan) equilibrium is assumed, so that the rate of flow of goods towards consumption is matched by a similar flow of money, this stability will be disturbed by any unilateral change in the flow of money. The credit policy of banks, (based as it is primarily on the level of their cash reserves rather than on the level of economic activity,) is seen as the most important source of instability.

Hawtrey suggests that a policy of credit expansion or contraction, involving an adjustment in the discount and short term rates of interest will affect one class immediately, - the"Traders" - who "either produce or buy goods with a view to subsequent resale",(2) and who finance their stocks awaiting process, or resale largely with short term loans from the banks. A fall in the short term rate will induce those traders who are able easily to vary their stock level, to increase their stocks, according to the "elasticity of (their) demand for the convenience"(3) of having larger supplies on hand; and conversely a rise in the short term rate will induce a general reduction in the stock level.

The proportion of the value of stocks to the rate of turnover is raised by speeding up the rate at which supplies are ordered from producers. The proportion of current outlay on costs compared with current receipts from sales increases, and there will therefore be what Hawtrey calls a "release" of cash into circulation.

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1. F. A. Hayek, Monetary Theory and the Trade Cycle, Jonathan Cape, 1933, p.86.

2. Hawtrey, Currency and Credit, Longmans, 1928, p.8.

3. R. S. Sayers, Modern Banking, Oxford Univ. Press, 1947, p.141.

Producers' receipts from sales rise correspondingly and they are encouraged to expand output to meet the increased demand. Additional labour etc., is hired, so that wage bills and aggregate money income grows.

The higher level of money incomes induces an increase in consumers' outlay, and in the demand for consumers' goods. As traders' turnover rises, goods flow out of stock more rapidly and in an effort to maintain the stock level at its higher figure, traders' further speed up their orders to producers. Output, employment, and money incomes continue to grow and stimulate further activity. The general expansion may possibly become independent of any further relaxation of credit as firms draw upon their own money balances to finance the greater volume of working capital required to facilitate the higher rate of turnover, i.e. there will be a transfer of funds from inactive to active balances. Thus although the initial relaxation of credit may have been quite slight, it gives rise to a cumulative increase in output and money incomes.

While there are unemployed resources to be drawn upon, and productive capacity in general is being operated at less than the optimum rate, the larger output can be produced without involving much increase in unit costs or selling prices. But as full employment of resources is approached, the supply of factors becomes less elastic and unit costs rise.

> As more and more producers become employed up to capacity they will tend to raise prices. And as the dealers experience more and more difficulty in placing orders and in securing early delivery of those placed, they will tend to defend their stocks against depletion by raising prices against the consumer. Here we have that rise in prices which the quantity theory of money tells us ought to occur. It comes about because people spend the money they receive but only in so far as their expenditure cannot be met by increased production." (1)

Once the rise in prices has become general, expectations that prices will continue to rise create a speculative demand for goods and inactive money balances are reduced to a minimum. The velocity of

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1. Hawtrey, Trade and Credit, Longmans, 1928, p.92.

circulation rises sharply, adding fuel to the developing inflation.

The volume of bank deposits grows as money incomes increase, and so does the proportion of total income-earners who receive their earnings in cash, involving an absolute fall in the level of the banks' cash reserves. Sooner or later the reserves fall to a dangerously low level, and the banks take steps to replenish them. Loans are not renewed, and further borrowing is discouraged by raising the discount and short term rates. This reversal of policy will usually be more prompt under a gold standard than under inconvertible paper because internal convertibility may be threatened at an early stage by an external drain of gold as the balance of trade becomes adverse owing to the rise in costs and incomes.(1) The higher bank rate will be reinforced by the sale of securities in the open market, and long term rates will also move upwards. These measures however may not appear to be immediately effective.

Traders will now attempt, Hawtrey suggests, to reduce the level of inventories in face of the rise in the cost of financing them. But this need not have any immediate effect on employment or output because of the outstanding orders that producers have still to work through. Cash continues to be withdrawn from the banks, and more stringent measures are adopted.

> They (the banks) may really have checked the fundamental danger of the position in that they have effectively stopped the stream of new orders from the merchants to the manufacturers, and yet the demand for fresh credits and the drain of cash into circulation may go on undiminished. The consequence may be a state of panic among the bankers who, unaware of the cause of the apparent ineffectiveness of the measures they have taken despair of saving themselves from failure, refuse credits recklessly, call in existing loans regardless of the embarrassment of the debtors and precipitate a series of bankruptcies among their customers and themselves.(2)

Had appropriate action been taken before the inflation got out of hand, a moderate raising of the bank rate would probably have been effective in stabilising the economy at a high level of activity. But as Hawtrey shows, what usually happened was that

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1. Hawtrey, Currency and Credit, p.132.
2. Ibid p.28.

> the restrictive measures were applied too late... the pressure thus overdue had to be intensified.... the transition from activity to depression was suddenly hastened by the outbreak of a financial crisis.(1)

Having worked through outstanding orders producers adapt their working capital to the smaller output required to satisfy the slower rate at which orders are placed by traders. Employees are discharged and wage bills cut reducing total money incomes. The demand for consumer goods shrinks, and to prevent excessive accumulation of unsold goods, traders lower prices and reduce further their orders. Profits disappear and unemployment grows. The demand for credit is adjusted to the lower level of activity, outstanding loans are repaid, and money balances are accumulated in preference to goods which are losing value over time as price expectations are realised.

> Depression damps down borrowing, diminished borrowing brings with it curtailed demand, curtailed demand means more depression.(2)

The repayment of loans, and the discouragement to borrowing soon restore cash reserves to a level more appropriate to the new level of deposits. The high bank rate imposed at the end of the boom will be lowered, and borrowing conditions made less onerous. The demand for credit however has become interest-inelastic due to the general pessimism regarding the future level of prices, and to the feeling that more favourable contracts with the factors of production will be possible later on.

Under these conditions a 'cheap money' policy may fail to promote an early revival, which Hawtrey considers, ".... is a much more serious gap in credit control than the failure of dear money to check activity. The latter amounts to no more than a delay.... there is no question of dear money being completely ineffective."(3) The banks, finding few other outlets for their excess cash will resort to the purchase of securities and the long term rate may fall to a low level. Ultimately

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1. Hawtrey, Capital and Employment, p. 123.
2. Hawtrey, Trade and Credit, p. 97.
3. Hawtrey, Capital and Employment, p. 86.

this expenditure finds its way into general circulation, and in conjunction with measures such as deficit financing and public works expenditure[1] may break the "vicious circle of deflation."

Dealers will again consider it worth while to take advantage of the lower short-term rates by increasing their stocks. Orders to producers are increased, and cash is "released". Producers expand output and take on more labour. Incomes rise and traders' rate of turnover becomes more rapid as demand revives, and orders are speeded-up.... "Activity causes credit expansion, credit expansion increases demand, demand evokes greater activity."[2] Since "... a small or casual credit movement whether expansion or contraction tends to exaggerate itself,"[3] another boom may easily develop out of the conditions prevailing towards the end of the previous depression, because these conditions usually imply excess cash reserves in the hands of the banks, and low short term rates.

It is hoped that this rough outline of Hawtrey's theory is yet sufficient to indicate the importance attributed by him to the inter-dependence of the short-term rate of interest and the level of traders' stocks. These two factors jointly occupy a central position in his theory as the main channels through which the volume of money ebbs and flows.

We shall now consider the validity of this close relationship between interest and inventories, and the reasons given by Hawtrey to support his contention regarding the much looser connection between interest and investment in fixed capital assets.

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1. "The intervention of the Government with its public works or other capital outlay is a device for injecting money (releasing cash) into the economic system on the assumption that the banking system cannot perform the necessary service." Ibid p. 127.

2. Hawtrey, Trade and Credit, p. 97.

3. Ibid.

III

We have seen that his account of the trade cycle hinges on the sensitivity of traders'[1] stocks to changes in the short term rate of interest. The marginal prospective yield of stocks in terms of "convenience" is equated to the marginal cost of borrowing in terms of the rate charged by the banks for the necessary loan. Therefore, even "for the sake of a very trivial saving,"[2] traders will reduce their stocks if the short term rate rises, and vice versa.[3]

If a change in the rate was the only factor that a trader had to consider in determining his buying policy, no one would deny that the correlation suggested by Hawtrey is as important as he claims. But in reality stock levels are determined, inter alia, also by the nature of the commodity in question, and the predictability of future demand and supply conditions, so that the importance of the rate in any particular case, depends on the weight given by the entrepreneur to these other considerations. We must therefore exclude from the influence of interest, goods which are perishable, have high storage costs (rent insurance etc.), have inelastic supply conditions in the short period, and those which are subject to wide fluctuations in the level of demand, and which have a high rate of turnover.[4]

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1. Hawtrey intends the terms "trader" and "dealer" to be interpreted in a wide sense. Although manufacturers regulate their working capital mainly with reference to output, in so far as they supply retailers direct from stocks of finished goods awaiting sale, or themselves maintain an appreciable stock of raw materials awaiting process, the level of which can be varied without prejudicing current output, then they too will be susceptible, in the same way, to changes in the short-term rate.

2. Hawtrey, Capital and Employment, p.83.

3. "We may suppose a trader who sells £10,000 worth of goods a month, and who holds stocks to an average total value of £15,000 to provide £5,000 of this from his own capital and to borrow the remaining £10,000. If he pays his banker 5%, the charge is £500 p.a. If the charge is raised to 7½% or £750 p.a. he can probably reduce the average stock held to say £12,000 and bring down the interest charge to £525 p.a. on the £7,000 borrowed. To a trader with a turnover of £120,000 p.a. and an income which may be put at 3% or £3,600, a saving of £225 is by no means negligible." Ibid, p.83.

4. The smaller the average interval between purchase and sale, the smaller the proportionate increase in cost due to a rise in the rate e.g. for goods that remain in stock for a month on the average, a rise in the rate of 4% increases total cost by ⅓%

Perhaps the most important factor influencing decisions will be the expected future level of costs and selling prices, especially during the course of the cycle. Dealers who expect supplies to be forthcoming at appreciably lower prices in the future will delay purchases regardless of changes in the rate, and in the same way expectations that selling prices will rise in the near future will encourage the advancement of orders. Although under conditions of relative stability expectations that prices will rise may be cancelled out by equal expectations that prices will fall, and the rate may then be influential, once an actual movement of the general price level has got under way, expectations of profits or losses from this source will completely submerge the usually smaller changes in the cost of borrowing.

It is more likely therefore that decisions regarding the appropriate relations between stocks and turnover are made with reference to one or more of the above factors, particularly during periods of transition, while the rate of interest is seldom the deciding factor.(1) Keynes has suggested that investment in inventories is influenced by credit conditions more through the banks willingness to accommodate "... the fringe of unsatisfied borrowers.... than in the cheapness or dearness of money itself."(2) The investment of borrowed funds in working capital is insensitive to changes in the short term rate, "unless these changes create an expectation of changes in prices."(3)

These doubts, apparently, did not impress Hawtrey at first. He emphasized again in "Capital and Employment" that,

> even a moderate rise in the short term rate of interest is a new factor, for what it is worth, in the calculations of every trader who considers buying goods with borrowed money. The psychological reactions may be helpful but are not essential to the power of the bank rate.(4)

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1. Hawtrey explicitly excludes primary products from changes in the rate, and stresses the importance of manufactured goods whose price is more stable due to (a) monopolistic competition and resale price maintenance, and (b) their short-term elasticity of supply. See Capital and Employment p.84-5 and Art of Central Banking p.160.

