

**WAGES POLICY AND
THE PRICE LEVEL**

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BY

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of actual wage-rates as one of the given conditions, and therefore ascribe to price fluctuations the whole of the damage. Others assume that if wage-rates were altered as quickly and as much as in these circumstances they should be, the harm done by a fluctuating price level, in causing or enlarging fluctuations in the equilibrium rate of wages, would be relatively small.

It is the aim of the present essay to see what is the truth in this respect. An attempt will therefore be made to find out not only how far wage-rates, with economic advantage to the community, could be made to conform to changes in the monetary demand for labour—and therefore how much of the unemployment resulting from those changes would be removed—but also, as an essential part of the analysis, by what means this adaptation of wage-rates could be brought about. Thus while it is hoped to shed some light on an aspect of monetary policy, the main task will be to study the separate problem of how, and to what extent, the level of wage-rates could be kept adjusted to a variable price level that is taken as given.

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economic welfare, including in economic welfare the benefits of stable employment. Policies co-ordinated in this way will be said to be in harmony; otherwise they will be said to be in disharmony. It is the object of this book to discuss the manner and extent to which disharmony could be avoided, with net advantage to the community, by means of regulating wage-rates.

It is generally agreed that, owing to serious maladjustment between wage-rates and the level of prices, post-war wage-rates have been above the equilibrium level. Evidence of this maladjustment has been sought in the continuously large volume of unemployment. But the mere existence of unemployment, even on a large scale, is not in itself conclusive proof.¹ For the excess of the supply of labour in some industries over the demand for it at the ruling wage-rates might be matched by an equivalent scarcity in other industries; the disappearance of unemployment being prevented by immobility of labour.² But in fact the unemployment has been widespread; and it may therefore be taken that, between the conditions of the demand for and supply of labour and the general level of wage-rates, maladjustment has existed.³ The equilibrium wage-rates have been below those which have ruled.

¹ See Pigou, "Wages Policy and Unemployment" (*Economic Journal*, September 1927).

² This, in Professor Clay's view, is in fact the main cause. See "Unemployment and Wage-Rates" (*Economic Journal*, March 1928; reprinted in *The Problem of Industrial Relations*, pp. 103 et seq.).

³ Cf. Pigou, *ibid.*

There is a wide difference of opinion, however, regarding what is the most practical way in which this maladjustment could be corrected. On the one hand, it is sometimes argued that since unemployment exists because wage-rates are too high, it would be removed by their being forced down, and that therefore they should be forced down. On the other hand, there are those who believe that such a policy would lead to international competition in wage-cutting, and hence that it would be largely self-defeating. But notwithstanding this difference of opinion about inferences, the conclusion regarding the fact of disparity between post-war ruling and equilibrium wage-rates is important. For if it can be rightly assumed that a disparity of this size causes more net loss of economic welfare (including the benefits of stable employment) than would have to be undergone in order to prevent it, it follows that, in an economic system that allows it to happen, there must be either an inconsistency in aim or a defect in organisation, of which the disparity itself and the resulting unemployment are manifestations.

Maladjustment between general wage-rates and the conditions of demand for and supply of labour can come about through a change either in the level of wage-rates or in the conditions of demand or supply. Given the supplies and efficiency of the factors of production, and given the liking of the people for income and their dislike for work, it can occur only as a result of a change in either

wage-rates or the value of the product—in either, that is to say, wage-rates or the general level of prices.¹ But it may be caused not only by changes in the profitableness of employing a given quantity of labour, but also by changes in the quantity of labour available; it can be originated otherwise than by a change in the relationship between wage-rates and the price level. Nevertheless, that relationship might be modified in a way that would enable the maladjustment to be avoided. It can therefore occur only if wage-rates and the price level are so related as to permit it. Whether they will do so or not will depend on the nature of the monetary and the wages policies. Hence it is in the relationship between these policies that the inconsistency in aim or the defect in organisation mentioned above must be sought.

The effects of a given change in the relationship between wage-rates and the price level in causing unemployment will not, even if the total supplies of the various factors of production are unaffected, necessarily be constant so long as the new relationship lasts. Even in these circumstances the equilibrium level of wage-rates will vary according to the length of time, following the initial disturbance, allowed for industrial readjustment, and therefore the size of the disparity between the given level of wage-rates and the equilibrium level will tend to alter. This tendency is almost bound to be hidden, however,

¹ The particular price level that is relevant will be discussed below. See III. ii. 2 and III. iii. 1.

by the effects of other changes; neither the supplies of the factors of production nor the new adjustment between the level of prices and wage-rates being likely to stay the same for long. The extent of the change in the percentage of unemployment that will follow, and so appear to result from, an alteration of a given size in the relationship between wage-rates and the price level will therefore depend partly on the strength of existing tendencies to change in employment set up by previous alterations in that relationship.

It has been said above that harmony exists between a country's monetary and wages policies when they are so co-ordinated that, notwithstanding changes in the relevant conditions, the relationship between the price level and wage-rates is always that which is economically best for the community. This implies that the two policies must be quite consistent with each other. But if they are sectional and controlled by different interests, they are almost sure to be inconsistent with each other to some extent. There is therefore little possibility that they will be quite harmonious, and thus jointly promote the maximum economic interest of the community, unless both are formulated and controlled by the same authority.

Disharmony manifests itself in disequilibria between wage-rates and the demand price per unit for the available supply of labour, and hence in fluctuations in employment. Such disequilibria may be set up by a movement—or by the lack of it if conditions require a movement—

either in the price level or in wage-rates. Disharmony may therefore be either "monetary disharmony" or "wages disharmony." And both sorts may be of different degrees. For the extent of the resulting disparity between the ruling and equilibrium wage levels may be lessened, if the disparity is due to monetary policy, by an economically appropriate alteration in the level of wage-rates, and if it is due to wages policy, by an economically appropriate alteration in the price level. Such adjustment of the level of wages or of the level of prices will be spoken of as its "unilateral adjustment." If it is to be the best readjustment from the point of view of the community, it cannot be large enough to do away with the disparity altogether, but it can do away with it to some extent.

We are here concerned with the relationship between the demand for and supply of labour in general and wage-rates in general; that is, we are concerned with a relationship between averages. For though labour is demanded not in general but for specific purposes, and though there is no such thing in fact as a single wage-rate for the whole of industry, yet there are, in given conditions, both a weighted average demand for labour and a weighted average rate of wages; and it is the maladjustment or disequilibrium between these that is disharmony.

It has already been implied that breaches of the equality between the wage-rate and the equilibrium wage are not a sure mark of dis-

harmony. It has in effect been argued by some writers that even when the monetary and wages policies are harmonious, such breaches would occur as a result of movements in wage-rates, and by other writers that they would occur as a result of movements in the price level. Thus, in the first place, it has been argued by Mr. Rowe¹ that workmen as a whole would benefit by keeping wage-rates above the equilibrium level; since the loss that such action would cause them in the form of unemployment would be less than the gain that would accrue to them, in the form of a rise in the equilibrium wage-rate itself, from the resulting improvement in the efficiency of entrepreneurs. It follows that if this stimulus to efficiency were such that the workmen would benefit though themselves shouldering the burden of the unemployment, so too, other things being equal, would the community as a whole; and hence the relationship between wage-rates and the price level would be harmonious. In like manner it has been argued by Mr. Dobb² that the keeping of general wage-rates above the equilibrium level would itself cause that level to rise, owing to the effects it would have in lowering (or in hindering a rise in) the standard of living of the investing classes, and so in lowering (or in hindering a rise in) the supply prices of saving. Apart from the temporary unemployment that it would cause,

¹ *Wages in Practice and Theory*, pp. 228-29.

² "A Sceptical View of the Theory of Wages," *Economic Journal*, December 1929.

this policy would in effect involve a transfer of income from the capitalist classes to the working classes. Notwithstanding the opinion of Professor Robbins, we may therefore conclude that, given the present distribution of the national income, a successful use of the policy would increase economic welfare.¹ In these circumstances, the rise in wage-rates in relation to the price level would be a sign not of disharmony but of harmony. The monetary authorities would not be serving the interests of the community well if they tried to offset the rise in wages by raising the level of prices.

How far these high-wage policies would succeed in fact it is impossible in advance to say. But in an international system the scope for their use by a country acting alone is probably very small.² Nevertheless, to the extent that they are practicable they are quite consistent with harmony—with that relationship between wage-rates and the price level which is best from the point of view of maximising economic welfare.

This fact does not seriously complicate the task of verifying the existence of disharmony statistically. This is so even though both the suggested policies would result in disparities between the

¹ Professor Robbins would regard this deduction as "entirely illegitimate," since it "begs the great metaphysical question of the scientific comparability of different individual experiences" (*The Nature and Significance of Economic Science*, p. 121).

