CHAPTER VII

CRITICAL CONCLUSIONS ON SOME BUSINESS-CYCLE THEORIES

(7.1) Introduction; Reservations to be made

The foregoing analysis of the business-cycle mechanism makes it possible to draw a number of conclusions concerning the validity of some of the theories of the business cycle. These conclusions are subject to numerous limitations which may be shortly summarised here; further details will be found in the sections dealing with the separate relations.

(i) The period and country considered are in many respects special. It has even been said that no business cycles have occurred in the post-war period (Cassel, Hawtrey). Without going so far, it may be stated that the analysis showed many abnormal features. Up to 1927, the development was fairly stable ; the occurrence, however, of condition favouring stock-exchange speculation — in our terms: $n-n_{-1} > 20$ — brought about a fundamental change: both the boom up to 1929 and the following depression showed rather an anti-damped character. Another exceptional feature was the absence of any considerable rise in prices in 1929.

² Cf. Haberler, Prosperity and Depression, revised and enlarged edition, 1939, page 14.

3 "... a brief examination of the period 1922-1929 shows shat the cyclical fluctuations have been notably moderate." Recent Economic Changes, Report of the Committee on Recent Economic Changes (New York, 1929) Vol. I, page 12.

¹ The Theory of Social Economy, Vol. II, page 538: "The economic development of post-war times has been so strikingly dominated by great monetary disturbances that trade cycles of the earlier kind are no longer applicable."

- (ii) Some important statistics used are admittedly incomplete.
- (iii) Only slow changes in the coefficients have generally been assumed to take place.
- (iv) Important explanatory factors for some of the variables included may have been omitted.
- (v) The determination of some of the regression coefficients is interfered with by "multicollinearity". This does not necessarily invalidate the results.

An example of a certain compensation of errors, in connection with the consumption equation, has been elaborated in the previous chapter. There are a number of similar cases in which the uncertainty of coefficients due to multicollinearity is not important for the final results. But if, for example, the series used for consumption had to be replaced by another estimate showing different fluctuations, then a revision of some results might be necessary.

(7.2) DIFFICULTIES IN THE CLASSIFICATION OF THEORIES

Let us begin with some remarks on the classification of theories. A first distinction may be made between exogenous and endogenous theories. By an exogenous theory we mean a theory explaining cyclic movements by cycles in one or several of the "data" — i.e., of the non-economic phenomena (such as crops or psychology).

Endogenous theories, on the other hand, explain the cycles without the help of cycles in data. In the Introduction and in Chapter VI, we saw that the following conditions must be fulfilled if an endogenous cyclic movement is to develop:

- (i) At least one of the relations must be dynamic—
 i.e., must contain variables relating to different time-points
 (as special cases, differentials and cumulants of variables
 may be mentioned);
 - (ii) There must be an initial disturbance of the system;
- (iii) The final equation must fulfil certain conditions; otherwise, either a cumulative or a one-sided damped

movement only may develop. These conditions have been enumerated in detail for a second-degree characteristic equation; it would take us too far afield to give them for more complicated cases.

In the light of this knowledge, let us now consider how a logical classification of the various possible endogenous theories can be made. It is obvious that dynamic features appear in one or other of the various relations. Independently of this, the initial disturbances may occur in different parts of the system. In principle, therefore, the dynamic features in a system of variables may be present in equation 1, equation 2, equation 3, and so on, or in any pair of such equations, or in any three, etc. The same is true of the disturbances. A classification could therefore be made either according to the localisation of the dynamic features or according to the localisation of the disturbances. This, however, would lead to a very large number of possible theories, even if we considered only the most important relations, leaving out, for example, the definitional equations and those "explaining" the variables of minor importance.

Turning to the theories actually put forward by various authors, it appears that many of them are not complete in the sense of dealing with all coefficients and lags necessary to establish the equations. Some emphasise one dynamic feature (e.g., Aftalion's theory; the acceleration principle); others, certain disturbances (e.g., the agricultural theories). Others again do not explicitly state dynamic features, although they contain them implicitly. The over-investment and under-consumption theories are of this type. Taking the very simple case of over-production in a certain part of the system, we find on closer examination that most explanations imply either that unexpected additions to production (i.e., disturbances) occur, or that production takes some time (i.e., a dynamic feature), or, thirdly, that it is influenced by the rate of increase in some variable (another dynamic feature).