2. J. M. Keynes, Treatise on Money, Macmillan, 1930, Vol II p.364.

3. Ibid p.363.

4. Op. cit. p.121.

However, later, in a study of the Bank Rate in England during the nineteenth century,(1) Hawtrey does give more weight to "expectations" as a factor reinforcing the more direct influences of the short-term rate. He concludes that the growing sensitivity of business to changes in the rate, especially after 1873, was ".... partly due to traders having learnt what to expect. If when Bank rate rose to 6%, they all expected one another to become reluctant buyers, they would become reluctant buyers, and business would decline without the rate being raised any further."(2)

We have now to consider another way in which the short-term rate can be expected to influence the level of economic activity, i.e. the relation between the short term and long-term markets for loans, and the degree to which changes in the former are transmitted to the latter. Changes in the short-term rate do, of course, induce corresponding changes in the long-term rate mainly because the two markets are to some extent both substitute sources of finance capital and also alternative outlets for free capital in search of investment. Entrepreneurs can chose between long term loans (debentures etc.,) and bank overdrafts, commercial bills etc., depending on the nature of the firm, while banks must distribute their excess liquid reserves between gilt edged securities and short term loans, discounts etc. A fall in the short-term rate therefore, usually induces some transfer of borrowers from the long-term to the short-term market and vice versa, leading to a corresponding fall in the long-term rate.(3) But it must be remembered that the actual levels of the two rates are each determined in quite a different way. The former is usually set with reference to current changes in the banks' cash reserves, while the latter is determined by the forces of demand and supply in the investment market. Equilibrium in this market is reached when the inflow of funds seeking investment (savings plus bank loans to speculators) is equal to the supply of securities available for sale.

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1. R. G. Hawtrey, Century of Bank Rate, Longmans, 1938.

2. Ibid. p. 61.

3. Hawtrey suggests that security prices will be raised (and the long-term will fall) also by the increased holdings on the part of security dealers whose finance costs have fallen due to the lower short-term rate on bank loans, see Capital and Employment, p. 63 and 87.

Should the demand for securities exceed their supply at the existing prices, security values will rise and the long-term rate will fall. Dealers in securities will reduce their holdings, and promoters will be encouraged to float new issues under the more favourable conditions. What then is Hawtrey's attitude to the suggestion that the importance of changes in the short-term rates lies, rather, in their influence on the long term rate and investment in fixed capital? Hawtrey agrees that the same change in both the long and the short-term rate is likely to have the greater effect on investment for the longer period because of the greater difference made to total cost, but only if the change in the short-term rate is regarded as a permanent change:

> If the rate were to rise from say 4% to 5% for all terms long and short, the additional cost to a trader who holds goods in stock for three months would be ¼% whereas the present value of an instrument with a life of thirty years and rendering services worth £10 p.a. would be reduced from £175 to £154 or by 11%. But if the rise to 5% were only expected to last for three months, the effect in the second case would be precisely the same as the first, i.e. ¼%.(1)

However, the factor that Hawtrey believes to be most significant in estimating the relative influence of the two rates, is the promptitude with which borrowers in each market can be expected to respond to changes. On this basis he contends that in the short-period, working-capital is far more sensitive than is investment in fixed capital, and mainly for the following reasons:

Firstly, the need for market-specialists, separating the borrowers (promoters and entrepreneurs) from the investing public, tends to dampen the response of investment in fixed capital to changes in the supply of funds. The immediate effect of such changes is felt, not by the potential buyers, or producers of capital goods, but by the security dealers. Only after the prices of existing securities have been altered will the production of capital goods be affected. In contrast, the influence of the short-term rate is not blunted in this manner because traders are in direct contact with producers. The formers' reaction to a change in

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1. Century of Bank Rate, p. 189.

credit conditions can therefore be expected to be transmitted much more rapidly to producers, and thence to the general public, in the shape of a compression or enlargement of total money incomes. Thus due to the existence of investment "middle-men" there is an appreciable time-lag between changes in the long-term rate and their effects on the volume of investment in fixed capital.

Secondly, investments in durable capital instruments usually require a long period of preliminary preparation, "... both financial and technical which nearly always intervenes between the first initiation of a project, and the start upon the installation of the capital equipment for it."(1) Further, once the initial outlay has been made, subsequent investments needed to complete the project become relatively insensitive to a subsequent change in the rate.(2) For these reasons Hawtrey believes that,

> A small change in the long term rate of interest, though it may be assumed ultimately to give a bias to the calculations of some at any rate of the promoters, could not be expected to have any quick or measurable effect.(3) (4)

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1. Hawtrey, Capital and Employment, p.112.

2. Hayek develops this point more fully in an essay entitled "Investment that Raises the Demand for Capital," reprinted in Profits, Interest and Investment, Routledge, 1939, p.73.

3. Hawtrey, Century of Bank Rate, p.171.

4. Another factor tending to insulate the rate of new capital formation from changes in the credit policy of the banks, and from developments in the long-term investment market, has been the growing practice of financing capital extensions etc., from other sources, particularly from reserves of undistributed profits. Investment plans are thus made without direct reference either to the short or long-term, rate of interest. A recent survey of the sources of capital funds raised by industries (large companies only) in the U.S.A. during 1948 illustrates the importance of this development. An extract follows:

Industry.	Ploughed Back Earnings & Investment	Bank Loans	Bond Issues	Stock Issues	Others
1. Manufacturing					
Food	52%	23%	31%	1%	-12%
Tobacco	30	-20	70	14	6
Rubber	103	- 2	- 1	- 2	3
Petroleum	75	6	5	4	10
Chemicals	70	- 1	6	-	25
Iron and Steel	64	less than 5	5	1	30
Non ferrous metals	78	- 1	13	3	7
Automobiles	121	less than 5	11	-	-32
2. Retail Trade	132	4	18	2	-55
3. Utilities					
Railroads	82	-	24	-	- 6
Electric and Gas	29	3	50	15	3
Communications	24	3	44	23	7

Source: "Differences in Large Corporation Financing 1948", Federal Reserve Bulletin, Vol. 35 No. 6. June 1949.

In contrast, Hawtrey believed that substantial changes in the amount of working capital can be made quickly, and without involving any fundamental readjustments in organisation. It is a simple matter for traders to vary the ratio of stocks to turnover, and from the point of view of production, it is easier in the short run to adjust the output of consumers goods than to adjust the production of the capital goods industries. Hawtrey does not, of course, deny that changes in the long-term rate will ultimately result in much more fundamental adjustments being made to the organisation of production than could be effected by the short-term rate. But from the point of view of credit regulation, 'ad hoc' measures which evoke a rapid adjustment in the level of incomes and prices are much more potent means of maintaining equilibrium, than those which, although exerting a greater influence in the long run, act comparatively slowly. Hawtrey considers the time factor to be of the utmost importance in this connection because a credit economy is "... inherently unstable, expansion or contraction (become) cumulative... therefore credit regulation depends not on the point in the credit system where the response is greatest, but on that where the response is promptest."(1)

Hawtrey is equally insistent that it is misleading to consider changes in long-term capital investment as being the real cause of fluctuations in incomes and employment. He claims that while it may appear to be the increase in capital investment which lifts the economy out of depression and stimulates revival, in fact this additional outlay is itself merely the reaction to a prior increase in consumers' expenditure induced by the expansion of credit at the lower short-term rates. Thus although long-term capital investment accompanies the upswing "... it does not follow that such an expansion is an originating cause of activity. I should regard it rather, as a consequence"(2). In the same way he discounts the idea that the misinvestment of bank credit during the boom is ever likely to be serious. enough to involve a ~~sufficient~~ check to

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1. Hawtrey, Art of Central Banking, pp. 383-384.

2. Ibid, p.388.

activity likely to lead to crisis and depression.(1) The misinvestment that does occur cannot be laid at the door of expansionist credit policies, since miscalculations are inherent in a system of private enterprise anyway, and are merely intensified by over optimism during the boom. In fact Hawtrey goes so far as to suggest that it is misleading to argue that those administering the supply of credit should be at all concerned about its allocation between borrowers, or about the possibility of its mis-use in excessive speculation. "Such apprehensions once more disregard the essential object of the creation of credit, the extension of demand." (2) Apparently, as long as the additional money reaches the pockets of consumers with the minimum of delay, it is immaterial who the borrowers are, or for what purposes the money is used!

This interpretation of the objects of monetary policy and credit regulation is in complete contrast to the opinions expressed by Hayek on this subject. As we mentioned above equilibrium for Hayek depended on maintaining the correct proportion between the production of capital goods, and the production of consumers goods, a proportion determined by consumers. Thus for him the essential task of credit administration is the allocation of funds, since the over-development of either industries leads inexorably to subsequent disaster. Credit expansion is however a policy to be avoided unless "... it were possible to inject the required additional quantities of money in such a way into the economic system that the proportion between the demand for consumers' goods would not be affected."(3) But alas, this "is no doubt a task which cannot be solved in practice."(4)

These finer points of administration hardly arise in Hawtrey's view because they are largely solved automatically in the capital market itself, "... the equalising function of the investment market will come into play to limit the amount of capital outlay to the available resources"(5

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1. "For bank advances are made for the most part for working capital. A revival of productive activity requires additional working capital, and the additional working capital simply goes to those industries which experience an increase of demand. Additional working capital does not extend the capacity of an industry or cause "over development". Ibid, p.291.

2. Ibid, p.291.

3. F.A. Hayek, Prices and Production, Routledge, 1935, p.106.

4. Ibid p.106.

5. Hawtrey, Century of Bank Rate, p.183.

It only remains therefore, to control the "inflationary supplement", i.e. those funds which have "spilled over" from the short-term, into the long-term market.

In order to clarify the rôle he attributes to investment in fixed capital during the trade cycle, Hawtrey introduces into his analysis[1] two concepts designed to draw a distinction between capital extensions which are made to increase output, and those made for the purpose of decreasing unit costs. An increase in output which leaves the amount of capital per unit unchanged is called a "widening" of capital, while an increase in capital per unit of output is called a "deepening" of capital. Thus the former type of investment usually follows a rise in selling prices, and is the entrepreneurs method of taking advantage of the more favourable market. Greater profits can be achieved merely by duplicating existing equipment, and expanding output. In contrast, "deepening" aims at lowering production cost per unit by the transition to more "roundabout" methods, or to use the 'Austrian' terminology, by lengthening the period of time between the initial application of labour etc., and the emergence of the finished product. This involves changing the method of production, which requires that, ceteris paribus, the rate of interest should fall. (i.e. the lengthening of the investment period needs a relative increase in the "supply of waiting.").

In less abstract terms, the deepening of capital involves the substitution of instrumental investments for direct human labour, made possible by a fall in the cost of the former. Such substitution lowers the production cost per unit of output, if the maintenance and depreciation cost of the new machinery falls short of the annual labour cost by an amount exceeding the interest charge[2] on the initial cost of the machinery. It might be concluded therefore that investment in capital deepening is immediately influenced by any change in either the initial cost of capital goods, or in the long-term rate of interest.

In practice, however, Hawtrey believes the response of "deepening" to changes in the long-term rate to be particularly sluggish, compared with the response of "widening" investment, to an expected rise in selling prices. He supports this view for two reasons.

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1. In Capital and Employment, 1937, and Century of Bank Rate, 1938.
2. Calculated at the current long-term rate.

Firstly, the actual return from the installation of more durable, more labour-saving equipment cannot be predicted with any degree of certainty. Cost-saving capacity is largely a matter of conjecture, especially if its annual charge for depreciation and maintenance represents a large proportion of its total cost.(1) Hawtrey draws attention to the lack of realism in what he calls the "sausage theory" of capital,(2) i.e. the assumption that entrepreneurs invest capital up to the point at which the marginal productivity of the increment of capital just equals the rate of interest. In practice there is no such clear cut division between investments yielding more, and investments yielding less than the market rate, but only "... a broad zone of uncertainty merging insensibly on the one side into the remunerative, and on the other into the unremunerative"(3).