² See Keynes, "The Problem of High Wages" (*Political Science Quarterly*, 1st Number, 1930). See also Beveridge, *Unemployment* (2nd edition), p. 363.

ruling and equilibrium wage levels and hence in some unemployment. If, as a result of their being applied, wage-rates were always (notwithstanding cyclical changes in the conditions of profit-making) kept at about the same height above the equilibrium level, the unemployment that they would cause would be more or less constant. Or if they were applied only when other incentives to efficiency were lacking, and when profits were expanding, the unemployment that they would cause would be greatest when that caused by disharmony was least. It would be greatest during periods of industrial expansion, of booms in trade, when the efficiency of entrepreneurs tends to be below normal and when incomes are expanding; and it would be least during times of depression, when efficiency is already being stimulated and incomes are tending to contract. The effects of disharmony on unemployment are the direct opposite of this. It causes unemployment to be least during times of boom and greatest during times of depression; for booms are accompanied by rising prices and depressions by falling prices. The result is that during times of boom the equilibrium level of wages tends to be above the actual level, and during times of depression to be below it. There is no danger, therefore, that, so far as these two factors are concerned, the effects of harmony in causing unemployment will be attributed to disharmony. In any event, as we shall see later,¹ serious disparities between the

¹ IV. i. 2.

actual and equilibrium wage levels have not, in the past, been caused by movements in the rate of wages.

In the second place, strong arguments have been put forward why, in certain circumstances, there should be changes in the price level.¹ If these arguments are accepted as conclusive, it follows that changes will occur in the relationship between the price level and wage-rates unless wage-rates are altered at once in the same proportion as the price level. It will be argued later that such changes in wage-rates would not be large enough to restore the actual level to equality with the equilibrium level. And it will also be argued that the changes that would be large enough for that purpose would be in the interests neither of labour nor of the community as a whole.

Breaches of the equality between the ruling and equilibrium wage-rates that occur in conditions of harmony must be regarded as the price which the community willingly pays in order to gain some desired end. But breaches caused by disharmony do not arise in this way: they do not confer upon the community more benefit than they inflict loss; and if there existed a reasoned relationship between wage-rates and the price level they would not occur. The main desire at present, however, is not to distinguish those breaches which arise out of disharmony from

¹ See, for example, Robertson, *Banking Policy and the Price Level*, *passim*.

those which do not ; it is to emphasise that in so far as disharmony exists at all, inequality between ruling and equilibrium wage-rates is the result, and that when the equilibrium rate is the lower, the result is unemployment. How to prevent that unemployment is a problem of great importance.

In recent years much has been done towards finding a solution of this problem by writers who have approached it from the side of monetary policy, and who have examined the possibilities of controlling the price level in such a way as to make the equilibrium rate of wages conform to the actual rate. In the present work, therefore, this aspect of the matter will be left out, and the problem will be discussed from the point of view of wages policy.¹ Moreover, a study of the matter from this point of view seems desirable for another reason. A good deal of the criticism directed against the group of writers mentioned is based on the view that they would prefer to adjust the *equilibrium* rate of wages solely because they think that the actual rate is more stubborn. In this criticism it is sometimes implied, and sometimes explicitly stated, that on grounds other than those of expediency, or even on these grounds also, it is the adjustment of the actual rate that is

¹ This aspect has not, of course, been omitted by writers on the trade cycle ; but in their works it has naturally occupied a subordinate place. See, for example, the discussion of it in Pigou, *Industrial Fluctuations*, Part I, Chap. XIX, and Part II, Chap. IX.

to be preferred.¹ This view implies that if the actual and equilibrium rates have been thrown out of adjustment, a movement of the actual rate in the direction of the equilibrium rate would be sure, in all circumstances, to bring the two rates nearer to equality; ² and it also implies that the movement in wages, if at all considerable, would have a very marked effect of this kind, and so would largely restore employment to normal. Clearly, this contention ought to be examined. By adopting as standpoint the relation of wage-rates to the price level, at least a part of the analysis that would be necessary in coming to a conclusion upon it will be undertaken in this essay.

But the main object of the essay is not to compare the relative merits of the policies of controlling the price level and of controlling wage-rates. It is to inquire whether—taking monetary policy as given—it would be *possible*, with economic advantage to the community, to keep the actual

¹ A typical exponent of this view is Mr. Frederic Benham (see his *British Monetary Policy, passim*). Having in his view "shown that Great Britain has needed to reduce wages ever since 1925 to solve her internal problem of unemployment," Mr. Benham suggests that "The most hopeful changes of 1932, more hopeful even than the Lausanne settlement of reparations, have been the considerable wage reductions in Germany, America and elsewhere. Great Britain will not employ her idle men and idle plant unless she follows suit" (*ibid.*, pp. 92-93).

² Mr. Benham argues that the idea that it would not "has proved disastrous in practice and it is false. In the last resort total demand is total supply. . . . If more is produced there is, therefore, a larger final demand" (*ibid.*, p. 94).

level of wages at approximate equality with a fluctuating equilibrium level. To put the matter otherwise, the aim will be to examine the problem of adjusting wage-rates unilaterally.

In discussing how effective an alteration in wage-rates would be in restoring equilibrium, the first and most difficult task will be to find out what are, precisely, the factors on which the effects would depend. This will be done by postulating conditions of disequilibrium and by tracing the effects on employment that would result from a movement in the level of wage-rates. Two different hypotheses are possible. It might be supposed either that the wage level is moved upwards, towards an equilibrium level which is above it, or that it is moved downwards, towards an equilibrium level which is below it. The factors that would be concerned are the same, and from a theoretical point of view the two hypotheses are equally legitimate. At the present time, however, interest is naturally focussed on conditions in which the actual rate of wages is above the equilibrium rate, and in which the relevant movement in wages is a lowering. This, therefore, is the hypothesis that will be adopted. It will be assumed that at the existing wage-rates not all workpeople can find work, and it will be asked what factors determine how the volume of employment would be affected if wage-rates were lowered.

This inquiry will be undertaken in Parts I and II. Part I will be concerned with the factors

that determine how far a given lowering of wage-rates would be effective in bringing the actual rate down to the equilibrium rate, on the assumption that reactions are confined to the particular industry concerned; in other words, it will be concerned with what will be called Particular Equilibrium—with the factors that govern the position of the equilibrium rate in the given circumstances of disequilibrium. Part II will be concerned with the factors that determine how far, as a result of the fall in wages, this position might itself be shifted, and will therefore be concerned with General Equilibrium. These two groups of factors taken together determine how far the given lowering of wages would restore equilibrium.

In Part III, these factors will be considered in relation to different monetary policies—in relation, that is to say, to various degrees of fluctuation, caused or allowed by changes in the price level, in the equilibrium rate of wages. This simply means that an attempt will be made to gauge the strength of these factors in various degrees of disequilibrium. An attempt will then be made to apply the conclusions on this matter to the problem of bringing monetary and wages policies into harmony. Finally, in Part IV, certain parts of the argument of Part III will be verified statistically.

PART I

PARTICULAR EQUILIBRIUM

CHAPTER I

THE MARGINAL PRODUCTIVITY THEORY

I. *The various repercussions caused by lowering wage-rates*

THE scope of this Part and of the next was briefly indicated at the end of the preceding chapter. It is to be supposed that, for some reason such as a fall in the price level, there has occurred a breach of the equality between the equilibrium rate of wages and the actual rate, and that in the resulting conditions of disequilibrium the actual rate is the higher. And it is to be asked what factors determine how far a reduction in wage-rates would diminish the volume of unemployment existing in those circumstances. It will make for a clearer understanding of the procedure to be followed if this brief statement is now filled out.

A lowering of wage-rates means a lowering of costs, and a lowering of costs means that a lower price can be charged for the product. At a lower price, other things being equal, more of the product can as a rule be sold. It therefore appears self-evident that a lowering of wage-rates, which involves a lowering of costs, would stimulate output and employment, and hence that it would

lessen unemployment. But it is wrong to assume that if wage-rates were lowered other conditions *would* stay unchanged. For a considerable lowering of wage-rates in one industry—especially if it is an important industry—is likely to set up an appreciable reaction on employment in other industries; and it is likely that, as a result, there will be some reciprocal reaction on employment in the first industry. Thus when any given industry lowers its wage-rates, general employment will be affected in three ways: first, that industry's own employment will be affected directly, in the manner indicated; secondly, there will be reactions on employment elsewhere; and thirdly, as a result, there will be a further reaction on employment within the industry itself.

But in a *general* lowering of wage-rates this will not be all. This threefold reaction on employment will be exercised by the lowering of the wage-rates not only of one industry but of every industry. The size of each of these three kinds of reactions caused by lowering any particular wage-rate will be other than it would have been had other wage-rates remained unchanged. Hence in order to estimate the change in the volume of employment that will be brought about by lowering any given wage-rate, account must be taken not only of the two indirect reactions (the second and third kinds distinguished above) as well as of the direct reaction, but also of the modifications that will be caused in all three of these by lowering other wage-rates at the same time.