Finally, some of the general theories draw special attention to various sorts of "bottlenecks". The latter are not, as such, dynamic relations, but, in our language, curvilinear relations, in which each coefficient takes different values at different distances from equilibrium. For systems containing such relations, the likelihood that condition (iii) above is fulfilled is greater at least for some values of the variables. Thus, whereas curvilinear relations are not sufficient to bring about cyclic movements if dynamic features are not present in the system, they may cause a non-cyclic (cumulative) movement to become cyclic at a definite distance from equilibrium. This, by the way, is the raison d'être of Professor Haberler's subdivision, in his own theory, of the cycle into four parts: two cumulative processes and two turning-points.

In conclusion, it may be stated that the points stressed as essential by various authors come under one or other of (i), (ii), or (iii) above, and this makes it difficult to give a logical classification of their theories. That is probably the reason why, in the usual classification — also followed by Professor Haberler in his book — it is not always clear which of the above-mentioned aspects has been chosen as the principle of classification.

With these considerations in mind, let us see what is the place in our system of the relations stressed by certain prominent theories, and their relative importance for the cyclical mechanism. We shall adopt the same classification as Professor Haberler: the rôle of monetary factors may therefore be considered first.

(7.3) THE ROLE OF MONETARY FACTORS

Professor Haberler says:

"Money and credit occupy such a central position in our economic system that it is almost certain that they play an important rôle in bringing about the business cycle, either as an impelling force or as a conditioning factor." ¹

HABERLER, loc. cit., page 14. The reference to the "impelling force" applies more especially to the supply side of the market, and particularly to a deliberate pressure on the interest rate by the banking system.

Our study leads to the following conclusions in this respect:

- (a) The influence of interest rates, in the restricted sense of discount rates and other short-term rates, on goods is found to have been very small (equation (2.4)).
- (b) The influence of long-term interest rates on investment activity in durable goods is found to have been moderate, the influence of profits and, in the case of residential building, of the shortage and abundance of houses 1 being much larger (equations (2.4) and (2.5)).
- (c) Although statistics are incomplete, it is nevertheless probable that movements in commodity stocks were dependent only in a small degree on interest rates (equation (2.6)).
- (d) Conclusions (a) and (c) are confirmed by the results found for short-term loans, which also seem to have depended very little on the short-term rate of interest (equation (4.3)).
- (e) The supply of short-term credits seems to have been fairly elastic (equation (4.56), in combination with equation (4.63)).
- (f) Evidence of a change in the attitude with regard to rationing of credit, apart from the use of interest rates, is not easily found; for neither investment activity nor the demand for loans shows in 1929 any abnormalities in its dependence on its causes. In the event of deliberate rationing, we should expect actual investment activity and new loans to stand below the levels prescribed by their "demand factors" (cf. equations (2.4) and (4.3)).

Thus, the general impression is that the monetary system has been elastic. This means that no large influence has been exerted by monetary hindrances on the effects of other factors,

¹ This fact seems, even more than others, to be peculiar to the United States.

so that these other factors have been allowed to work out fairly completely. Thus the evidence does not seem to support any view according to which influences in the field of money are the chief factors in the business cycles considered.¹ Only if interest rates had showed much larger fluctuations than they actually did would their influence have been important. This does not of course imply that a direct attempt to increase the money value of total demand — e.g., by Government spending — would not be important. It did not, however, occur in a large degree in the period studied, and the cycles found must be explained otherwise.

For the period studied, only small traces are found of the tendencies emphasised by Mr. Hawtrey.² The proportion of wages to other incomes is only very slightly changed, and the amount of legal money in circulation did not increase in 1928 and 1929; nor were the limits of the note issue reached.

A fairly considerable influence, however, was found to be exercised by hoarding in the following years, as a consequence of the severe depression. This influence, which acted through interest rates on share prices, and from them on consumption (equations (2.1), (5.3)) and investment (equations (2.4), (1.9)), seems to be the most important from the monetary sphere.

(7.4) Non-monetary Over-investment Theories

We may now turn to some of the best-known non-monetary theories and the factors they use in the explanation of the cycle. First the question of over-investment may be examined.

Professor Haberler describes over-investment as a "vertical disequilibrium or maladjustment" in the structure of production — i.e., a situation in which industries in the higher stages of production are over-developed relatively to those in the lower stages. The supporters of the over-investment school maintain that such a situation arises during the upswing.