Secondly, the expected cost-saving capacity of the additional equipment must always be based on a particular level of output, to which the machine contributes.(4) But if the level of demand, and therefore output is subject to severe fluctuations during the course of a trade cycle this additional source of uncertainty is likely to discourage all but the very optimistic entrepreneurs from implementing new methods, even at very favourable interest rates.

On these grounds, the general feelings of optimism or pessimism which colour entrepreneurs' expectations about the future, are likely to far outweigh interest as determinants of the rate of investment in projects of a capital deepening nature. It is on the basis of these considerations that Hawtrey builds his explanation of the behaviour of capital investment during the cycle.

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1. A further point of importance is the rate of obsolescence. The shorter the period over which the machine can be expected to pay for itself, the more likely is obsolescence to overshadow the rate of interest in the mind of the entrepreneur, see Henderson, Significance of the Rate of Interest, Oxford Economic Papers, 1938-40, p. 4 and 5.

2. Hawtrey, Capital and Employment, pp. 103-4.

3. Ibid, p.47.

4. i.e. on how intensively the machine is expected to be used.

He interprets the depression as being due to the contraction of aggregate demand following the restriction of short-term credit.(1) Working capital is liquidated, bank advances are repaid, and idle money balances are gradually accumulated. Output falls, unemployment grows, and incomes and demand are further reduced.

Contracting demand, and falling prices provide little encouragement for investment of a 'widening' type, so that the demand for investible funds for this purpose falls. At the same time there is likely to be an increasing flow of banks' funds seeking suitable investment, as their reserve positions improve. Security prices rise, and the long-term rate falls to a low level. In theory this ought to induce an expansion of investments for the "deepening" of capital, and so provide the stimulus for revival. However, the fall in the rate comes at a time when long-term investment is even less sensitive to changes in the rate than usual. The contraction of demand has given rise to doubts whether the level of output justifies further investment which may never be sufficiently exploited, doubts which are supported by the growing idleness of existing equipment, and the development of excess capacity.(2) In Hawtreys words,

> the proceeds of liquidation of working capital coming into the investment market call for a great intensification in the deepening process, at a time when the deepening process is itself much less responsive than usual.(3)

The discouragement to 'widening', and the failure of 'deepening' to fill the gap, lead to a 'glut' of capital in the investment market, which has its parallel in the "Credit Deadlock" which occured when falling prices rendered the demand for short-term credit insensitive to the short-term rate; the 'glut' is not caused by the depression reducing capital outlay, but by the influx of these redundant funds from the short-term market.(4) This process is important for Hawtrey since it intensifies

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1. See above, pp. 7 - 8.

2. "The practical application of the deepening process does often involve a concurrent increase of output... Consequently the fluctuations in consumption demand do affect the deepening as well as the widening of capital." Hawtrey, Century of Bank Rate, pp. 181 - 2.

3. Hawtrey, Capital and Employment, p. 79.

4. Hawtrey, Capital and Employment, pp. 126 - 7.

the tendency to 'absorb' cash, which originated with the restrictive credit policy and the subsequent contraction of demand, and amplifies "the vicious circle of deflation".(1)

However, the capital glut can only be a temporary condition, since it was not caused by an absolute shortage of openings for investment, but by the fall in consumers' demand which tended to make investment generally, less attractive. New inventions become available, and existing equipment wears out and requires replacement. Entrepreneurs are likely to take advantage of the low rate prevailing in the long-term market by incorporating these improvements. But Hawtrey is adamant that in itself this will not be sufficient to initiate revival. In the same way that he traces the origin of depression to the fall in demand rather than the reduction in the investment, so the revival of the economy itself must wait upon the expansion of consumers' demand. This can only occur if the 'absorption' of each is replaced by a 'release' of cash, encouraged by an 'easy' credit policy, and reinforced by Government measures. As the additional cash becomes income, "... and general demand begins to expand, the widening process will be resumed, savings will increase, and the deepening process will become operative..."(2)

IV

The characteristic feature of Hawtrey's approach is his emphasis on the instability of money demand. It follows therefore, that for him the aim of monetary policy must be to coordinate the supply of money with the flow of real income, in such a way that "... equilibrium requires the level of wages to remain unchanged."(3) We have seen that he believes

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1. Kaldor questions the emphasis placed on this "secondary" absorption of cash, and feels that it is quite subsidiary to the fact that capital investment itself has shrunk. The fall in incomes and demand following the reduction in capital outlay is, he suggests, in no way dependent on the immobilisation of traders' working capital in the investment market..." When capital outlay falls there will be a decrease of savings (if the propensity to save is unchanged, while incomes fall) and hence there will not be (or need not be) any considerable absorption of cash by the investment market." N. Kaldor, "Mr. Hawtrey on Short, and Long Term Investment", Economica, Nov. 1938, p. 466 n.

2. Hawtrey, Capital and Employment, p. 127.

3. Ibid, p. 264.

requisits date quickly enough, there would be great difficulty in interpreting correctly even a weighted statistical overage. Alternatively if the 'claim' of each firm for credit accommodation were to be based on the individual rate of profit currently being earned, the attempt to equalise the rate of interest with the rate of profit would lead to the paradox that bankers would be forced to discriminate in their charges against the more successful businesses, and in favour of those with inferior prospects.

Part Two

While Hawtrey's approach to the problem of the Trade Cycle seems to have altered little, except perhaps in matters of detail, since his earliest writing on the subject, Hayek's theory has undergone what appears to be a significant change in recent years. His early work in this field drew heavily on the 'natural' rate of interest theories of Wicksell and Von Mises, and the rate itself occupied a central position in his explanation of the process of cumulative expansion and contraction. In contrast, his later work results from his realisation of the need for a shift of emphasis from interest to profits. The development of Hayek's thought has nevertheless an intrinsic homogeneity derived from his conviction that cyclical fluctuations can only be explained satisfactorily in terms of 'real', as distinct from purely monetary changes. In this respect his theories contrast strongly with those of Hawtrey.

This part of the essay will deal with the origin and development of the ideas outlined in "Monetary Theory and the Trade Cycle", and "Prices and Production", and with the revised treatment contained in "Profits, Interest and Investment", and related essays. As with Hawtrey, we shall be concerned not with Hayek's theory of interest as such, but rather with the use he makes of interest in formulating an explanation of the trade cycle.

II

In many ways Hayek's earlier work on the trade cycle owes much to Wicksell's pioneering study of the behaviour of a money economy.

Wicksell distinguished between the effects of borrowing which took place under conditions of barter, and borrowing in a money economy.(1) In the former case it was goods which were loaned and borrowed, in the latter case it was money that was borrowed, and goods which were bought. In the former case therefore a single equilibrium between the demand and supply of loanable goods was determined, but in the latter case equilibrium had to be established both between the demand for, and supply of, money capital, and between the demand for, and supply of 'real' capital, against which the borrowed funds would be bid.

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1. K. Wicksell, Interest and Prices, 1936.

Under barter a rate of exchange would emerge "...which would be determined by supply and demand if no use were made of money, and all lending were effected in the form of real capital goods",(1) and this rate Wicksell named the "Natural" Rate of Interest. If money is introduced, there will be a money rate which corresponds(2) to the Natural Rate, and this he names the "Normal" Rate. This rate, he says,

> is neutral with respect to commodity prices and tends neither to raise nor lower them. This is necessarily the same rate which would be determined by Supply and Demand if no use were made of money.(3)

The significance of drawing a distinction between borrowing under barter, and borrowing under money lies in the fact that while under the former the supply of loanable real assets is limited, under the latter the supply of money loans is theoretically unlimited.

> A lender cannot provide more goods than he actually possesses, but he can provide any amount of money, - in fact he provides exactly the sum the borrower promises to pay for the goods.(4)

Under barter conditions, the sacrifice of postponing consumption on the one hand, and the yield expected from using the commodity in production on the other, between them determined a rate of exchange which reflected the relative significance of consumption now, and consumption in the future. But under a system of money, in which the medium of exchange is itself expansible and contractible, a money rate of interest may emerge which does not correspond to consumers' time preferences. The amounts of unspent money income which savers make available for investment may be augmented by the proceeds of credit expansion, i.e. the supply of money capital diverges from the current flow of savings, as a result of the banks' decision to expand credit. This point has been well expressed by B.W. Dempsey,

> Banking policy allows circulating credit, (that which at the time of the loan imposes no sacrifice on the lenders) to run a course notably different from what would have been the conduct of commodity credit, in which the gain of the borrower is balanced by a simultaneous sacrifice on the part of the lender.(5)

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1. Ibid, p. 102.

2. Although the natural and normal rates need not be equal due to the increase in lending efficiency through having a monetary medium, there will be a uniform ratio between them.

3. Ibid, p. 102.

4. Ibid, p. xxvii n.

5. B. W. Dempsey, Interest and Usury, Dobson, 1948, p.48.

If a money rate of interest for loans is charged, which does not correspond to the Natural rate, i.e. a rate other than the Normal, the change in the total amount of money which results will induce a cumulative change in the general level of prices, which Wicksell compared with "...a cylinder on a smooth surface, having no tendency to roll but (which) if moved, will roll indefinitely."(1) But while Wicksell was primarily interested in the changes in the general price level following a fall in the money rate of interest below the Natural or Normal rate, Hayek concentrates attention on the resulting change in relative prices.(2) Relative prices change because the additional money does not affect all prices simultaneously; and here, in the expansibility of credit, Hayek discovers the factor which is capable of "... dissolving those rigid interrelationships of equilibrium"(3), so that a "range of indeterminateness appears within which movements can originate leading away from equilibrium."(4)

Using Wicksell's concept of the origin of monetary disequilibrium, and its later refinement by Von Mises, as a point of departure, Hayek develops an explanation of the trade cycle based largely on Bohm. Bawerk's theory of capital and interest. This theory interprets capitalistic production as being dependent on the supply of "waiting", economic progress involving an increase in the amount of capital per unit of output, i.e. an increase in the supply of "waiting", enabling methods of production to be become more 'roundabout'. An increase in the amount of capital used in the production of each unit of output is interpreted as necessarily involving an increase in the period of time elapsing between the 'input' of production factors, and the subsequent emergence of final output. Hayek proceeds to explain the Trade Cycle in terms of divergencies

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1. Unlike a change in relative prices which tends to equilibrium after displacement "like a ball on the bottom of a bowl". Wicksell, Lectures on Political Economy, Robbin's Edition, 1934, Vol. II, p.196.

2. "We are in no way concerned to explain the effect of the monetary factor on trade fluctuations through changes, in the value of money and variations in the price level." Hayek, Monetary Theory and the Trade Cycle, 1929 (trans. 1933), Cape, p. 103.

3. Ibid, p. 90.

4. Ibid, p. 86

of the market rate of interest from the Natural or Normal level, which cause temporary alternate lengthenings and contractions of the structure of production that are "the real phenomena which constitute it."(1)

III

Turning now to a more detailed account of his theory as described in his two earlier works, we find that for purposes of analysis he assumes(2) an initial position of equilibrium in which,

(a) there is no unemployment,

(b) the ratio between the amount of money spent on consumers' goods and the amount spent on producers' goods equals the ratio between the total demand for consumers' goods and the total demand for intermediate goods and

(c) these ratios equal the ratio between the output of consumers' goods, and the output of intermediate goods per unit of time.(3)

i.e. he assumes an identity between real and money supply with the full employment of resources.(4)

He further supposes(5) that production is organised into a series of equal and separate stages, the "earliest" stages being those for which the interval between the application of original factors and the completion of the finished product is longest, the latest stages being those for which the interval is shortest, i.e. early stages are further from, and later stages are nearer to, actual consumption.