The factors that determine the solution of the problem can therefore be arranged and studied in the following groups: first, the factors that determine how much the lowering of wage-rates by any one industry will increase employment in that industry, on the assumption that there are no perceptible reactions on employment elsewhere, and hence that there are no reactions on the demand schedule for the product (and thus for the labour) of the industry concerned; secondly, the factors that determine the nature and size of these two indirect reactions (other wage-rates being supposed unchanged); and thirdly, the factors that determine how much all of these reactions will be modified by the concurrent lowering of all other wage-rates. As already mentioned, the second and third of these groups of factors will be discussed in the next Part, and the present Part will deal only with the first group. Throughout this Part we shall assume conditions of competition.

In examining this first group of factors there will be two objects: first, to find out what the relevant factors are; and second, to find out, on the assumption that there are no significant reactions on other industries, whether the equilibrium rate of wages in the given conditions is determinate. These objects are important for two reasons. The first is that we wish to know how far a given wage reduction would go in restoring equilibrium. The second is that we wish to know whether it is theoretically possible—

apart from whether it would be socially desirable—to keep the actual wage-rate equal to the equilibrium rate.¹ In order that the analysis may serve both purposes, the question will be put in this form—What factors in the given conditions govern the equilibrium level of wage-rates in any particular industry?

A factor that throws the equilibrium rates of wages, either in individual industries or in industry as a whole, out of adjustment with the actual rates, will set up a whole series of reactions on the demand for labour; for the extent to which it will cause the demand to alter will be different according to the length of time, following the disturbance of equilibrium, allowed for reactions to take place. These reactions may be divided into three main groups:² firstly, those that would occur in the

¹ This second question must be examined before a completely satisfactory solution can be found of the problem how to regulate wage-rates in the best way. Moreover, those who believe that it is possible, by altering wage-rates, to restore employment to normal, without at the same time sowing the seeds of future disequilibrium, assume, either explicitly or implicitly, that the new equilibrium rate of wages is determinate. And it is one of our aims to examine this contention.

² As Marshall says, "The element of time is a chief cause of those difficulties in economic investigations which make it necessary for man with his limited powers to go step by step; breaking up a complex question, studying one bit at a time, and at last combining his partial solutions into a more or less complete solution of the whole riddle. In breaking it up, he segregates those disturbing causes, whose wanderings happen to be inconvenient, for the time in a pound called *Ceteris Paribus*. The study of some groups of tendencies is isolated by the assumption *other things being equal*: the existence of other tendencies is not

“short period,” secondly, those that would occur in the “long period,” and thirdly, those that would occur in the “very long period.”

By the *short period* will be meant that period, following the breach of equilibrium, during which the number of firms in the industry or industries in which the breach initially occurs, and the amount and forms of the factors of production other than labour and working capital in each of these firms, remain practically unchanged. Short-period equilibrium will be reached when, given these conditions, all tendencies for labour to move from one firm or industry to another, and for wage-rates to move up or down, have worked themselves out. When this has happened there will no longer be any workmen unemployed, and no workman will have any inducement to change his job. The *long period* takes into account all reactions that the cause of disequilibrium sets up, except those on the supplies of the factors of production coming into being. It is therefore the period, following the disturbance, during which the total supplies of the factors in existence remain unaltered, but during which all factors (not merely labour) are free to move from firm to firm and from industry to industry, and wage-rates are free to move accordingly. Long-period equilibrium will be reached when all such movements have stopped. The *very long period* takes into account, in addition, reactions on the supplies of the factors

denied, but their disturbing effect is neglected for a time” (*Principles of Economics*, p. 366).

of production forthcoming; it takes account of the functional relationships between the prices paid to the factors and the supplies of them coming into being. Very-long-period equilibrium will exist when such reactions have come to an end. Thus the first period takes account of movements of labour from firm to firm and from industry to industry while the appliances of production remain the same; the second takes account of movements of all the factors, and so concerns the distribution of the existing factors between the various firms and industries; and the third takes account of reactions on the supplies of the factors themselves.¹

II. *Assumptions of the marginal productivity theory*

Now although any given cause of disequilibrium will keep on affecting the height of the equilibrium wage-rates until it has quite worked itself out, and although, therefore, that height at any given time will be governed partly by the long-period effects of previous causes of disequilibrium; yet, since new causes of disequilibrium are coming into play almost continuously, the adjustment of wage-rates to the price level so as to avoid unemployment is mainly a short-period problem; it is the problem of adjusting wage-rates to the height that would maintain equilibrium in the short period. This view, it seems, is not always held;

¹ Cf. Marshall, *Principles of Economics*, pp. 378-79.

for it is sometimes thought that a full answer to the problem is given by the marginal productivity theory. In order to show that this idea is wrong, certain aspects of that theory must be briefly examined. This examination will form the subject of the rest of the present chapter.

(According to the marginal productivity theory, the payment of each unit of a factor of production tends to equal the value of the marginal product of that factor; and the payment to the whole of each factor tends to equal the value of its marginal product, multiplied by the total number of units of the factor employed. As regards wage-rates, the theory asserts that they tend to equal the value of the marginal product of labour, or (if conditions are in stable equilibrium) that they equal that value absolutely.¹ If, given conditions of equili-

¹ This proposition can be illustrated diagrammatically. Thus we can imagine the application of different amounts of labour to a constant amount of all the other factors taken together.

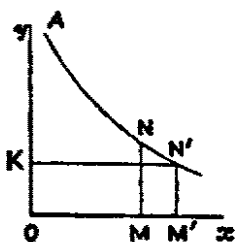


FIG. 1.

Along Ox measure increments of the amount of labour applied to a constant factor, land-capital-organisation. Along Oy represent product. Then the thick line NM represents the addition made to the product by the employment of OM units of labour instead of $OM-1$ units; similarly, $N'M'$ represents the addition made by employing OM' units instead of $OM'-1$, and so on; it being assumed that the forms of the fixed factors are in

every case fully adapted to the number of units of labour actually employed. The curve ANN' consequently represents the diminishing marginal returns resulting from employing varying

brium, the value of the marginal product of labour for any reason falls, wage-rates, according to the theory, will tend to fall to equality with the new value of the equilibrium marginal product—that is, the marginal product of labour when the given available supply is fully employed. The force relied upon to bring about this result is the effort to get work exerted by those thrown out of employment by the breach of equilibrium; the competition of these unemployed workmen bidding down wage-rates till all are reabsorbed into employment.

In order to see how far this theory is true of actual conditions, it is necessary to see in what hypothetical conditions equality between a factor's rate of pay and the value of its marginal product would necessarily be precise. The theory does not assert that this equality is precise in reality; it merely asserts that it *tends* to be precise. This signifies that the statement of equality is true to the extent that actual conditions conform to these hypothetical conditions. It also signifies that, with the passing of time from the occurrence of a change in either the rate of pay or the value of

amounts of labour in conjunction with a constant amount of land-capital-organisation. When OM' units of labour are employed, the marginal product is $N'M'$ and, since on the assumptions made all units of labour are interchangeable, total wages are represented by the rectangle $KN'M'O$. The figure AKN' represents the remuneration, shown residually, of the constant factor, land-capital-organisation. (Cf. Clark, *The Distribution of Wealth*, p. 201.)

the marginal product of a factor, the actual conditions that are relevant come to conform to the hypothetical conditions more and more closely. But only if they conform to those conditions absolutely—only if the basic assumptions of the marginal productivity theory are perfectly true in reality—will the equilibrium rate of wages in actual conditions be the value of the marginal product of labour. Otherwise the value of the marginal product will only *tend* to become the equilibrium rate, and in the meantime that rate will be determined by other considerations. In later chapters an analysis will be made of what these other conditions are; and the remainder of the present chapter will be confined to a study of the assumptions of the marginal productivity theory—to a statement of the conditions in which the equilibrium wage-rate is the value of the marginal product of labour.

These assumptions are five in number, and are as follows:—

(i) In the first place, competition between employers for workmen and between workmen for employment is supposed to be perfect. In so far as there are any monopoly elements, the statement that wage-rates equal the value of the marginal product of labour only tends to be true; it tends to be true because with the passage of time restrictions on competition are apt to disappear. The theory presupposes that it is possible for any one workman to replace any other without friction; it presupposes also that both employers

and workmen know what the conditions are elsewhere, and that they can at once act upon their knowledge.

(ii) In the second place, the marginal product of labour is either the increase in output that would be caused by adding one more unit of labour to the total, or it is the decrease that would be caused by taking one unit away. But the whole of this net change can be attributed to the marginal unit of labour only if the total supply of the other factors remains the same. This is so whether it is desired to reckon only the marginal product of the total amount of labour available, or that of each of the possible smaller amounts as well.¹ Thus the second assumption of the marginal productivity theory (as applied to labour) is that when the amount of labour is varied, the supplies of the co-operant factors remain unchanged.²

(iii) In the third place, it is assumed that, while the co-operant factors are fixed in amount, the forms they take can be altered, and that they always take those forms which enable them to work best with the particular amount of labour employed.³ The amount by which the output would be increased by having one more unit of

¹ In theory, there are as many different-sized total amounts of labour possible as there are units of labour available; and thus we can imagine a whole marginal productivity curve, as in Fig. 1.