¹ Cf. Haberler, loc. cit., Chapters 2 and 3A. ² Cf. Haberler, loc. cit., Chapter 2. It may be remembered that Mr. Hawtrey doubts whether an ordinary business cycle has shown itself in that period.

In accordance with this view, our equations show that the higher the value of Z (general profits), the higher is the ratio capital goods production bears to consumers' goods production. This fact certainly plays a rôle in the cumulative process: the greater Z is, the greater, a little later, becomes investment activity; and the greater the latter, the greater Z is at the same moment, because of the higher general activity. This process is very clearly shown in the equations, which state, on the basis of our calculations, that profits are a highly important factor for investment activity.

One special form in which the over-investment theories have sometimes — and especially in the last few years — been formulated is that of the acceleration principle — i.e., that fluctuations in investment would be chiefly governed by the rate of increase in consumers' goods production.

"The proposition that changes in demand for consumers' goods are transmitted with increasing intensity to the higher stages of production serves, in conjunction with other factors which have already been mentioned, as an explanation of the cumulative force and self-sustaining nature of the upward movement. . . . The matter is of the greatest practical importance for the reason that much light is shed on the fact, which in the last few years has been more and more recognised and emphasised, that it is the production of *durable* goods, of consumers' goods as well as of capital goods, which fluctuates most violently during the business cycle." ¹

This principle we have not found to be of much importance, at least so far as a direct influence on the shorter fluctuations of investment activity is concerned (equation (2.4)). It must not be overlooked, however, that there is a high intercorrelation between the production of consumers' goods and that of investment goods; but, even in countries where this parallelism was not found to exist, we found only little direct influence of the rate of increase in consumers' goods production.²

Over-investment is attributed by several authors to the capitalistic structure of production, and especially to the long period required for the construction of physical capital.³

¹ Haberler, loc. cit., pages 86-87. ² Cf. Vol. I, Chapters III and V.

³ Cf. Haberler, loc. cit., pages 134-136.

In our equations, the construction period plays a very definite and also a rather important rôle. For houses, it is one of the causes — but here only a minor one — of the duration of the cycle. For general investment activity, the existence of a lag of about half a year has a clear influence on the damping ratio and the length of the cycles. This can be seen by changing the lag between profits and investment: this changes considerably the coefficients in the "final equation" which determine the cycles (cf. section (6.9)). The relation between the construction period and the period of the cycle is very complicated; at any rate, it does not follow from our calculations that cycles would be abolished, were there no lag in equation (2.4).

Before leaving these theories, a word may be said about the order of the revival in consumers' goods production and producers' goods production respectively. A good deal of attention is given to this question by Spiethoff,¹ Cassel, Mitchell, and others, and they all hold the opinion that capital goods show the cycle before consumers' goods. Statistically, no evidence of any systematic lag or lead is found, either in the United States after the war, or in a number of other countries.

(7.5) CHANGES IN COSTS

The element of changing costs of production, which has sometimes been stressed as a cause of crises,² seems to have been

¹ Cf. HABERLER, loc. cit., pages 78-79:

[&]quot;The phenomenon (alleged to be frequent) of consumers' goods industries feeling the setback of the depression much later than the capital-goods industry is regarded as a verification of the [over-investment] theory."

² Cf. MITCHELL, quoted in HABERLER, loc. cit., pages 107-108.

[&]quot;The decline in overhead cost per unit of output [which was brought about by the first increase in production after the trough of the depression] ceases when enterprises have once secured all the business they can handle with their standard equipment, and a slow increase of these costs begins when the expiration of the old contracts makes necessary renewals at the high rates of interest, rent, and salaries which prevail in prosperity. Meanwhile, the operating costs rise at a relatively rapid rate. Equipment which is antiquated and plants which are ill located or otherwise work at some dis-

of less importance. This may be supported by the following evidence.

- (i) In so far as higher costs mean higher wages, they are also, if really paid, at almost the same moment, higher incomes, and in the balance of total profits they almost cancel out (relations (5.10), (2.1), (1.11)). This does not of course apply to a country with a large international trade; but the United States is to a high degree a "closed economy". Nor does it apply to those higher costs which are not paid out but which prevent production from taking place. In this connection, however, the conclusions (ii) and (iii) are of importance.
- (ii) The demand for investment goods seems to be rather inelastic with regard to price; and in any case the adverse influence of a high price will as a rule, and partly as a consequence, be considerably outweighed by the favourable influence of profits occurring usually at the same time (equation (2.4)).
- (iii) Consumption expenditure is also not influenced unfavourably, but rather favourably, by a rise in prices (equation (2.1)).