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1. Hayek, Prices and Production, Routledge, 1935, p. xiii n.

2. Hayek, Prices and Production, p.46.

3. He defines these terms as follows:
(a) Original Means of Production = Land and Labour.
(b) Factors of Production = Land Labour and Capital.
(c) Producers' Goods = All goods, including factors of production and materials in process, which are used for the production of consumers' goods,
(d) Intermediate Goods = All producers' goods other than Land and Labour.

4. c.f. Dempsey, Interest and Usury, p.52.

5. Hayek, Op. cit, P. 43-46.

A fall in the rate of interest, due either to an increase in the amount of savings or to a lowering of the market rate below the Equilibrium Rate[1] will induce entrepreneurs to "lengthen" the period of production by adopting more 'roundabout' methods, "the raison d'être... is that, (at the lower rate of interest) by lengthening the production process we are able to obtain a greater quantity of consumers' goods from a given quantity of original means of production."[2]

This involves an increase in the 'earlier' stages and the transfer of factors of production from the later stages. The proportion of the total supply of factors which are applied to the production of consumers' goods is reduced, and the proportion applied to the production of intermediate products is increased. Entrepreneurs are able to reallocate the factors in this way because, following the increase in the supply of savings, or of bank credit, they have increased money resources at their disposal with which to bid for the available supply of labour etc., while the assumption of full employment excludes the possibility of simultaneously expanding both early and late stages. Whether these structural changes will be relatively permanent or not depends, Hayek suggests, on whether the fall in the rate of interest was the result of an increase in savings, or of a unilateral increase in the supply of bank credit, i.e. whether the Equilibrium Rate itself was lowered, or whether the market rate was lowered <u>below</u> the Equilibrium Rate.

If there had been a fall in the Equilibrium Rate due to an increase in saving, the demand for the current output of consumers' goods would also fall. The resources released from their production could then be used to "lengthen" the productive process in such a way that "... the output of consumers' goods may be sold for the reduced sum... available for that purpose,"[3] and equilibrium would be re-established as soon

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1. "Equilibrium Rate" corresponds to Wicksell's "Normal Rate, - that at which the Demand for, and the Supply of, Savings are equal.

2. <u>Ibid</u>, pp. 37-38.

3. Hayek, <u>Prices and Production</u>, p. 51.

as the organisation of production reflected the new time-preference of consumers. There is no reason to suppose that the change in consumers' habits would be short-lived, particularly in view of the fact that "... after the change had been completed (savers) would get a greater proportion of the increased total real income."(1) Therefore there should be a long enough period to enable the redistribution of resources to become completely adjusted to the new distribution of income, and the new methods of production.

On the other hand, if the market rate is set below the equilibrium level, and there is no change in the rate of saving, entrepreneurs can in the same way increase their demand for producers' goods. But, there having been no change in the spending habits of consumers, the level of the demand for consumers' goods will not fall. Assuming full employment, there must then be a reduction in the output of consumers goods, but as the same amount of income is being spent on them, they will rise in price. Consumers therefore have to accept a smaller quantity of goods in exchange for the same money outlay, in order to allow the relative expansion of the earlier stages to take place. This process Hayek calls "Forced Saving."(2)

Later however, consumers' find their money incomes increased after the expenditure of the credit by the entrepreneurs, and he suggests that in view of this they will attempt to make up for the past "unforseen retrenchment of their real income", by now spending a larger proportion of their incomes on consumers' goods.(3) The time will come when the

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1. Ibid, p. 57.

2. (a) Hayek suggests that the principle of "forced saving" originated with Bentham's, Manual of Political Economy, in which he speaks of "forced frugality"

(b) D. H. Robertson favours the phrase "automatic stinting" to describe the case in which "... an increase in the stream of money directed onto the market prevents certain persons from consuming goods which they otherwise would have consumed." Banking Policy and the Price Level, King, 1926, p. 47-8.

3. Hayek, Prices and Production, p. 57.

exhaustion of bank reserves necessitates a raising of the rate of interest, and discourages entrepreneurs from borrowing as much as before. Together, the rise in the demand for consumers' goods, and the fall in the rate of expenditure on producers' goods involve a change in the distribution of total money outlay. The structure of production now no longer faithfully reflects consumers' preferences, and attempts are made to achieve alignment by "shortening" the structure, i.e. expanding those stages nearer to consumption. This re-adjustment inevitably involves a loss of value on the part of those resources which are specific to the earlier stages and brings the economy to the brink of depression,

> This contraction which naturally involves the loss of those means of production which are adapted to the longer processes... is a typical phenomenon of any crisis.(1)

Thus the value of specific resources falls, and those factors which are released from the earlier stages, but which fail to be absorbed readily into the later stages, suffer a loss of income; and Investment is further discouraged due to the uncertainty of entrepreneurs regarding the ultimate structure of production that it will be profitable to establish. Out of the crisis develops a period of unemployment and depression.

To assist in the explanation of these structural changes which occur periodically under a system of capitalistic production, Hayek invokes an ingenious relationship between changes in the rate of interest, and the changes which take place in the relative values of different goods, used at different stages in the process of production. He states that there will be a difference between the value of a unit of output from one stage of production and the value of the unit of output at the succeeding stage,(2) - and this difference he calls a "price margin". Thus for any stage, the selling price of its output exceeds the value of the input of raw materials, labour, etc., by an amount which constitutes the source of interest whilst, "in a state of equilibrium, these margins

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1. Hayek "Paradox of Saving", reprinted from Economica, 1931 in Profits Interest and Investment, p. 262.

2. Hayek, Prices and Production, p. 73.

are entirely absorbed by interest."[1] [2] This would seem to follow from Hayek's particular interpretation of economic equilibrium as depending on a certain relationship between the prices of producers' goods and the prices of consumers' goods, a relationship which will be solely determined by the preference of consumers as between saving and spending,

> Every given structure of production, i.e. every given allocation of goods as between different branches of production requires a certain definite relationship between the prices of the finished products and those of the means of production. In a state of equilibrium, the difference necessarily existing between these two sets of prices must correspond to the rate of interest....[3]

Under barter conditions, the rate of interest, and thus these price relationships, will be unlikely to diverge from their equilibrium values since "... the reciprocal gains and sacrifices of saving borrowing and lending are concretely juxtaposed and deviations from an equilibrium position are more obviously and more directly carry their penalties with them."[4] Likewise in a money economy, in which the supply of credit is kept equal to the supply of savings, there will tend to be a close correspondence between changes in price margins and in the rate of interest.

An increase in the rate of saving which lowers the equilibrium rate of interest will, Hayek suggests, involve a corresponding shrinkage of the price margins. This is because greater saving leads both to a reduction in the demand for consumers' goods which reduces their prices, and the prices of the goods at the stages immediately preceding; and also to a rise in the demand for, and in the price of, products at the earlier stages, and the latter change is transmitted towards the later

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1. Ibid, p. 73. (Italics not in original)

2. But only in the case of productive processes, which are time-using only, involving no payments for wages, rent etc., will the difference between input cost and selling price be entirely absorbed by interest. The rate of interest will then be that which equates the present value of a good at a certain stage, with the value of the good at a subsequent stage, and after a given lapse of time.

3. Hayek, Monetary Theory and the Trade Cycle, p. 212.

4. Dempsey, Interest and Usury, p. 54.

stages, (but with diminishing intensity), until the price margins are again all equal, and equivalent to a lower rate of interest.(1)

The transfer of resources between the stages, which accompanies the change in relative prices is also explained in terms of interest. The value of factors of production will vary according to the length of time which elapses before their product is completed, since the longer the interval, the greater the amount by which a factor's product must be discounted in order that the present values of the marginal products of the same factor used at different stages should all be equal. A fall in the rate of interest will raise the value of marginal products at all stages (except the last), but the increase will be the greatest at the stage furthest in time from consumption.(2) There will therefore be a relative increase in the demand for factors for use in the earlier stages. This induces their movement away from the later stages, "... until the value of the physical marginal product of every unit of labour is again equal to the value of that unit plus interest, for the period for which it has been invested"(3). The re-allocation of resources according to the revised preferences of consumers thus increases the average interval of time between input and output, and adjusts the values of goods and services at different stages until once again the price margins exactly equal the claim of savers for interest payments. The complete redistribution of resources is possible on the assumption that, for reasons outlined above,(4) furter immediate changes in the

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1. Although Hayek argues that price margins and interest payments coincide in equilibrium, it"does not prove that the same will also be true in a period of transition from one state of equilibrium to another." Prices and Production, p. 74.

2. "To what extent, and in what proportion the prices of different factors will be affected by a given change in the rate of interest will depend on the stages in which they can be used (their specificity) and on the shape of their marginal productivity curves in these stages." Ibid, p. 82.

3. Ibid, p. 2.

4. Vide supra p. 37.

goods will rise relatively to the price of intermediate goods, and improve the competitive position of the producers of the former for the supply of factors. Versatile resources will be attracted to the 'later' stages at which the price margins have become wider, while the earlier stages will "tend to become unprofitable until unemployment finally arises and leads to a fall in the prices of the original factors of production as well as in the prices of consumers' goods."(1)

Only if credit could be made available at a continually increasing rate,(2) would it be profitable to make those further investments which are still needed to complete the planned development of the earlier stages. But unfortunately the banks are unable to maintain the supply of credit in this way, due to the rapid exhaustion of their cash reserves. Borrowing has to be discouraged and the market rate is raised. This leads to the abandonment of those half-finished extensions to the capital equipment of industry which were planned in the light of the initial low market rate, since at the higher rate, and the new distribution of total money demand which that reflects, their completion becomes unprofitable, at least in comparison with the development of those stages nearer to consumption. Thus the origin of the boom, and in a sense the crisis itself, is traced to the failure of interest to act as a "sufficient regulator for the proportional development of the production of capital goods and consumers' goods."(3)

While the use of interest to explain the cause of the trade cycle in terms of the effects of a temporary credit inflation has been widely accepted in principle, Hayek's particular development of this general approach has lead to a certain amount of criticism. In particular, doubts have been raised about this "price margin" theory of interest, and about the significance of the rise in the market rate of interest as a factor bringing the boom to an end in just the way he suggests.

We recall that Hayek, by identifying the "price margins" between the different stages of production with the rate of interest sought to explain the change in the price levels of different goods. The fall in

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1. Hayek, Prices and Production, p. 148.

2. Ibid, p. 150

3. Hayek, Monetary Theory and the Trade Cycle, p. 203.

the market rate of interest was supposed itself to induce changes in relative prices such that when equilibrium was re-established the price margins, having fallen pari passu with the rate, would again correspond to the lower rate. The price margins themselves apparently represent therefore both the increment of value contributed by the factor capital, and also the extent of the claim of lenders on the proceeds of sale of the product.

However it may reasonably be doubted whether, even for the purpose of analysis, this assumption of a direct connection between these price margins and interest is justifiable. It is felt that the term "price margin" ought to refer only to the margin between total unit cost and selling price, the former to include interest and all other contractual costs of production. The price margin would then vary directly with any changes in contractual costs and/or selling prices, and would thus represent the return, positive or negative, to that factor of production which in the nature of things cannot be hired contractually, i.e. the return to risk-bearing or entrepreneurship, and could more appropriately be named a "profit margin." Interest, on the other hand, is a contractual cost which can largely be ascertained before investment is initiated, and is a cost which does not necessarily vary with changes in relative prices. Interest is the return for "waiting", for postponing consumption, and as such exerts a claim on the proceeds of sale quite independently of changes in selling prices, or in the profit margin.