² This assumption refers to the supplies in industry as a whole, not necessarily to the supplies in a particular industry. See the reference to this under the third assumption (footnote 3).

³ Cf. Clark, *Distribution of Wealth*, p. 116 and pp. 159-60.

labour, or the amount by which it would be decreased by having one unit less, can then be rightly looked upon as the product of that unit. Further, all the units of labour are supposed to be alike and interchangeable. Hence when any given amount of labour is being employed, all units of it have the same productivity and get the same wage. Fig. 1 does not show that the marginal unit (at any point) is less productive than intra-marginal units are; it shows that every unit is less productive than it would be if there were fewer units.¹

If it were not for this condition, the marginal product of labour could not be found out in the above way—by what is known as the method of “imputation.” It could not be said that the whole of the difference in output was due to the marginal change in the amount of labour, since that would not be the only change. The change in labour would mean that the fixed co-operant factors would be worked worse or better than before. Thus if a unit of labour were taken away, the bits of the other factors used by it would be left idle or nearly idle; and if a unit were taken

Even if in the individual industries the “technical coefficients” of production are fixed, this third condition will be satisfied so long as, firstly, the factors of production are used in unlike proportions in the different industries, and secondly, they are free to move from industry to industry. Cf. Hicks, “Marginal Productivity and the Principle of Variation” (*Economica*, Feb. 1932).

¹ Cf. Carver, *Journal of American Economic Association*, 1902, p. 147.

on, bits of the other factors formerly idle or nearly idle would be put to work. Hence part of the difference in output would be the product not of the marginal unit of labour but of these bits of the other factors. Only if, when the amount of labour is altered by a unit, these co-operant factors undergo a metamorphosis which fully adapts them for working with the amount of labour then employed, will the change in output be a true measure of the marginal product.

It is sometimes tried to prove that the theory is therefore unsound. Thus Mr. J. A. Hobson says that, even in a state of "complete fluidity" of the factors of production and no shortage of any factor, "every marginal unit would be composed of all the factors in such wise that the hypothetical elimination of any one of these would sterilise to an unascertainable extent the others."¹ However true this statement may be of actual conditions, it overlooks the assumptions on which the theory is grounded and therefore misses the mark. It may be answered that a theory grounded on such assumptions is not likely to be of much help in solving practical problems. But that is quite another thing, and it will be dealt with later.²

¹ See *Journal of American Economic Association*, Sept. 1904, p. 455.

² Anyhow, it is not Mr. Hobson's point. His grievance against the marginal productivity theory seems to arise out of misunderstanding; for he seems to think that there is an economically best way of blending the factors of production so as to obtain a given output. But the blend that is best economically, given that the factors can change their forms, depends on

(iv) In the fourth place, in finding out the marginal product of labour by altering the amount employed, it is assumed that the part added or taken away is a very little bit of the whole. Otherwise there would be the same trouble as before. Part of the difference in output would really be the product not of the unit of labour but of the other factors; since if the unit were a fairly large part of the whole, a unit taken on would mean that the other factors would be worked much harder, and a unit put off would mean that they would not be worked nearly so hard. We might even think of the whole of the labour as being put out of work. The alteration that this would cause in the product would be the difference between the whole output and no output. But it would be wrong to look upon the whole output as therefore being the product of labour. All that has to be done to prove this is to imagine the withdrawal, not of all the labour,

their comparative costs. And in trying to explain the forces governing distribution, these must not be taken as given.

Mention may here be made of a similar criticism by Dr. Valk. He argues that in fact there are "only a few expedient methods of co-ordination of the different agents of production" (*Principles of Wages*, p. 80). Hence all the factors could not be paid according to their marginal products, as reckoned by the method of imputation, since the total amount produced would not be great enough. This, also, is in effect a criticism of the usefulness of the theory, not of the logic. For if time is allowed for the factors to take on new forms, the ways in which they could be combined, even in the separate industries, would be innumerable. But even if this could be shown to be wrong, the theory would not necessarily thereby be proved invalid. (Cf. Hicks, *ibid.*)

but of, say, all the capital. That, too, would cause the output to be reduced to nothing (or to almost nothing). But plainly the whole output cannot at one and the same time be the product of labour and of nothing else and also the product of capital and of nothing else; and just as plainly, it cannot all be given as payment both to the labour and to the capital. This difficulty arises because labour is supposed to be made up in such large bundles—or even that it is made up in such a huge single bundle—that the withdrawal of a bundle would leave the other factors partly or wholly barren. Only if the bundle, or marginal unit, of labour is a negligible part of the total will this difficulty not arise.

(v) As we have seen, the amount of the co-operant factors must be constant. At the same time, each hypothetical change in the quantity of labour must be accompanied by such a re-adaptation of these other factors that they may yield the largest output possible for them with the quantity of labour employed; it being only their amount that is constant. But there can be no hope of keeping this amount constant unless it is measurable. And it will be measurable only if unlike parts of unlike factors can be reduced to some kind of uniformity—only if there is some unifying principle underlying the many differences. Thus, in the fifth place, it must be assumed that the diverse co-operant factors can be expressed in terms of some one thing.¹

¹ Cf. Wicksteed, *Co-ordination of the Laws of Distribution*, p. 32.

The different factors are alike in having value in terms of money. They may therefore be stated as an amount of value; and a constant amount of them will be a constant amount of their value. This is a way out of the difficulty. But it is a way out only in certain conditions. For in following this plan care has to be taken—since the marginal product of labour is an amount of output—to see that the given total value, which is the productive power in terms of money, shall always stand for the same productive power in terms of goods. It will do this if the two following conditions are satisfied, and these two conditions are therefore subordinate assumptions of Assumption (v).

(a) Firstly, the community's demand schedule for real income, stated in terms of the efforts and sacrifices needed for getting real income, must be given; throughout the whole series of marginal changes in the amount of labour it must stay the same. Otherwise the derived value of a given amount of productive power (even the derived value of the same embodiments of it) would alter. Thus, after the change, the given sum of money would buy a different amount of productive power from what it would have bought before; and hence the amount of the co-operant factors would not be constant.

(b) Secondly, before reckoning up the constant sum, care must be taken to exclude all value that is in any way dependent on monopoly. In practice, however, there is always an element of

monopoly; for once waiting and risk-bearing have been embodied in definite forms, they cannot, when circumstances change, be at once disembodied; nor, when circumstances warrant it, can other waiting and risk-bearing be at once turned into these forms.¹ Hence in the meantime, the value of particular embodiments of waiting and risk-bearing may be unequal to that of the amount of free waiting and risk-bearing needed for making others like them.

These two conditions will not be satisfied, unless either there are no frictions whatever, or time is allowed for them to be overcome before new causes of disequilibrium come into play. From this it follows that by keeping a constant *value* of productive power we should be keeping a constant *amount* of productive power only if the value was that which would rule in a stationary state. In this stationary state the supplies in being of all the factors of production are fixed, but the units of each factor compete, not only among themselves, but also against the other factors, and these conditions result in equilibrium; they are therefore the conditions of our long period.²

The assumptions on which the marginal productivity theory is based may now be briefly restated. They are: firstly, that there is free competition; secondly, that the supplies of the factors of production other than labour are fixed;

¹ Cf. Marshall, *Principles of Economics*, p. 376.

² See above, p. 21.

thirdly, that the forms taken by these factors can be readily altered (in other words, that for industry as a whole there are no fixed "technical co-efficients"); fourthly, that the marginal unit of labour is indefinitely small; and fifthly, that the co-operant factors can be measured as if they were homogeneous. Hence the theory cannot be expected to hold true in the short period, because the very meaning of this term—viz. the period, following the upsetting of normal equilibrium in any industry, during which the number of firms in that industry, and the amount and the forms of the factors other than labour held in each of these firms, remain fixed—is a denial of all five of its assumptions. Those assumptions give rise to the conception of a stationary state, in regard to which the theory is strictly true. This notion gives the position of the marginal product at a point of time; it takes no account of movements that would occur in that position if changes in the supplies of the different factors were allowed to take place.¹ There is, therefore, no fixed point of the marginal product of a factor in the "very long period"; there is a line of its trend through time. It is always true that wages tend to equal the value of the marginal product of labour; for the conditions that exist when equilibrium is upset are, with the passing of time, slowly transformed, until at last they approximate to those assumed in the theory. But long before that

¹ Of course, such changes would cause movements in the whole of the marginal productivity curve.

stage has been reached, new causes of disequilibrium are certain to have shown themselves. Thus, as Clark pointed out,¹ wages are always trying to catch up to the value of the marginal product—whether this is becoming greater or smaller—without necessarily ever succeeding.