In short, there has been a tendency for moderate increases in costs to lift all money values to a higher level, rather than to upset the equilibrium. Equilibrium is only upset if prices go up much more than they did in 1929, as they did for instance in 1920 and in some pre-war cycles.

(7.6) Over-investment us. Under-consumption Theories

Under-consumption theories are, in a sense, the opposite of over-investment theories. Professor Haberler summarises

advantage are again brought into operation. The price of labour rises, not only because the standard rates of wages go up, but also because of the prevalence of higher pay for overtime. Still more serious is the fact that the efficiency of labour declines, because overtime brings weariness, because of the employment of 'undesirables', and because crews cannot be driven at top speed when jobs are more numerous than men to fill them. The prices of raw materials continue to rise faster, on the average, than the selling prices of products. Finally, the numerous small wastes incident to the conduct of business enterprises creep up when managers are hurried by a press of orders demanding prompt delivery."

as follows their divergent conclusions:

"Is the turn from prosperity to depression brought about by a shortage of capital or by an insufficiency of the demand for consumers' goods? Does the investment boom collapse because the supply of capital becomes too small to complete the new roundabout methods of production, or because consumers' demand is insufficient to sustain the increased productive capacity?

"Both theories contemplate what we have called a *vertical* maladjustment in the structure of production; but these vertical maladjustments are not of the same order. As we shall see at once, the 'top' of the structure of production according to the one theory, the 'bottom' according to the other, is over-developed in relation to the flow of money. In a sense, both theories can be described as over-investment theories. In the one case, new investments are excessive in relation to the supply of saving; in the other case, they are excessive in relation to the demand for the product. That the distinction is important may be seen from the fact that the conclusions drawn as to the appropriate policy to follow in order to avert, mitigate or postpone the breakdown are diametrically opposed. According to the one view, every measure that tends to increase consumers' demand and to reduce saving is helpful. According to the other view, exactly the opposite policy is called for." ¹

When putting the crucial question with regard to the situation that prevailed in the United States in the year 1929, one circumstance of importance stands out. The over-investment theories are based on the hypothesis of full employment of all capital goods, a situation which may have been approximately realised in some pre-war boom years. It was, however, far from existing in 1929.² For this reason, it is highly doubtful

¹ Cf. HABERLER, loc. cit., pages 128-129.

² This is reflected in our equations by the absence of any bottleneck — even in capital-goods industries — in 1929 (equations (3.3) and (3.5)). The lack of capacity figures covering a representative part of industry makes it impossible to indicate how far production could still have risen in 1929 before a scarcity of capital goods would have developed.

whether the over-investment theory was applicable to that situation. There is a further reason — viz.: the elasticity of the credit system (cf. section (7.3)), even in 1929 — which makes it probable that a deficiency of savings, if it had happened, could easily have been remedied by the use of additional credits. In other words, if more had been saved in 1929, it would have led to such a slight fall in interest rates that investment activity would hardly have been stimulated; and the loss of this amount of extra saving in the market for consumers' goods would probably not have been compensated.

(7.7) AGRICULTURAL THEORIES

Finally, some attention may be given to agricultural theories. Professor Haberler distinguishes between the influences exerted by agriculture — i.e., by changing harvests — on general business conditions, and the influences exerted by general business conditions on agriculture.²

The influence of irregularities in harvests on general business conditions shows itself in the determination of farm prices (equation (3.4)) and, consequently, on general prices (equation (3.3)), as well as in the influence of farm prices on consumption (equations (2.2), (2.3) and (2.1)). Farm prices themselves are rather strongly affected by supply fluctuations (the flexibility being about 2); but it seems doubtful whether the influence of f on the system as a whole is large. This doubt

¹ Cf. G. Cassel, reproduced in Haberler, loc. cit., page 79.

[&]quot;The typical modern trade boom does not mean over-production, or an over-estimate of the demands of the consumers or the needs of the community for the services of fixed capital, but an over-estimate of the supply of capital, or of the amount of savings available for taking over the real capital produced. What is really over-estimated is the capacity of the capitalists to provide savings in sufficient quantity."