Since therefore, it is profit and not interest which is a function of relative price levels there seems little justification for including, as Hayek seems to do, profit in total cost while excluding interest, merely so that the latter may be identified with a price margin.(1) This confusion between the function of interest and profit is most obvious in his attempt to rationalise his construction by arguing,

> that margins of this kind must exist is obvious from the consideration that, if it were not so, there would exist no inducement to risk money by investing it in production.(2)

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1. c.f. Haytrey, Capital and Employment, p. 240-2.

2. Hayek, Prices and Production, p.p. 73 - 74 (italics not in original)

It may be said in mitigation that Hayek perhaps intended that profits should be excluded altogether when considering conditions of equilibrium, on the grounds that he implied in "Prices and Production", what he later explicitly assumed were the necessary conditions for a concept of economic equilibrium, i.e.

> that everybody forsees the future correctly, and that this foresight includes not only the changes in the objective date, but also the behaviour of all the other people with whom (the entrepreneur) expects to perform economic transactions.(1)

Under these assumptions, profits and losses (and profit margins) would only arise during periods of transition from one state of equilibrium to another. Hayek himself later realised that an explanation of the dynamic conditions of the trade cycle, which over emphasises interest to the virtual exclusion of profits, cannot adequately account for the investment decisions of entrepreneurs, which in themselves are in a sense both the cause, and the result of, the cyclical process.(2)

Keynes has gone so far as to suggest that this preoccupation with interest has resulted in "...Professor Mises and his disciples (getting) their conclusions exactly the wrong way round!"(3) Hayek's view that a relative fall in the demand for consumers' goods, is nevertheless favourable to investment, is shown to depend on his questionable assumption that entrepreneurs base their decisions on the rate of interest, rather than on changes in the level of final demand. This in turn depends on the identification of changes in the rate of interest with changes in the relative prices of producers' goods and consumers' goods. These assumptions are in complete contrast to the Keynesian construction in which the rate of interest (at least in the short period) is divorced from the demand for, and the return on "real" investment. The rate is here determined

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1. Hayek, "Price Expectations, Monetary Disturbances, and Malinvestments," 1933, reprinted in Profits Interest and Investment, p. 139.

2. Cf. Profits Interest and Investment, 1939, p. 3.

3. J. M. Keynes, General Theory of Employment, Interest and Money, Macmillan, 1936, p.p. 192-3.

solely by the demand for, and supply of money, and reflects the preferences of savers as between holding their savings in cash or in some form of security or debt.(1) The demand for "real" investment is seen as a function of the marginal efficiency of capital (its "psychological productivity") while the latter is not so much a function of the rate of interest as of the demand for the output of consumers' goods. Interest merely acts as a selective device, limiting investment to those projects whose marginal efficiency exceeds the current rate of interest. Investment is seen therefore as being encouraged either by a rise in the marginal efficiency of capital, or by a fall in the rate of interest,(2) and so in contrast to Hayek's assumption, an increase in saving which necessarily involves a fall in the demand for consumers' goods, will discourage investment because it lowers the marginal efficiency of capital.

Thus we may suppose Hayek and Keynes to be working on assumptions relevant to two extreme cases, i.e. in which interest is either completely identified with relative price changes, or completely divorced from relative price changes, in the short run. While we may feel that Keynes' assumptions in the context of the trade cycle are the more realistic, and are more helpful in understanding fluctuations in investment, we cannot agree that Keynes' has demonstrated convincingly that Hayek's assumptions have lead him to conclusions which are necessarily the "wrong way round." We would agree however that his assumptions based on the "classical" theory of interest, while admirable for explaining long run changes,(3) are much less helpful as an aid to our understanding of a "concrete set of disequilibrium conditions."

We have seen that for Hayek, the boom comes to an end because of the failure of credit to expand at a rate sufficient to maintain the time-lag between rising prices, and rising wages and costs, which results in a return of demand towards its previous distribution between consumption

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1. Ibid, p. 167.

2. "As the stock of assets, which begin by having a marginal efficiency at least equal to the rate of interest, is increased their marginal efficiency... 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..." Ibid, p. 228.

3. Keynes does admit the applicability of Hayek's assumptions to long period analysis in a footnote, General Theory, p. 192.

and saving. The minimum rate of credit increase, which will still allow the new structure to be completed, depends on the time-lag between the moment when the new credit is spent by entrepreneurs, and the moment when it is spent out of income on consumers' goods. Hayek stresses that it is not necessary for there to be a fall in the amount of outstanding credit, but merely that its failure to increase should be sufficient to allow the market rate, "...to rise again to its natural level and thus render unprofitable, (temporarily at least) those investments which were created with the aid of additional credit."(1)

> This phenomenon of a scarcity of (money) capital making it impossible to use the existing capital equipment appears to me the central point of the true explanation of crises.(2)

D. H. Robertson considers that the abandonment of half completed projects, which causes a "recession in the demand for instrumental goods (and) is the feature of the crisis emphasized... by continental theorists,"(3) exaggerates the importance of the rise in the rate of interest in the later stages of the boom. He argues that the rise in the rate will affect neither those investments financed from windfall profits, nor those based on long-term loan contracts at the previous lower rates. The influence of the higher rate ought rather to be confined to explaining the new investment plans which are now discarded, but which would have materialised had the rate not risen.(4)

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1. Hayek, Monetary Theory and the Trade Cycle, p. 176.

2. Hayek, "Price Expectations" in Profits Interest and Investment, p. 149.

3. Robertson, "Industrial Fluctuations and the Natural Rate of Interest", Economic Journal, 1934, p. 653.

4. Robertson's more fundamental explanation of the depression is as follows:- "Owing to saturation with existing instruments whose marginal productivity has fallen very low, the curve of marginal productivity of new lendings will be violently displaced downwards... and thus the natural rate falls below the money rate, and so long as the actual rate is kept above this, there will be an excess in the rate of available savings per atom of time over the rate of industrial borrowings, showing itself in a progressive immobilisation of savings in the form of bank deposits. The Cunarder suspended on the plea of high interest rates remains suspended with Bank Rate at 2% because there are too many ships." Ibid, p. 653.

Jack Stafford shares Robertson's scepticism regarding the possibility of a rise in the interest rate itself being sufficient to bring the boom to an end, by inducing the wholesale abandonment of half completed projects....

> When interest rates more upwards once more, long-term loans will still carry the favourable rate, and short-term loans only can be affected immediately. Other things being equal, a process of production that was profitable with a 2% interest rate during the boom will remain profitable at that interest rate under more normal conditions. Thus the only consequence that one ought to expect appears to be a redirection in the investment of obsolescence allowances.... It is of course possible that higher charges on short-term loans will render 'long' processes unprofitable. But this is unlikely... In any event higher charges on borrowings for short-term will not generally be sufficient incentive to jeopardize the productive possibilities of a plant in which large amounts of capital are inevitably tied. They only provide an added reason for redirecting investment as that becomes possible."(1)

Hawtrey on the other hand fails to see why the rate of interest need be raised at all, since he can see no reason why at the higher money incomes and profits which accompany the inflation, savings should not increase sufficiently to allow for the completion and maintenance of the elongated structure. And in any case, "so long as the amount of savings, even though diminished, exceeds what the widening process requires, there will be no shortening of the period of production...."(2)

In a subsequent essay,(3) Hayek modifies considerably his earlier views on the reaction of investment demand to the raising of the rate during the latter part of the boom, bringing them more into line with the suggestions made by his critics. Thus he now argues that investments are usually made in the expectation that the other links in the chain of complementary investment will be forthcoming. Once an initial investment outlay has become specific, a subsequent rise in the rate of interest ought not to deter investors from completing the chain. This follows from the fact that losses on the initial investment can be minimised if,

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1. J. Stafford, "The Equilibrium Rate of Interest", Econ. Journal June 1935, p. 267.

2. Hawtrey, Capital and Employment, p. 253.

3. Hayek, Investment that Raises the Demand for Capital, Review of Economic Statistics Vo. xix, No. 4, Nov. 1937. Reprinted in Profits Interest and Investment, p. 73.

by being operated, the capital equipment can earn enough to more than cover its prime costs. To make possible this economy, output will be offered for sale at prices below average total cost, so providing "...a premium on investment in the later stages of the process" in the sense that part of the input of the subsequent units in the process, can now be acquired at lower cost. The greater the proportion of total planned investment that has already been completed the higher will be the rate of interest that can "advantageously be borne in raising capital for those investments completing the chain."(1) Hayek concludes that in view of these considerations, a rise in the rate of interest will deter only that part of borrowing for which the funds raised were intended for beginning new "chains", while, ".... for the rest, the demand for capital will be highly inelastic with respect to changes in the rate of interest."(2)

It may be suggested at this point that much of the controversy which followed the publication of Hayek's earlier work on the theory of the trade cycle would have been avaided had he distinguished clearly in his arguments between changes in the short-term rate as determined by banking policy, and the related changes in the long-term investment market. Although he gives no clear indication of his views regarding their interdependence, he seems to imply that the connection between the two markets is much closer than Hawtrey believes it to be, and that the relative sensitivity of different types of investment demand to changes in the short-term and long-term rates is not, in this context, an important consideration. He explains the over-investment of the boom as being due to the progressive increase in bank loans, but he does not explain whether the investment is financed by short-term or long-term borrowing. Must we then assume that entrepreneurs "borrow short and invest long "in order to account for the alleged disastrous effects of

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1. Ibid, p. 76.
2. Ibid, p. 77.

the slowing down of credit expansion ? For a theory which attempts to account for industrial fluctuations in terms of changes in the methods of production arising from variations in the amount of capital used per unit of output, it would seem indispensible to make a clear distinction between additions to fixed, and additions to working capital and between short-term and long-term methods of financing.

But while these critics accept by implication Hayek's thesis that the boom is characterised by a 'lengthening' of the process of production, i.e. an increase of the amount of capital used per unit of output, Kaldor has attacked its very foundation by attempting to show that, in fact, the boom involves the adoption of less capitalistic methods of production.(1) He follows Keynes by suggesting that Hayek's conclusions are the "wrong way round", but as we shall see, for rather different reasons.

Kaldor argues that there are in fact not one, but two, determinants of capital intensity; both the rate of interest and the relationship between costs and selling prices, i.e. real wages. A fall in real wages will, ceteris paribus, like a rise in the rate of interest, result in a 'shortening' of the period of production i.e. a reduction in capital intensity.(2) Which will exert the stronger influence on the degree of capital intensity adopted, will depend on the relative elasticities of the curve of the marginal supply of investible funds and the curve of the marginal efficiency of capital,

> If the marginal supply curve of capital is elastic relatively to the marginal efficiency curves, the influence of the rate of interest will be dominant, and vice versa. This is merely another way of saying that the answer to our question depends on the nature of the forces which limit the scale of investment of the representative firm... if it is limited chiefly by the scarcity of funds at its disposal, the main influence will be the level of prices relatively to wages.(3)

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1. N. Kaldor, Capital Intensity and the Trade Cycle, Economica, Feb., 1939, p. 40.

2. Kaldor prefers the ratio of initial cost to annual cost as an index of the degree of 'roundaboutness' of production, because it avoids the controversy which has raged over the validity of the period of production analysis of capital. Ibid, p. 41-3.