III. *Wrong inferences from the marginal productivity theory*

Marginal productivity is thus a static conception; the marginal productivity theory is strictly true only in the "long period." Yet if it is to be of use in solving practical problems, it must be made able to work in dynamic conditions. The problem of adjusting wage-rates to the price level is mainly a short-period problem; and, as we have seen, the assumptions of the theory do not fit the conditions of the short period at all well. We must go on, therefore, to study the forces that determine the equilibrium level of wage-rates in the short period, a study that it is hoped will shed light on the problem of how to adjust wage-rates to the price level. But before doing this it may be well, in bringing the present chapter to an end, to point out that this study will show that three inferences often drawn from the marginal productivity theory are false. These inferences are as follow.

(i) The first is that wage-rates are *always* equal to the value of the marginal product of labour, in

¹ *Distribution of Wealth*, pp. 405-6.

the sense that they are always precisely equal to the value of the marginal product of the labour actually at work. For if the value of this marginal product is for any reason below the ruling wage-rate, workmen will be put out of work. The more men thus put out of work, the larger, other things being equal, will be the marginal product of those left. And the inference is that just so many will be put off that the marginal product of the rest will be equal to the ruling wage-rate. But this inference is wrong. Only if conditions became quite identical with those of the stationary state (wage-rates still not yielding) would unemployment grow to precisely that size; and equality between wage-rates and the value of the marginal product would be restored only gradually, as the conditions merged into those of the stationary state. Till that position was reached, unemployment would go on changing. We shall thus reach the conclusion that a given cause of disparity between wage-rates and the value of the equilibrium marginal product of labour—that is, the marginal product if all available workmen were employed—would affect unemployment to a different extent according to the length of time allowed for reactions; for as the reactions take place the height of the equilibrium wage level slowly moves upwards or downwards. It follows that if wage-rates were always to be kept at exactly the equilibrium level, the appearance of a cause of disequilibrium only once would make it necessary to change wage-rates not only once but

many times, as with the passing of time conditions slowly changed.

(ii) The second wrong inference is that, disequilibrium having occurred, the right way to get rid of the resulting unemployment is to lower wage-rates till they equal the new value of the equilibrium marginal product of labour; since the cause of the unemployment is that wage-rates are too high. But it is equally arguable, *a priori*, that the trouble is that the value of the marginal product is too low, and that this should be raised. The right inference is that equilibrium should be restored in the least costly way, whether by lowering wage-rates or by raising the value of the marginal product of labour. It is one of the aims of this essay to find out which in general is the least costly way.

(iii) The third inference is that if, nevertheless, it is decided to restore equilibrium by lowering wage-rates, it will be necessary to lower them to precise equality with the value of the equilibrium marginal product of labour. This inference is wrong, because the equilibrium level of wage-rates is *not*, in the short period, the value of the marginal product. The reasons why these inferences are wrong will be made clearer as the following analysis proceeds.

CHAPTER II

EQUILIBRIUM IN THE SHORT PERIOD

THE way is now clear for our proposed examination of the forces that determine how much a particular industry, other things being equal, would need to lower its wage-rates—in order by so doing to reach short-period equilibrium—when a fall of a given size in the demand for the commodity that it produces has caused a fall in its demand for labour, and hence in the equilibrium level of its wages. The fall in the demand for the commodity may be due either to general monetary factors that affect the prices of all commodities, or to special factors that affect the price of only the particular commodity; for from the present point of view the way in which the fall in the demand is caused does not matter.

I. *The conception of a "short-period marginal product of labour"*

In the conditions existing just before the fall in the demand occurs, there will be a state of at least temporary equilibrium, in the sense that at the existing wage-rates, other things being equal,

employers would make a net loss by either putting men off or taking men on. There will also, in relation to those conditions, be a rate of wages that would yield long-period equilibrium; and in order to make the argument short, it will be assumed that it is this state of long-period equilibrium that actually, at the time, exists; it will be assumed that the rate of wages is equal to the long-period value of the equilibrium marginal product of labour.

When, owing to a fall in the price of the given commodity, a disparity arises between the wage-rate and the value of the equilibrium marginal product of the labour producing that commodity, the marginal product, though physically the same, will be worth less to the entrepreneurs. Since, *ex hypothesi*, it only just paid to employ it before the breach of equilibrium, it will not pay to employ it afterwards; net profit, other things being equal, will be increased by curtailing employment. Now it may be presumed that entrepreneurs prefer a large income to a small income, and that therefore, other things being equal, they aim at maximising profits. Hence employment will, in the circumstances, be curtailed. In the same way, the fall in the price of the commodity will cause the marginal products of the other factors also to be worth less; and if the marginal units of these factors could be dismissed without adverse effects on profits in the future, they would be dismissed too. But here the entrepreneurs are at a dis-

advantage; for if they do dismiss part of these other factors, they will be lessening their future productive capacity. In the short period, the only way in which they can alter their profits by changing the size of their output is by working their given equipment at a different rate; the only way is by altering the volume of their employment. In the given conditions of disequilibrium postulated, this tendency to alteration in the volume of employment will be a tendency to curtailment. We may provisionally suppose that before the competition of the unemployed to get work causes the wage-rate to begin to fall, this tendency to curtailment of employment has reached its limit. This implies that so much labour has been dismissed that, in the given conditions, including the level of wages, entrepreneurs are maximising their profits or are minimising their losses.¹

¹ It should be noticed that on the marginal unit of labour kept at work there may, in fact, be a present loss. For the limit to the curtailment may depend less on what is the most profitable output in the present than on the size of the labour force that is needed to keep the equipment in a state of efficiency; and in that case the present loss may be suffered in order to prevent a larger potential loss in the future. This is to some extent true of shipping at the present time. On certain voyages shipowners consistently incur a prime loss; their receipts do not cover the money outlay which these voyages involve. They put up with this state of affairs because the alternative—which is to lay the ship up—would involve an even greater loss. And there is no reason why they should not go on doing this indefinitely; for the loss can be made good out of the interest on their government securities. In this state of affairs a lowering of wages

In considering how far in these circumstances a given reduction in wage-rates will cause employment to increase, it must be observed that in the short period some of the entrepreneur's money expenses of production are fixed in amount; these expenses are independent of the size of the current output, and have to be paid solely in order to maintain the firm as a going concern at its existing productive capacity—that is, with its existing outfit of appliances and its existing knowledge of processes. There are two reasons for the existence of such "fixed money expenses." The first and most important is that in the short period the forms of some of the factors of production are fixed; while still liquid, as it were, these factors have flowed along certain channels and have there frozen. The second reason is that the government finds it easier and more convenient to levy rates on a firm's whole undertaking than on each unit of output. No doubt it would be possible to arrange some of these overhead expenses—for example, rates—in such a way that they would vary with output and so be changed into prime costs. But the point that matters at present is that there are, in fact, some money expenses that in the short period are fixed, and have to be paid regardless of the size

would probably not affect the volume of employment at all; since while it is certain that the shipowner's prime loss on the marginal unit of labour would be diminished, it is not certain that it would be changed into a prime profit.

of the output. The chief of them are rent, rates, salaries, insurance, interest on loans and debentures, and depreciation on capital. Some of these, of which depreciation of plant may be taken as an example, are partly prime costs, varying with the size of the current output; but we are at present concerned with only that part of them which is independent of the current output. Even in the short period, entrepreneurs are sometimes able to get their overhead expenses reduced.¹ But *ex hypothesi* they cannot do so by altering the amount of output that they produce with their given equipment; in so far as they wish to lower their costs by this means, while keeping their equipment intact, they will look only to prime costs.

Let us suppose for the moment that the only prime cost is wages. Then, allowing for the risk of "spoiling the market"² and for the need to keep their concerns in working order, entrepreneurs will take on labour up to the point at which, with their given equipments, they are maximising their prime³ (and therefore total) profits. This means that they will take on labour up to the point at which the taking on of one unit more would cause the output of the commodity to increase—or the putting of a unit off would cause it to decrease—by that amount

¹ An example is afforded by the de-rating provisions of the Local Government Act of 1929.

² Cf. Marshall, *Principles of Economics*, pp. 374-75.

³ That is, proceeds of sale less prime costs.

which, when the price had been fully readjusted, would be equal in value to the lowered wage-rate. Thus in trying to find out what factors determine the equilibrium level of the particular industry's wage-rates in the short period, we shall have to find out what factors determine the value, not of the marginal product of labour, but of the difference in output that would be caused by a marginal change in the quantity of labour used to work the given equipment. This fact gives warrant for the conception of what may be called the "short-period marginal product" of labour.¹

¹ It should be observed that in the opinion of Mr. J. R. Hicks, "it is very doubtful if this conception can be given any precise meaning which is capable of useful application" (*The Theory of Wages*, pp. 20-21). In giving his grounds for this view, Mr. Hicks says: "The ambiguity of this conception comes out clearly when we realise that the difference to total production made by the addition of a single man with form and quantity of co-operating capital supposed unchanged will be much less than the true marginal product (form supposed variable); while the subtraction of a single man when the forms of capital have been adjusted to the previous supply of labour will give a difference in total production much greater than the marginal product" (*ibid.*, p. 20, footnote 2). But this is a misunderstanding; for, as we shall see later (in Chap. IV of this Part), *when the equipment is given*, the addition of the n th unit of labour to the quantity at work would cause output to increase by the same amount as the subtraction of the n th unit would then cause it to decrease. Further, Mr. Hicks's criticism of the conception is beside the point. For to put the matter as he does is to suppose that in both cases—both in taking on and in putting off labour—we start from a position of long-period equilibrium, in which the whole of the given quantity of capital (if not the whole of the available labour!) is at work. And that is to assume away the very problem—that of unemployment—in which the conception promises to be of most use.