² Cf. Haberler, loc. cit., page 154.

is primarily based upon the following evidence:

- (i) Farm prices fluctuate chiefly because of changes in demand; the influence of $L_w + L_s$ in equation (3.4) is much larger than that of f.
- (ii) The fluctuations in farm prices are only to an extent of 20% reflected in the fluctuations of prices of finished consumers' goods and services (equations (1.8) and (3.3)).
- (iii) The rôle of prices in the business cycle is restricted for reasons given above (section (7.5).

As to the influence exercised on agricultural incomes by fluctuations in industrial activity accompanied by similar fluctuations in money demand in general, Professor Haberler remarks that "the process is tempered by two factors:

- "(1) The demand for consumers' goods as a whole is more stable than the demand for all goods;
- "(2) The demand for consumers' goods of agricultural origin is more stable than that for consumers' goods as a whole." 1

The influence of general business conditions on farm prices is reflected by the term $2.61(L_w+L_s)$ in equation (3.4). This figure points to an income elasticity for expenditure on agricultural goods of about 0.5 (cf. section (3.4)), whereas we found the income elasticity for total consumption to be in the neighbourhood of 0.9; ² these findings are in accordance with Professor Haberler's second point. The first point is equally confirmed by our figures.

In commenting on the various "agricultural" theories, Professor Haberler observes: 3

"It is a more serious shortcoming of these 'agricultural' theories that they are not agreed on the important point as to whether

³ HABERLER, loc. cit., page 154.

HABERLER, loc. cit., pages 165-166.

A weighted average of the marginal propensities to consume with respect to urban labour and non-labour income, and farmers' income, divided by U'/average income.

plentiful harvests are correlated with prosperity and poor harvests with depression, or the other way round; and their divergence in this respect is symptomatic of a fundamental disagreement as to the channels by which the influence of agricultural fluctuations is brought to bear on other departments of economic life."

In this connection, it may be pointed out that, in our final equation for Z^c , various terms occur representing the influence of autonomous changes in harvest (f), the first and largest with a negative, the second with a positive sign $(-1.847f + 0.708f_{-1})$. And it is quite probable that, in any final equation obtained for other variables, these terms will again be different from those in the equation for Z^c . All this reflects the fact that harvest fluctuations work in a complicated way, partly positively, partly negatively.

(7.8) Some General Statements on the Character of the Cycle

This set of observations on some of the more important business-cycle theories may be concluded by a consideration of certain very general statements made by a number of different authors on the character of cyclical movements.

1. The first is that the depression is an inevitable consequence and a necessary readjustment of certain disproportionalities which have previously developed. Our statistical investigations show that, with the given economic structure (described by the coefficients in our elementary equations), the depression

¹ Cf. Haberler, loc. cit., pages 57-58:

[&]quot;The depression was originally conceived of by the authors of the monetary over-investment school as a process of adjustment of the structure of production, and was explained in non-monetary forms. During the boom, they argued, the process of production is unduly elongated. This elongation has accordingly to be removed and the structure of production has to be shortened or, alternatively, expenditure on consumers' goods must be reduced (by retrenchment of wages and other incomes which are likely to be spent wholly or mainly on consumers' goods) sufficiently to make the new structure of production possible. This involves a lengthy and painful process of rearrangement."

is certainly a consequence of the preceding boom. It is necessary, however, only in so far as (i) the economic structure is not changed and (ii) no exogenous shocks (amongst which certain measures of policy are to be counted) occur. Several forms of policy seem to be possible which would prevent a depression from developing and yet overcome the disproportionalities.

- 2. A second proposition is that there may occur an automatic revival from a depression. The mechanism found for the United States is such that an automatic revival, indeed, is to be expected for the short waves: the movements were found to be cyclical (cf. Chapter VI). As to movements of longer duration, we are not yet able to make a definite statement (cf. page 149).
- 3. A third statement made by a number of theorists is that "the recovery from the depth of the depression has a wrong twist from the beginning". This statement must probably be understood in the sense that it is impossible to prevent a boom if once recovery has started from the bottom. In this sense it is the counterpart of the above statement 1, and seems untenable on the same grounds. This has been shown explicitly in section (6.3); and, since this demonstration is independent of any particular features of the system of equations, it may as well be formulated in this non-mathematical way: that the position in any year, though depending in part on what happened before, may be considerably influenced by fresh "shocks"; and, if such shocks are a systematic set of measures, it is certainly within the possibilities to prevent a boom from developing to dangerous heights.

¹ Cf. Haberler, loc. cit., page 391.