3. Ibid, p. 51 (Italics not in original).

At first sight Kaldor's broadside may appear to have completely demolished the very foundation of the Hayekian analysis. But on closer inspection it becomes evident that it has done nothing of the sort. His account of the effects of the fall in real wages; the growing scarcity of labour[1] as the economy approaches a condition of full-employment; the rise in the rate of interest; and the development of excess capacity[2] in no way accounts for the boom itself, but explains rather why the boom must come to an end ! It cannot continue because under these conditions there is insufficient stimulus for the continued "deepening" of capital, so that the demand for capital goods falls. This is not very different from Hayek's explanation of the crisis as being due to the increase in the demand for consumers' goods, which leads to the abandonment of more capitalistic methods and the painful readjustment which that entails. Undaunted, Hayek later reaffirmed his conviction that,

> the transition to more capitalistic methods of production takes place during periods of low interest rates and brings about the boom, and that the transition to less capitalistic methods of production is caused by high rates of interest and brings about the depression.[3]

Commenting on Kaldor's article Hayek proposed that "this is.... practically identical with (Kaldor's own "new" theory on this point." [4] [5]

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1. Ibid, p. 58.

2. Excess capacity develops in the consumers' goods industries due to the failure of demand to "increase pari passu with the capacity to produce consumers' goods." Ibid, p. 57.

3. Hayek, Profits Interest and Investment, p. 38-39 note.

4. Ibid, p. 39 note.

5. Hawtrey also makes a case for reconciling the two theories on the grounds that Hayek "...picks up the story at the moment when the scarcity of labour which forms Mr. Kaldor's climax is already imminent. He does, it is true, leave out of account the possible dislocation arising from an excessive and transitory stimulus to widening. But he and Mr. Kaldor agree in supposing that when full employment is reached, the system will suffer from an excessive amount of resources being made available for the 'deepening' process. In Mr. Kaldor's view it is the failure of deepening to respond to the offer of resources that is the cause of trouble, whereas Prof. Hayek assumes that it does respond and is then bound to fall off again." See Hawtrey's Comment on Kaldor's article in Economica 1940.

But Kaldor's analysis is nevertheless significant in that it brought attention to the need for introducing into the "Austrian" approach a proper regard for the influence of the changing level of profits as a factor modifying the sequence of events previously based on interest alone. We now turn to a discussion of Hayek's most recent analysis of the boom and crisis in which he attempts "... to show the same tendencies at work under different... and more realistic assumptions."(1)

IV

Hayek claims for his revised version of his theory that it presents "essentially the same argument" as did "Monetary Theory and the Trade Cycle", and "Prices and Production", and although they have in common the insistence that the boom is brought to an end by over-consumption, his new version differs basically in that interest rates are assumed to remain unchanged throughout the boom.(2) This assumption is made specifically to demonstrate that the structural changes in the process of production, previously explained exclusively in terms of interest, may be explained by changes in the rate of profit, independently of the rate of interest. In brief, this theme is developed as follows:

In the latter stages of depression, profit rates are depressed by the fall in prices, and the consequent rise in real wages. Producers are therefore induced to make investments of a cost-saving nature, encouraged by the prevailing low rates of interest. Additional orders beyond the requirements for maintenance and replacement are placed with the capital goods industries, stimulating output, and increasing employment and money incomes. This causes a subsequent rise in the demand for consumers' goods. Consumption goods industries therefore increase their outlay on capital to meet the higher level of demand, and activity in the capital goods industries is further stimulated.

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1. Hayek, Profits Interest and Investment, p. 5.

2. The other assumptions on which the theory is based are:-
(a) Initial unemployment of resources.
(b) Limited mobility of labour between the main industrial groups.
(c) The existing rigidity of money wages.
(d) Specificity of capital equipment.

see Profits Interest and Investment, p.p. 5-6.

> It is in this phase of the revival, before prices and profits begin to rise that the Acceleration Principle operates with a constant (and very high) multiplier, that every (actual or expected) increase in the demand for consumers' goods will lead to a demand for a very great quantity of capital goods, and that employment will grow rapidly in the investment goods industries.(1)

In other words the level of investment demand will be determined by the amount of capital per unit of planned output, multiplied by the expected increase in demand; and will be high because conditions are favourable for the adoption of more capitalistic methods. This is significant in that each increment of investment outlay creates an addition to total money incomes far in excess if its addition to the current supply of consumable goods and services.

Unless savings increase pari passu with the rise in the level of money incomes, the demand for consumers' goods will expand, and as supplies are not forthcoming at the same rate as income is being generated, their prices will tend to rise, particularly if, with the decrease in unemployment, the supply of factors is becoming less elastic. On the assumption that money wages are 'sticky', the rise in prices causes a rise in profits and a fall in real wages, as the boom gets under way. This will have the effect, Hayek suggests, of reversing the earlier preference for more capitalistic methods, in favour of "more direct" methods.

To explain these changes in the character of investment he invokes a "substitution-of-labour-for-capital" mechanism, which he names the "Ricardo Effect".(2) This substitution arises because, although a rise in prices of (say) 5% results in an equal increase in the amount of profit from each turnover of capital, the increase in the profit per unit of time will be greatest for those investments with the highest rate of turnover,

> if the difference between the price of a unit of input, and the price of a unit of output increases, a smaller marginal product, maturing at a nearer date may well represent a higher time rate of profit...(3)

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1. Ibid, p. 41.
2. Ibid, p. 10.
3. Hayek, Pure Theory of Capital, Macmillan, 1941, p. 384.

Therefore, as prices rise and real wages fall during the boom, entrepreneurs will attempt to maximise profits by substituting, wherever possible, investments with a higher rate of turnover for investments with a lower rate of turnover. This will show itself as a demand for less durable, less labour-saving equipment in preference to more durable, more automatic equipment, i.e. a preference for methods employing labour "more directly", a preference for "less roundabout" methods. At some point during the boom the capital intensity of new investment will thus begin to fall, due to the rise in prices in the consumers' goods industries, and the fall in real wages. Hayek therefore claims that the "...rise in the rate of profit in the industries near consumption, will in the end act in a way very similar to that in which the rise in the rate of interest is supposed to act."(1)

The amount of capital invested per unit of planned output falls continuously as the rate of profit rises, until ultimately the reduction becomes proportionately greater than the expected increase in consumer demand,

> the tendency to change to less durable and expensive types of machinery (becomes) dominant over the tendency to provide capacity for a larger output. Or in other words, in the end, the "acceleration principle of derived demand "becomes inverted into a "deceleration principle".(2)

i.e. the fall in the Multiplier becomes proportionately greater than the increase in the Multiplicand, and ultimately involves a net reduction in total demand for investment goods of all types. Labour becomes unemployed in the capital goods industries, and total incomes fall, bringing a fall in the demand for consumers' goods as well. Profits shrink as prices fall, and the real wages of those still employed increase, adding to the deflationary pressure.

Depressed conditions continue until with the higher level of real wages, investment in cost-saving equipment is again stimulated, and the economy revives. Hayek emphasises that it is the fall in the profit rate,

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1. Profits, Interest and Investment, p. 64.

2. Ibid, p. 33.

consequent upon the rise in real wages, "... rather than the fall in the rate of interest, which in the end stimulates the introduction of more labour-saving machinery etc., and thus revives investment."(1)

However, should the profit rate be allowed to fall too far, this will induce investments which are too capitalistic for permanent stability. Thus the seeds of future disequilibrium may be sown during the latter stages of the depression since it is "... the form that investment takes right from the beginning of the recovery which decides how far the expansion may be carried without making an ultimate breakdown inevitable."(2) /

Hayek warns us that this theory is not intended primarily to be a faithful account of the course of the cycle, but is designed rather to throw into relief those forces which, in the absence of stabilising movements in the rate of interest, will both limit the boom, and prevent indefinite depression. The construction of this theory contrasts with his earlier analysis in which entrepreneurs' decisions were the result of changes in the rate of interest,(3) and in which interest was directly related to investment via the "price margins." It was assumed there that even in the short run, interest did perform the function attributed to it in classical theory, that of equating saving and investment. Only when credit expansion caused a divergence of the money rate from the 'natural' rate was disequilibrium possible.(4) In introducing his later essay, Hayek states that he no longer believes that changes in the relative demand for producers' goods, and consumers' goods comes about directly via changes in the rate of interest, but rather as a result of changes in the

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1. Ibid, p. 65.

2. Ibid, p. 61.

3. "... there is one medium through which the expected ultimate effect on relative prices should make itself felt immediately... the rate of interest on the loan market..." Prices and Production, p. 84,

4. Even the disequilibrium of a large change in savings was regarded as a non-monetary fluctuation "... a particularly complicated case of the direct process of adjustment to changes in data." Hayek, Monetary Theory and the Trade Cycle, p. 206.

rate of profit..." it seems that the idea that investment is guided by the rate of interest is to a large extent an ideal rather than a fact."[1] Neither does he hold that there is any necessary correspondence, in the short run, between movements in the rate of profit and movements in the rate of interest. The former is "... distinct from, and may move independently of the money rate"[2] although in the long run interest does "... ultimately follow the movements of the rate of profit."[3][4]

However, Hayek does retain his confidence in the rate of interest as an instrument for attaining, and maintaining, economic stability,[5] and like Hawtrey[6] the appropriate guide to interest rate policy is believed to be the rate of profits, or more particularly, the rate of profits in the consumers' goods industries. After revival, when profits in the later stages of production tend to increase with the rise in prices, the rate of interest should also rise, and by keeping in step, absorb these profits. By doing so, Hayek claims that the excessive reversion to less capitalistic methods, which brings the boom to an end may be avoided, provided only that the rate is adjusted promptly.

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1. Hayek, Profits Interest and Investment, p. 68.

2. Ibid, p. 3.

3. Ibid, p. 65.

4. Hayek illustrates how a change in liquidity preference may cause a divergence of interest from the marginal rates of profit on real investment. "If, for instance, a spontaneous change in liquidity preference leads to a shifting of funds from real investment to the holding of gilt-edged securities, the fall in interest rates proper may be accompanied by a rise in the marginal rates of profit and will indicate that real investment is being curtailed. Similarly a rise in money rates of interest may be accompanied by a fall in marginal rates of profit, and may be merely a symptom of the fact that real investment is now regarded as relatively more attractive, with the result not only that no real investment, which was formerly profitable, will become unprofitable on account of the rise in the rate of interest, but that some new real investments will now be undertaken, which were not undertaken at the lower rate of interest." Pure Theory of Capital, Chap. XXVIII, p.p. 405-6.

5. Profits Interest and Investment, p. 68.

6. Vide supra, p. 27-8.

> We must not forget that the rise (and similarly the fall) of the rate of profit only becomes so big as it actually does because, failing a parallel movement of the rate of interest, a rise of profits, will for a considerable period further stimulate investment of all kinds. And while, once this progress has gone some distance, the rise in the rate of interest required to check it might indeed be very considerable, a prompt adjustment of the rate of interest as soon as profits begin to rise (or fall), although not involving a great change, might well be effective.(1)

While Keynes believes that boom conditions can be maintained by keeping the rate of interest from rising, and so maintaining a high level of investment,(2) Hayek would consider that at best this policy can only temporarily perpetuate a level of investment, which is itself inherently unstable. The further the rate of profit is allowed to rise, the greater must be the eventual decline in investment, and the deeper the depression which follows.

But while Hayek's new approach to the part played by the rate of interest in the origin and development of cyclical fluctuations brings with it a welcome touch of realism, critics have been by no means eager to embrace his revised version in its entirety. Wilson(3) has commented that the assumption, that real wages fall during the upswing, is far from being ".... probably one of the best established empirical generalisations about industrial fluctuations" as Hayek asserts,(4) particularly in view of the results of recent statistical investigations.(5) He has also criticised the numerical examples(6) with which Hayek sought to illustrate the effect of falling real wages and rising prices on the profitability of different types of investments. This on the grounds that entrepreneurs are seldom faced with the choice of investing for six

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1. Ibid, p. 68.