This conception of a short-period marginal product must be clearly distinguished from that of a true, or long-period, marginal product; it is not the marginal product of the marginal productivity theory. In that theory care is taken to see that no part of the product of the constant factors is imputed to the marginal unit of labour; the theory is so formulated that it relates only to conditions in which all parts of the constant factors will be worked whether the marginal unit of labour is employed or not. But in finding the marginal product in the short period this cannot be done. For in the short period the removal of a unit of labour would cause a part of the given equipment hitherto at work to become idle, and the addition of a unit would cause a part of it hitherto idle to be set to work. Thus the removal of a unit of labour would cause the given equipment to become less productive than it would have been otherwise, and the addition of a unit would cause it to become more productive. Nevertheless, we may provisionally regard the whole of the change in output resulting in the short period from a marginal change in the quantity of labour as the product of the marginal unit; that is, we may regard it as the "short-period marginal product" of labour. For though it may be partly the product of the given appliances, in the sense that it may be partly the result of their being worked at a different rate; yet (if the only prime cost is wages) it is wholly the product of the marginal

unit of labour in the sense that if that unit were not employed none of it would be produced at all; and from the point of view of whether the unit will be employed, it is this sense that is important.

II. *The "marginal composite product" and the "marginal net product of labour"*

But since, in fact, wages are not the only prime cost, our conception of the "short period marginal product" of labour must be elaborated. In this connection account must be taken of two other prime factors—that is, of two other factors whose amounts are variable in the short period. The first is that of working capital, and is made up of the costs of the raw materials¹ and of the funds with which to pay for them and the labour; other things being equal, this cost varies with the elasticity of the supply of short loans. The second is the short-period cost of enterprise; this consists of the costs of organisation and of the bearing of risk. It is a prime cost because, though in the short period the presence of the entrepreneur in a particular industry is certain, the amounts of work and risk that he actually undertakes are variable; other things being equal, they vary with the size of the current output. Because the forms of the constant factors are fixed, there is little scope in the short

¹ We may for convenience include in raw materials such things as light, power and fuel, and so regard working capital and enterprise as the only prime factors other than labour.

period for varying the amounts of these other prime factors co-operating with, and hence taken into employment at the same time as, a marginal unit of labour; in most industries technical conditions are such that an increase in the quantity of labour involves *some* increase in the other prime factors also. Thus the net addition to the output caused by taking on a unit of labour (the equipment being given) must be attributed not solely to the unit of labour, but to that and to the amounts of the two other prime factors taken on with it; since it is the composite product of all three of these prime factors. This net addition to output will therefore be called the "*marginal composite product.*" By regarding each possible amount of labour marginally, we can get the "*marginal composite product*" expressed in the form of a schedule or a curve. Hence in order to find the "*short-period marginal product*" of labour, it is necessary to subtract from the "*marginal composite product,*" at each point, the part of it that is to be ascribed to the allied increases in the other prime factors, working capital and enterprise; the "*short-period marginal product*" of labour (which for shortness will henceforth be called the "*marginal net product*") is the amount then left over.

In trying to find out how much of the "*marginal composite product,*" at each point, actually is to be ascribed to the allied increases in working capital and enterprise, we cannot use the method of imputation. This is so because the sizes of

those increases are to some extent settled by technical conditions. But they are not in that way settled rigidly; the principle of substitution also plays a part. For in increasing his output in the short period (with his given appliances) the entrepreneur has some choice of method; he has some choice regarding the proportions in which he will increase the various prime factors. However, in so far as the sizes of the allied increases in working capital and enterprise are not governed by technical considerations (that is, in so far as the entrepreneur has such a choice in fact) they are governed by considerations of relative cost. Hence given the short-period supply curves of working capital and enterprise—at any given level of wages the supply prices of labour are constant—and given the technical conditions, the sizes of those increases, though not necessarily the same at all points, are determinate; in the given conditions they are variable functions of the amount of labour.

Now we have seen that the marginal composite product can be calculated by the method of imputation; and we have also seen that the relevant amounts of the co-operant prime factors are stated in the above functions, and that their supply prices are stated in the supply curves. Therefore the "marginal net product" of labour, at each point, is to be found by taking from the marginal composite product, at the same point, a quantity whose value at the price per unit that would rule for the amount of output then

being produced, would be equal to these extra amounts of working capital and enterprise multiplied by their supply prices; the marginal net product, at each point, is the part of the marginal composite product that is then left over. The value of marginal net product (as thus determined) of the whole amount of labour available is what wage-rates in short-period equilibrium will equal;¹ this, with certain exceptions,² will be the short-period equilibrium wage so long as it is higher

¹ As we have seen above (p. 28, footnote 2), it is sometimes argued against the marginal productivity theory of distribution that it would be impossible to pay all the factors of production according to their marginal products, as more would have to be distributed than had been produced. It is generally agreed that against the formal correctness of the static conception of the theory this criticism is powerless. (For mathematical proof, see Wicksteed, *Essay on the Co-ordination of the Laws of Distribution*, and Hicks, *The Theory of Wages*, Appendix.) While admitting this, Dr. Valk argues that "as soon as we reckon with the existence of more or less durable capital goods and of only a few expedient methods of co-ordination of the different agents of production, the objection that the withdrawal of a unit of one factor would do some damage to the productivity of the other factors regains its power . . ." (*Principles of Wages*, p. 80). At first sight, therefore, it might appear that against our conception of a short-period marginal product the above criticism is valid. But this is not so. For the fact that according to this theory labour is not, in the short period, paid at a rate equal to the value of its "true" marginal product is not a disproof of the theory, since the same is true in the short period of the other factors. Thus the factors whose amounts in the short period are fixed are paid rates determined according to the conditions of the previous equilibrium; and the rates of pay of the three prime factors are determined in the way described in the text.

² These exceptions will be discussed in the next chapter.

than the wage that workmen look upon as the equal, account being taken of the advantages and disadvantages of work and idleness, of what they could get, if unemployed, in the form of unemployment insurance and other benefits.

The force that, in the conditions of disequilibrium assumed, will drive competitive wage-rates down to this short-period equilibrium level is the effort to get work exerted by the unemployed. As wage-rates are thus driven downwards, there will be established at each new rate—if it lasts long enough for the reactions to take place—a state of temporary equilibrium, in which entrepreneurs are employing such a quantity of labour that their profits are the largest possible in the conditions then existing; and they will be doing that only if, at each new wage-rate, they increase employment up to the point at which the net addition to the output that would be caused by taking on a further unit of labour is equal in value—when the price of the commodity has been lowered enough to equate the demand and supply—to the lowered wage-rate. This means that at each new hypothetical wage-rate the volume of employment will eventually swell to the level at which the marginal net product of the amount of labour then being employed, multiplied by the demand price per unit for the quantity of output then being produced, is equal to the wage-rate. Until all the unemployed have again found jobs (or till a rate is reached below which they will not offer to

work) this downward pressure on wage-rates will continue; it will therefore continue till wage-rates have fallen to equality with the value (at the readjusted price for the commodity) of the marginal net product of the supply of labour available—that is, till they equal the *equilibrium* value of the *equilibrium* marginal net product of labour.

Thus in expanding employment because of a fall in wage-rates, entrepreneurs will take account of reactions, due to the expansion in output, on the price of the commodity; the fall in price will cause the increase in employment to be less than it would be otherwise. Such changes in price, however, will be taken into account only as a secondary reaction. For under conditions of competition the individual entrepreneur, in deciding how much to increase his output, is not concerned with the reactions that he will thus set up on the price of the commodity in the future; since his output is supposed to be so small compared with the total supply that a change in it alone would not affect the price perceptibly. But he always is concerned with reactions on the price that have already, at the time, resulted from changes in his own and other entrepreneurs' output in the past; and in the conditions assumed, not only one but every entrepreneur will be induced by the fall in wage-rates to take on more labour. It follows that the reactions on the price will, in fact, be perceptible, and that their size will therefore be a

factor in determining how much the volume of employment will increase.

We now see that the amount by which an industry would increase its own employment in the short period by lowering its wage-rates in a given measure depends, other things being equal, on two general factors: firstly, on how much, as the quantity of labour employed is increased, the marginal net product of that changing quantity grows or shrinks; and secondly, on how rapidly the demand price for the commodity falls as the supply is enlarged. That is, it depends, other things being equal, on the inclination of the marginal net productivity curve of labour in that industry, and on the elasticity of the demand for the commodity; for these are the factors that govern the elasticity of the industry's demand for labour.

III. *The quantity of labour to be reabsorbed by the depressed industry*

But when we wish to find out, not how much employment in the particular industry will increase because of a wage reduction of a given size, but how far wage-rates will have to fall in order to reach the short-period equilibrium level, this is not the whole of the matter. For account must then be taken not only of the elasticity of the demand for labour in that industry, but also of the supply of labour to be reabsorbed into employment there. And the size of this supply will depend on two things: first, on what quan-

tity of labour in the industry has been thrown out of work by the original breach of equilibrium, and second, on how much of this displaced labour must be again taken on, in short-period equilibrium, by this particular industry itself.

The first of these two things—that is, the quantity of labour thrown out of work by the fall in the demand for the commodity—itself depends on two other things. Firstly, it depends on how large the fall in the demand for the commodity is; for, other things being equal, this determines how large a fall there will be in the demand price of labour per unit for the various amounts of labour that might be employed. But secondly, given the size of this fall, the amount by which the volume of employment will shrink will depend on how elastic is the demand;¹ it will therefore depend on the

¹ Along Ox measure amounts of labour, and along Oy measure price. Let the demand curve for labour in its old and new positions be represented respectively by DD' and dd' , and let the horizontal straight line WW' represent wage-rates. Then the volume of employment will fall from OL to Ol , and the volume of unemployment will be LL . Given the size of Tt (*i.e.* the vertical fall in the demand curve), Ll will be greater the flatter is the demand curve. It should be observed, however, that the demand curve is liable to fall still

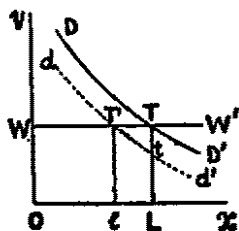


FIG. 2.

further if conditions of disequilibrium are allowed to last for a long time. This is especially so if the depression is general. See below, I. iv. 1.

slope of the marginal net productivity curve of labour and on the elasticity of the demand for the commodity; since, as we have seen, these are the factors that determine how elastic the demand for labour in the industry concerned will be. Thus when the demand for the commodity falls, labour will be put off up to the point at which entrepreneurs would not increase their profits by putting off a unit more. In the state of temporary equilibrium that we have supposed will be reached before the fall in wage-rates begins, the value of the marginal net product of the labour still employed will therefore be equal to the unchanged wage-rates; in this state each unit of labour will be paid a wage equal to the value of that amount of the commodity by which the removal of a unit of labour would cause the total output to be reduced.¹

We may now turn to the second part of the

¹ But it may be objected that part of the reduction in output that is thus attributed to the marginal unit of labour, through its withdrawal, is really the product of the fixed factors, which the withdrawal of that unit of labour puts partly out of action, and that since the entrepreneur is already paying the fixed factors for their share of the work, he will, for this part of the output, be paying twice over. While, however, it is true that the product concerned is not the long-period marginal product of the quantity of labour still employed, this fact is irrelevant. The entrepreneur's choice is between keeping a man at work and dismissing him. Which course he will adopt depends, other things being equal, on which is the more profitable; and in deciding this he will naturally take into account the value of the whole amount by which he would reduce his output by removing the workman.

question and ask what are the factors that determine how much of the labour thrown out of employment by the fall in the demand for the commodity must be re-employed, in short-period equilibrium, in the depressed industry itself. All of it will have again to be employed there unless some of the workmen both can and will shift to jobs in other industries. In the first place, whether they *can* shift or not will depend on whether or not there are obstacles to their mobility. The short period therefore falls into two parts; during the first part workmen cannot, because of obstacles, shift to other industries, and during the second, because the obstacles have then been cleared away, they can shift.¹ Any factors that lessen the mobility of labour between industries thereby lengthen the first part of the short period, and so cause the number of unemployed that the depressed industry itself has to employ again to be greater than it would be otherwise; and in this way, by making the equilibrium wage-rate lower than it otherwise would be, they make it harder for the depressed industry to reach a condition of short-period equilibrium.² Thus the first of the things that determine how much of the dismissed labour will have to be re-employed in the depressed

¹ If the obstacles to the mobility of labour are very stubborn, the first part of the short period may be equal to the whole.

² It should be observed that the mobility of labour has been greatly hampered in the post-war period by certain new forces bearing on wages policy. See below, IV. i. 1.

industry is the extent to which labour is mobile. But in the second place, when labour can shift—that is, when we are concerned with the second part of the short period—the number of the unemployed that *will* shift to other industries will depend on how many of them can get jobs there at wages a little above what they could get in the depressed industry; and this will depend on how elastic the demand for labour is in the depressed industry compared with how elastic it is in the rest of industry.

IV. *Conclusions*

The various factors that determine how much the wage-rates in the depressed industry will have to fall to reach the short-period equilibrium level can now be brought together. The first is the volume of unemployment; and that, as we have seen, is governed by the size of the fall in the demand for the commodity and by the elasticity of the demand for the labour producing it. The second is the extent to which the men thrown out of work by the fall in the demand can shift to other industries; and that depends on how strong the hindrances are to the mobility of labour. During the first part of the short period, while these hindrances cannot be overcome, the amount by which the wage-rates must fall to reach the equilibrium level in the conditions then existing depends wholly, given the volume of unemployment, on the third factor, the elasticity of the demand for labour in the

depressed industry; and this, in turn, is governed by the elasticity of the demand for the commodity, and by the rate of fall in the marginal net product of labour in that industry as the quantity of labour employed there is increased.¹ Finally, in the second part of the short period, when the hindrances to the mobility of labour have been cleared away, the required fall in wage-rates in the depressed industry, given the quantity of labour originally thrown out of work, depends on the elasticity of the demand for labour not only in the depressed industry, but also in the rest of industry.

In later chapters these factors will be analysed; for when discussing how much a lowering of all wage-rates would alter the volume of employment in a general depression, it will be necessary to know, firstly, how the marginal net productivity curve of labour in a representative industry is inclined, secondly, how elastic the demand is for the products of the more severely depressed industries, and thirdly, whether or not there are any new factors making it harder for labour to shift from these industries to other industries. The first of these questions will be examined in Chapter IV of the present Part, while the other two will be left till we come to discuss the effects on employment that would result from lowering wage-rates in general.

¹ For evidence that the marginal net productivity curve will be inclined negatively, see below, I. iv. 3 and 4.

CHAPTER III

INDETERMINATENESS OF SHORT-PERIOD EQUILIBRIUM WAGE-RATES

IT is usually supposed that under conditions of competition there is only one level of wage-rates that, in any given circumstances, would result in equilibrium, and that this equilibrium wage level is determinate. In discussing the marginal productivity theory, we have seen that as regards wage-rates in the long period this is true. And from the statement that competition in a depressed industry will keep on forcing wage-rates down till they are level with the value of the equilibrium marginal net product of labour, the impression may have been gathered that it is also true of wage-rates in the short period. But for two reasons it must not be taken for granted that this is so. In the first place, even if the equilibrium wage-rates must always be precisely equal to the value of the marginal net product of the available amount of labour, it does not follow that they will therefore be determinate; for it may be that the marginal net product is itself indeterminate. And in the second place, it does not follow that because wage-rates cannot be in equilibrium if they are

above the value of the equilibrium marginal net product of labour, they cannot be in equilibrium if they are below it. Thus before analysing the factors that determine how much the wage-rates in the depressed industry will have to be lowered in order to restore equilibrium, we must examine this question whether or not there is only one particular level of wage-rates that would result in short-period equilibrium—that is, whether the level of wages is determinate or not. For this purpose it will be necessary to find out two things : first, whether the marginal net product of labour is, or is not, determinate in all circumstances ; and secondly, whether or not wage-rates, if they are to be in short-period equilibrium, must necessarily be equal to the value of this marginal net product. These questions will be examined in the present chapter.

I. *Indeterminateness of the marginal net product of labour*

The marginal net product of labour will be definite only if the amount that has to be taken away from the marginal composite product, as the supply prices of the amounts of working capital and enterprise added at the same time as the marginal unit of labour, is definite also. If the costs of these other prime factors are arbitrary, the marginal net product of labour will be arbitrary too. In that event, short-period equilibrium wage-rates may lie anywhere between the value of the marginal composite product and

nothing; or, rather, they may lie anywhere between the value of the marginal composite product as the upper limit, and the amount below which workmen will refuse to work (approximately the amount of the unemployment insurance benefit) as the lower limit. Thus if in the depressed industry the marginal net product of labour and the short-period equilibrium wage-rates are to be determinate, we must know for sure, not only the size of the marginal composite product, and how much working capital and enterprise are added along with the marginal unit of labour, but also what the short-period supply prices of all the elements of working capital and enterprise will be to this particular industry.