2. "Thus the remedy for the boom is not a higher rate of interest, but a lower rate of interest. For that may enable the so-called boom to last." General Theory of Employment, p. 322.

3. T. Wilson, "Capital Theory and Trade Cycle", Review of Economic Studies, 1940, p. 171.

4. Hayek, Op. cit. p. 11.

5. See G. T. Dunlop, "Movement of Real and Money Wage Rates", Economic Journal, Sept. 1938, and "Real and Money Wage Rates", Quarterly Journal of Economics, August, 1941.
L. Tarshis, "Changes in Real and Money Wages", Economic Journal, 1939, "Real and Money Wage Rates", Quarterly Journal of Economics, Nov.1940.

6. Hayek, Op. cit. p. 9.

months, or two years, (as in the example) and are more likely to have to decide between three, four, or five years, in which case the time rates of profit differ by only a negligible amount.(1)(2) Hayek's explanation of the fall in investment demand as causing the crisis is questioned by Haberler, who suggests that the points an entrepreneur will consider when faced with a rise in demand will be, inter alia, the existing degree of excess capacity, how long the higher prices can be expected to last, whether additional equipment is easily acquired, and the current level of the rate of interest. To Haberler "...it sounds rather fantastic that, given all these factors, if the price of the product rises he should be induced to invest less than he would have invested if the price had not gone up."(3)

However the case against Hayek's theory which seems to be the most relevant to this essay, is Kaldor's demonstration that Hayek's assumption regarding the rate of interest is quite incompatible with the conclusions he draws regarding producers' investment decisions.(4) Kaldor claims that in christening his "substitution-of-labour-for-capital" mechanism the "Ricardo Effect", Hayek has really mistaken its ancestry, and that his construction, in which interest plays a passive rôle, bears a much stronger likeness to one of Wicksell's propositions.(5) While this comment may appear to be a mere "splitting of academic hairs", it actually develops into an attack on the very foundation of Hayek's theory.

Ricardo,(6) we remember, was interested in the effects of a rise in the cost of labour relative to that of machinery. He suggested that

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1. Wilson, Op. cit. p. 172.

2. On this point Haberler has commented that "It is certainly misleading and unrealistic to assume that producers are able and ready to choose, and to shift freely and quickly between different methods of production involving such enormous differences in the length of the average period of production.... as suggested in the numerical examples by means of which Prof. Hayek explains the Ricardo Effect." Prosperity and Depression, United Nations, 1946, p. 489.

3. Ibid, p. 490.

4. N. Kaldor, "Professor Hayek and the Concertina Effect", Economica, Nov. 1942.

5. Kaldor, Op. cit, p. 364 &fff.

6. Ricardo, Principles of Political Economy, Gonner Ed., Sec V, p.p. 33-34.

there would be a substitution of machines for men, while the increased demand for machinery would increase the profits of the machine-producing firms. The higher profits would however be shortlived, owing to the inflow of free capital attracted to the industry, while the subsequent expansion of the output of machines would prevent their prices from rising permanently above the level ensuring "normal" profits.

Had he been dealing with the opposite case, that of the substitution of labour for machinery (Hayek's explanation of the end of the boom), Ricardo, we may suppose, would have argued on the assumption of a fall in the money cost of labour relatively to that of machines, and a consequent outflow of capital from the machine making industry. Hayek's case however is substantially different in that firstly, he is not directly concerned with changes in money wages, nor with changes in the money cost of capital equipment, and secondly, while Ricardo assumes a transfer of resources sufficient to equalise marginal rates of profit, this process is precluded in Hayek's account.(1)

Turning now to Wicksell(2) we find that, realising the need for some theoretical limitation on the size of the firm under the assumption of perfect competition, a solution that suggested itself to him was to assume that the supply of one of the factors of production at the disposal of the entrepreneur was limited.

> We must assume that the entrepreneur disposes over either a given amount of capital (his own or borrowed), or else a given area of land, or finally a given amount of labour.(3)

If the supply of capital to the individual entrepreneur is limited in this way it is obvious that changes in the rate of interest will not exert any direct influence on his choice of methods of production, and thus on his demand for investment goods. That method will be adopted which will maximise the return from this given amount of capital, while

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1. "... the forces making for a rise in one group of industries and for a fall in the demand for the products of another group of industries will become stronger and stronger...(until)....a sort of equilibrium might ultimately be reached with a high rate of profit in the first group, and no profits.... in the second group." Hayek, Op cit., p. 28.

2. K. Wicksell, Lectures on Political Economy, 1934, Robbins Ed.

3. Ibid, p. 244.

the particular method that will achieve this, will depend solely on the expected relationship between costs and selling prices, i.e. the degree of 'roundaboutness' will be determined by the level of real wages. e.g. If prices rise, while money wages remain unchanged, profits are maximised by adapting the method of production to the change by reducing the length of time for which investments are made, since, as Hayek correctly showed, the time rate of profit increases most on the "shortest" investments. Thus under this Wicksellian assumption, a fall in real wages does evoke the same reaction as a rise in interest under normal conditions, and real wages do determine capital intensity.

But when the supply of capital to the entrepreneur is infinitely elastic (Hayek's case of a constant rate of interest), the aim will no longer be to maximise the return on a given amount of capital, but to maximise the rate of return per unit of output, since additional capital is forthcoming at constant marginal cost. Therefore a rise in prices will encourage an expansion of output, but the method of production will not change because what was previously the optimum amount of capital per unit of output will still apply.(1) As Wicksell suggested "... if (a farmer) can get both for nothing, or next to nothing than he will carry on his farming more intensively using more capital and more labour,"(2) or to express it in another way, there will follow a "widening" of investment, but no "enshallowing".

Thus it seems that Hayek has attempted in "Profits Interest and Investment" to derive from an assumption regarding the rate of interest, conclusions which are quite incompatible with it, or as Kaldor has put it, he has attempted to,

> examine the problem of the substitution between labour and capital by postulating conditions under which the Principle of Substitution does not apply.(3)

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1. The most efficient distribution of factors requires that the ratio of marginal product to marginal cost be the same for each factor. Assuming such an optimum distribution, unless there is a change in money wages, interest, or in the cost of capital equipment, i.e. unless the rates of the marginal cost of labour to machinery changes, a change in selling prices will not alter the optimum distribution of capital outlay between labour and machinery.

2. Wicksell, Op. cit., p. 106.

3. Kaldor, Op. cit. p. 373.

Hayek subsequently realised this inconsistency in his reasoning, and in a later essay agreed that if the rate of interest is assumed to be constant, "a change in real wages cannot alter the relative costs of different methods of production."(1) He then introduces an amended hypothesis which very closely resembles Wicksell's original construction. He assumes that,

> there is no lending of money of any kind... entrepreneurs either owning all the capital they employ, and being effectively prevented from lending any of it or being limited by a strict rationing of credit.(2)

Investment is thus restricted to the allocation of this "internal" supply of funds between labour and various types of capital goods. On these amended assumptions he can now correctly draw the conclusion that changes in real wages will influence the disposal of these funds among investments of different rates of turnover, independently of the rate of interest.

On the more realistic assumption that the supply curve of investible funds to the firm is neither perfectly elastic, in which case changes in real wages are irrelevant to the optimum method, nor perfectly inelastic, in which case changes in the rate of interest are irrelevant, but is upward sloping, then real wages and interest will jointly influence the character of new investment. A rise in the demand for consumers' goods will raise the marginal efficiency of capital, and the demand for investment goods will increase to facilitate the expansion of output. As the supply curve of credit to the firm is now assumed to be upward sloping, the higher demand for investible funds will raise the rate of interest. The higher rate will induce a reduction in the capital intensity of new investment, i.e. there will be an increase in the rate of turnover of capital wherever possible.

The less elastic the supply curve of credit, the greater will be the rise in the rate following a given increase in the demand for funds, and the greater therefore the inducement to change production methods,

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1. Hayek "The Ricardo Effect", Economica May 1942, p. 145.

2. Hayek, Ibid, p. 130.

i.e. the greater the influence of any given fall in real wages. Conversely the more elastic the supply curve of credit to the firm, the smaller the influence of the same fall in real wages. Following a change in both real wages and in the rate of interest, the re-attainment of equilibrium requires that both the marginal efficiency of capital, and the "marginal productivity of capital intensification" should equal the new marginal cost of borrowing.(1)(2)

During the upswing, the rise in demand and the increase in the marginal efficiency of capital induce firms to add to their capital equipment until the marginal efficiency of capital again equals the marginal cost of borrowing, while in view of the rise in interest rates in the latter stages of the boom this must ultimately lead to a corresponding fall in the "marginal productivity of capital intensification." Thus, although his original assumption regarding the rate of interest was clearly inappropriate, Hayek's thesis that in the later stages of the boom, conditions emerge which encourage an "enshallowing" of investment appears to be corroborated by the method of analysis suggested by Kaldor.

It remains however to consider Hayek's explanation of the crisis itself, namely that,

> the increase in the rate of profit in the consumers' goods industries will ultimately become "strong enough to make the tendency to change to less durable and expensive types of machinery dominant over the tendency to provide capacity for a larger output."(3)

Or, in other words, it is claimed that the rise in the profit rate brings about an "enshallowing" of capital, sufficient to ultimately offset the

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1. See Kaldor, "Capital Intensity and the Trade Cycle", Economica, Feb. 1939, p. 50.

2. The "marginal productivity of capital intensification" is explained as the ratio between the increase in profits and the increase in the amount invested, when the scale of planned output is constant; and is contrasted with the "marginal efficiency of capital" which represents the ratio between the increase in profits and the increase in the amount invested, when the degree of capital intensity (i.e. method) remains constant. Ibid, p. 50n.

3. Hayek, Profits Interest and Investment, p. 33.

tendency to "widen" capital investment, and so leads to an absolute fall in the aggregate demand for capital goods. Hayek is adamant on this point and insists that, "... once the cumulative process has been entered upon, the end must always come through a rise in the profits in the later stages....[1] the rise in the rate of profit would by itself bring the boom to an end.[2]

At first sight it does appear somewhat paradoxical[3] that the increase in the demand for consumers' goods should lead to a fall in the demand for producers' goods in the way suggested particularly if as is usually the case, the demand for the latter is explained as a derived demand. Kaldor emphatically denies the validity of this part of Hayek's argument, and asserts that the fall in capital intensity can never outweigh the increase in investment demand which indirectly caused it. He suggests that the argument involves,

> the same fallacy as saying that because a rise in the demand for a commodity will cause a rise in its price, and the rise in its price causes a restriction in demand (because less is bought at a higher price than at a lower price), the increase in demand will lead to a reduction in the amount bought. No doubt the rise in price will make the increase in purchases (following upon the increase in Demand) less than it would have been if the price had not risen. But it cannot make it less than before since the price has only risen because the amount bought has gone up. In the same way, the reduction in capital intensity will make the rise in investment expenditure less than it would have been if capital intensity had remained constant. But it cannot eliminate it altogether because capital intensity would not have fallen if investment expenditure had not risen.[4]

Hayek, not impressed by the force of this counter-argument, replied by suggesting that Kaldor was being confused by his failure "to distinguish between the aggregate volume of profits, and the 'profit margins'"[5] and had missed the central point that "...the endeavour to provide a large output quickly such as may be caused by a large profit margin, may

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1. Ibid, p. 56 (italics not in original)

2. Ibid, p. 66.

3. See above Haberler's comment p. 47.

4. Kaldor, "Prof. Hayek and the Concertina Effect", Economica, Nov. 1942, p.p. 376-377.

5. Hayek, "Comment on Kaldor's Article", Economica, Nov. 1942, p. 385.

be the cause of a decrease in the volume of investment"[1] This assertion however neither indicated any possible weakness in Kaldor's criticism, nor proved whether the decline in capital intensity could ultimately result in a net fall in the demand for capital goods of all types.

In a recent study of the relationship of real wages and profits, S. C. Tsiang offers a possible explanation of the cause of this controversy.[2] We remember that for a change in real wages to influence the methods of production adopted, the supply curve of credit had to be upward sloping.[3] On this point Tsiang suggests that there are two possible interpretations of this concept of a "rising supply curve of credit", and here lies the cause of disagreement. It may mean,

(a) that the marginal cost of borrowing is an increasing function of the total amount invested by a firm, regardless of the period over which that investment takes place, or

(b) that the marginal cost of borrowing is an increasing function of the rate of increase of capital, regardless of the size of the firm's existing stock of capital.[4]

Kaldor clearly had the second meaning in mind as he described the rate of investment expenditure as being the product of the level of planned output and the amount of capital per unit of output, and the rate of interest as being an increasing function of the rate of investment.[5] He was therefore justified in concluding that since the degree of capital intensity only falls because the rate of investment rises, the reduction in capital intensity cannot exceed the increase in aggregate investment, and on these grounds his criticism was quite legitimate.

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1. Ibid.

2. S. C. Tsiang, Variations of Real Wages and Profit Margins, Pitmans, 1947, Chap. VII.

3. See above p. 70-72.

4. Tsiang, Op. cit., p. 125-126.

5. Kaldor, Op. cit. p. 376n.

On the other hand, if the marginal cost of borrowing to the firm rises with each addition to its capital stock (the first interpretation), then it is conceivable that a rise in prices and profits, and a fall in real wages, might induce an initial increase in the demand for capital such that the rise in the rate of interest would result in a reduction in the capital intensity of subsequent investment, sufficient to bring about a fall in the net demand for capital goods.(1) Thus it is not impossible, at least in theory, for the boom to come to an end in the way Hayek described. During the early stages of the upswing the supply of credit to the firm may be such that the marginal cost of borrowing is almost constant, as long as lenders do not consider the rate of increase of capital to be excessive in relation to the existing composition of the firms assets and liabilities, and its general prospects of profit. It is likely, as Hawtrey suggests, that the "widening" and "deepening" of capital will then proceed together. However, after revival has developed into boom and inflation, with price increases yielding no appreciable increase in output, the confidence of lenders in the advisability of further extending credit may become considerably weakened, particularly if there has been a substantial increase in the rates of firms' borrowed, to firms' "own" capital. The supply curve of credit to the firm may become inelastic, while the cost of raising further loans may well depend primarily on the amount of the firm's total borrowing to date. Combined with the rise in prices this could then induce as Hayek claims, a transfer of capital outlay to "shorter" methods sufficient to bring about a fall in the demand for the output of the producers' goods industries as a whole.

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1. Hayek described the supply curve of credit to the firm as being, "not a continuous supply curve but an upward stepped curve, showing that the rate of interest, while constant within certain limits, will go up by distinct steps whenever one of the limits is reached up to which (the firm) can borrow at a given rate." These curves "will be shifted to the right as prospects get better..." Hayek, "Ricardo Effect", Economica, May 1942, p.p. 138-139.

of the banking system, Hawtrey's analysis emphasizes the distinction between the short-term and long-term markets as sources of finance. The kernel of his theory lies in the alleged reaction of working capital to changes in the Bank Rate. The process of adapting the level of inventories to these changes is interpreted as the medium through which credit policy is transmitted to the economy as a whole. In contrast the long-term rate of interest, and investment in fixed capital, play a much less active part in that the long term investment market is regarded as a mechanism which will re-inforce, rather than cause, a movement of expansion or contraction. It is not surprising therefore that Hawtrey turns to the short-term rate of interest as the most potent instrument for the preservation of stability. He has great confidence in the efficacy of appropriate adjustments in the short-term rate, provided they are made promptly and with reference to some reliable index, though he does admit that once the "vicious circle of expansion or contraction" has become cumulative, other more drastic measures must be taken to restore equilibrium.

In this regard the banking experience of the nineteenth century has obviously influenced Hawtrey a great deal. His preoccupation with commercial credit, and his nâive, almost child-like faith in the Bank Rate are largely, we suspect, the result of the fascination which the banking policy of a previous age seems to hold for him. But we may well doubt whether historical evidence is necessarily the most reliable guide in searching for a solution of contemporary problems, in view of the tremendous changes that have since taken place both in the organisation of production, and in the financing of trade and industry. On this point, an observation of J. R. Hicks seems to be worth quoting at length:

> In a predominantly commercial economy such as that which existed in the early 19th century, the widespread use of bills of exchange made the whole system extremely sensitive to fluctuations in short interest rates, in such conditions there can be little doubt that it was the short rate which was the cutting edge of the whole interest structure. It may indeed be maintained that it was because the system was so sensitive to fluctua-

> tions in the short rate that the long rate was so steady as it usually appears to have been in those days. But with the change in the relative importance of industrial and commercial business and with the corresponding changes in methods of business finance, the long term rate has inevitably grown in importance... Purely monetary cycles arising under a system of short financing can largely (though even then not wholly) be ascribed to deficiencies in banking policy; but under a system of predominantly long financing there may be a strong tendency to monetary instability, which the most ideally alert banking policy could not conceivably do much to prevent.(1)

Recent empirical studies of the influence of changes in the short term rate on the investment decisions of business men(2) tend to bear out the impression that Hawtrey's insistence on a direct link between this rate and the level of inventories is something of an anachronism.(3) His attention has unfortunately been diverted from what seems to be the more urgent task of investigating which sectors of the economy are to-day the most responsive channels through which the monetary authorities may influence the level of activity etc., of the economic system as a whole.(4) In spite of evidence to the contrary, he still holds that those who formulate economic policy need only await the perfection of methods for regulating short-term credit for cyclical fluctuations to be eliminated altogether. Not without justification has it been remarked that, "to believe in Mr. Hawtrey is to be an optimist about the Trade Cycle."(5)

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1. J. R. Hicks, A Contribution to the Theory of the Trade Cycle, Oxford University Press, 1950, p.p. 152 - 153.

2. Meade and Andrews, Oxford Economic Papers, October 1938. Andrews, O.E.P. Feb., 1940. J. F. Ebersole, Harvard Business Review, Autumn, 1938.

3. In a summary of the replies given by business men to a questionnaire dealing with the significance of the rate of interest, Meade & Andrews reported that, "There is almost universal agreement that short-term rates of interest do not directly affect investment either in stocks or in fixed capital. The reason given for this is either that the business does not borrow from the bank, or else that the effect of changes in the rate is too small in comparison with the profit margin to make any difference." Oxford Economic Papers, 1938, p. 28.

4. C.f. Henderson's suggestion that the Stock Exchange may well merit investigation in this regard. Ibid, p. 8.

5. Kaldor, "Mr. Hawtrey on Short and Long-Term Investment," Economica, Nov. 1938, p. 462.

However, in support of Hayek's warning that "... it is vain to ask for empirical confirmation of this particular mechanism",(1) Dr. Tsiang, in his analysis of wage rates, profit margins, and investment during the years 1919 to 1938, has found that,

> never, during the period we have studied was the decline in the ratio of the net investment to the increase in inventories, accompanied by an absolute decline in the net investment, nor the decline in the ratio of the net investment in durable equipment to the value of the increment of current output, accompanied by an absolute decline in net investment in durable equipment.... Therefore we must conclude that Professor Hayek's theory, as it now stands, is not sufficient to explain the upper turning point of the trade cycle or the break of the boom.(2)

Part Three.

In this essay an attempt has been made to describe the trade cycle theories of R. G. Hawtrey and F. A. Hayek, from the point of view of the part played by the rate of interest in the theories of each economist. By way of conclusion we now propose to make one or two general observations which, it is hoped, will help to complete the picture. We have noted that while both place great importance on the monetary aspect of cyclical fluctuations, Hawtrey considers that a theory which explains the changes in the level of money demand is sufficient explanation of the whole process. Hayek, on the other hand, regards the purely monetary phenomena as being symptomatic of more deep-seated maladjustments which follow from changes in the distribution of total money outlay between consumption and different types of investment. While both trace the origin of monetary instability to the changes in the lending policy

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1. Hayek, Profits Interest and Investment, p. 6.
2. Tsiang, Op. cit., p.p. 151 - 152.

Hayek's deeper analysis stems from his conviction that cyclical fluctuations cannot be adequately explained without taking account of the "real", as well as the more superficial monetary phenomena. Although periodic fluctuations in the volume of money may be symptomatic, they are themselves in no sense the essence of the trade cycle. What have to be described and explained are those more fundamental changes in the character or form of investment goods, and the changes in production methods which follow the expansion and contraction of the money supply. But whereas it may be held that Hawtrey has overemphasized the distinction between the two main sources of investible funds, and between the short-term and long-term rates of interest, Hayek has paid so little attention to this aspect of the problem that his neglect has given rise to needless confusion and avoidable controversy. For example the over-investment, which is described in "Prices and Production" as taking place during the upswing, appears to take the form of instrumental capital goods which are specific to the stage of production for which they are designed, i.e. long term investments in fixed capital. Yet paradoxically it seems to be implied that these investments were financed directly by bank credit, which in practice is almost always confined to short term investment in working capital. It is easy to reach the misleading conclusion that the boom ends with the raising of the bank rate merely because entrepreneurs have "borrowed short and invested long" - an oversimplification certainly not intended by Hayek.

Of greater immediate interest however is the significance attached to the rate of interest itself, as a causal factor in his explanation of the trade cycle. In this regard his estimate of the degree to which a theory based on structural changes in the methods of production need depend on changes in the rate of interest has undergone considerable revision. In his earlier discussions the investment boom was the result of credit expansion following the setting of the market rate below the equilibrium or "natural" level. The lowering of the market rate of interest was reflected in a narrowing of the price margins between the various stages of production which provided the link between the direction which new investment took and the rate itself, while the

boom was terminated by the inevitable rise in the market rate, and the loss of value which followed the widening of the price margins. In contrast, his later explanation of essentially the same structural changes, represented an attempt to escape from this dependence on interest, in favour of a more realistic consideration of the influence of the rate of profit on investment decisions. The divergence between the market rate, and the natural rate of interest, yielded pride of place to the divergence of real wages from money wages. The boom is now explained as originating in the impetus given to the capital goods industries by the decision to"substitute machines for men"due to the high real wages prevailing during the depression, and is brought to an end by the progressive rise in the rate of profit, which ultimately has the effect of reducing the demand for investment goods. However, there does seem to be a close parallel between the rise in the rate of interest and widening price margins of the earlier version, and the rise in the rate of profit in the consumers' goods industries, in "Profits Interest and Investment." In this regard it may be helpful to regard Hayek's two distinct approaches as being specifically limiting cases. It is here that Kaldor's analysis of the conditions which would determine whether a change in the rate of interest, or in the level of real wages would have the predominant influence on the character of investment, is of great assistance in reading a synthesis of Hayek's two constructions. Kaldor has shown that, ceteris paribus, the more elastic the supply of credit, the more important will be influence of interest (and the less important the influence of real wages) on the method of production adopted. Conversely, the less elastic the credit supply, the greater will be the influence on capital intensity, of changes in real wages.

It may be suggested therefore, that the investment decisions taken during the revival and early stages of the upswing are perhaps most appropriately analysed in terms of the level of the rate of interest since, during this period the supply of credit to the individual firm tends to be relatively elastic. The developments during the later stages of the boom however cannot be adequately explained by reference to interest alone, but must be considered in conjunction with the

effects on investment of the rise in profit rates, and fall in real wages, as the supply of credit to the firm becomes less elastic.

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