So far as enterprise is concerned the matter is simple. As we have seen above, enterprise—the service of entrepreneurs—is made up of risk-bearing and of the work of organisation. Its short-period supply prices, for the various possible amounts, can be calculated from the marginal utility of income and marginal disutility of work and of risk-bearing to the entrepreneurs. For when we know the marginal disutility of enterprise we know how much utility would be needed to call forth a further unit of enterprise; and when we know the marginal utility of income, this supply price in terms of utility can be turned into a supply price in terms of income. By dealing with the various possible amounts of enterprise in this way—that is, by finding out, in regard to each possible amount of enterprise, how much

additional utility would be needed to call forth another unit, and by calculating from our knowledge of the diminishing marginal utility of income how much income would be required to yield that utility—we can draw up a complete schedule of the short-period supply prices of enterprise. As conceptions, the marginal utility of income and the marginal disutility of enterprise are precise; and therefore, since the number of entrepreneurs in the particular industry are in the short period given, the short-period supply prices of enterprise in that industry are determinate.

The question whether it is possible or not to estimate similar schedules of the prices at which working capital would be supplied to the particular industry in the short period must be examined in two parts; for the assumption that wage-rates are fixed under conditions of competition may be taken to refer either to the wage-rates of the depressed industry or to those of industry as a whole. Let us consider first the case in which it refers only to the wages of the particular depressed industry. In this case, wage-rates in the trades from which this industry gets the various parts of its working capital may be fixed under conditions of duopoly, and so be indeterminate.¹ If any of them are, in fact, fixed in this way, the prices that the industry has to pay for its working capital, and hence the amount that has to be subtracted from the marginal composite product in

¹ Cf. Pigou, *Economics of Welfare*, 2nd edition, Pt. III. Chap. IV., and Edgeworth, *Mathematical Psychics*, pp. 34-48.

order to find the marginal net product of its labour, will be indeterminate also; and there will therefore, in the short period, be an indeterminate marginal net product and an indeterminate equilibrium level of wage-rates. But though the short-period equilibrium level of competitive wages in the depressed industry will in these circumstances be indeterminate, there is little doubt that if the trades unions in the complementary industries are strong it will be lower than it would be if all wage-rates were competitive.

The history of the post-war period shows that this matter may be very important. It is generally agreed that during this period the trades unions in the sheltered industries, by keeping their wage-rates high, have made it harder for the depressed unsheltered industries to reach short-period equilibrium. This policy of keeping sheltered wage-rates high has brought about that result in three ways. In the first place, by keeping up the cost of living it has made it harder for a given lowering of wage-rates in the unsheltered industries to be brought about. Secondly, by raising the prices of raw materials, and thus by making the marginal net product of labour in these industries smaller than it would have been otherwise, it has caused the demand for labour, and hence also the equilibrium wage-rates, to be relatively lower. And thirdly, by causing fewer jobs to be available in the sheltered industries, it has made it harder for the unemployed to shift away from the unsheltered industries, and so has

caused the number seeking work there to be larger; in this way the first part of the short period has been greatly lengthened,¹ and in a second way, therefore, the equilibrium wage-rates have been made lower than they would have been otherwise.

The second part of our question relates to the case in which wage-rates are fixed under conditions of competition, not only in the given industry itself, but in all other industries as well. In this case it can be taken that, since wage-rates are all determined under conditions of competition, the prices that the depressed industry has to pay for the different parts of its working capital are the competitive prices. It has to be asked whether or not this fact makes them determinate.

Working capital consists of raw materials, including such things as light and power, and of short loans. The supply prices of the short loans depend on those of waiting, and may be accepted as determinate. The raw materials are the pro-

¹ No doubt this result is due partly to other factors, such as those which have caused most of the newer industries to be situated far from the highly-localised unsheltered industries. See Committee on Industry and Trade, *Further Factors in Industrial and Commercial Efficiency*, Chap. V, Section I, and pp. 15-16 and 25-27; also Beveridge, *Unemployment* (2nd edition), pp. 358-59. It is also partly due to the fact that by adopting short-time working, employers have been able to keep their staffs together largely at the expense of the unemployment insurance fund. (Cf. Clay, *The Post-War Unemployment Problem*, p. 118.)

ducts of the complementary industries. Their marginal supply price, which is the price that would have to be paid in order to induce the complementary industries to increase their output by a unit, will be equal to the net increase in costs, including those of enterprise, that the production of the additional unit of output in the complementary industries would involve; and these extra costs are those of certain specific amounts of the three prime factors, labour, enterprise, and working capital. It follows from this that the marginal composite product in the depressed industry is the composite product of the marginal unit of labour and of certain determinate amounts of enterprise and working capital in that industry—those amounts taken into employment together with the marginal unit of labour—and also of certain determinate amounts of enterprise, working capital, and *labour*, in the complementary industries.¹ As we have seen already, the supply prices of all these except the labour are definite, and can therefore be subtracted from the marginal composite product without leaving the result uncertain. The amount left over after this subtraction has been made is the product of the marginal unit of labour in the depressed industry and of a determinate quantity of labour in the

¹ Actually, the complementary industries would also have their complementaries, and so on; so that reactions which for convenience in discussion are supposed to relate only to the depressed industry and to its complementary industries, would not in fact be so narrowly confined.

complementary industries. Hence, whether the marginal net product in the depressed industry is determinate or not depends simply on whether or not it is possible to ascribe to the labour in the complementary industries a definite part of this determinate remainder; ¹ it depends on whether economic forces are such as to fix quite definitely how much of this mixed product of the two kinds of labour is to be taken by the complementary labour, or whether they are such as to leave the division undecided.

The answer to this question is different according as labour can, or cannot, in the short period shift from one industry to another; that is, it is different according as we are dealing with the second part of the short period or with the first. In the second part of the short period, when labour is mobile, the amount of the marginal composite product taken by the complementary labour is definite, and hence the marginal net product of labour in the depressed industry is definite also. But in the first part of the short period, while the obstacles to the mobility of labour are still too strong, these quantities are indeterminate. In the one case the supply prices of the labour in the complementary industries are ascertainable, and in the other case they are not.

¹ This remainder is determinate because the marginal composite product, the amounts of working capital and enterprise added along with the marginal unit of labour, and the supply prices of these amounts of working capital and enterprise, are all determinate. See above, pp. 44-46.

The reasoning on which these conclusions are based is as follows. Because wage-rates are fixed under conditions of competition, the whole of the labour seeking work will in equilibrium be employed; and any wage-rate that would enable all to get work again will be the short-period supply price of labour. Further, in both parts of the short period labour will be distributed between the given depressed industry and its complementary industries¹ in the way that, in the given conditions, is the most efficient technically; it will be distributed in such wise that, given the industrial equipment, the complementary industries will be producing the right quantity of raw materials for the finishing industry. This must be so in the first part of the short period—when all are again employed—if it was so before the original breach of equilibrium. In any event, this appropriate distribution of labour will be established in the second part of the short period;² for until it is, wage-rates per unit of efficiency

¹ Since the products of the complementary industries are merely the raw materials of the depressed industry, the latter is in this sense a finishing industry, and it will be referred to as such.

² The short-period equilibrium amount of labour in the finishing industry and its complementary industries will be fixed only when labour has been so redistributed between *all* industries that wage-rates are equal everywhere. A factor determining how much labour will be drawn away from the industries with which we are concerned is the elasticity of the short-period demand for labour (above the former equilibrium amounts) in other industries. But while this affects the *size* of the marginal net product of labour in the particular industry in the second part of the short period, it does not affect its determinateness.

will be higher in some industries than in others, and workmen will therefore tend to shift from the low-wage to the high-wage industries. Moreover, since this shifting of labour will go on till it has made all efficiency wage-rates equal,¹ it follows that the part of the marginal composite product left over as the product of the two kinds of labour—that is, of the marginal unit in the finishing industry and of the complementary labour taken on in conjunction with it—will in equilibrium, in the second part of the short period, be divided between them in proportion to their relative amounts; and since in theory it is possible to find out how large these amounts are, the marginal net product of labour is determinate. In relation to the second part of the short period this conception is therefore free from ambiguity.

But in relation to the first part of the short period it is indefinite; for in that period the amount of the marginal composite product to be taken by the labour in the complementary industries is unascertainable. The postulated fall in the demand for the finished commodity lowers the demand in the finishing industry for all the prime factors; and it therefore lowers the demand for labour both in the finishing industry itself and also in the complementary industries. The resulting competition for employment forces

¹ More accurately, it will go on till it has equalised not the wage-rates but the "net advantages" that would be gained from employment in the various industries. Cf. Marshall, *Principles of Economics*, p. 73.

down wage-rates. The more these fall in the complementary industries, the smaller becomes the amount that has to be subtracted from the marginal composite product, and hence the larger becomes the marginal net product of labour, in the finishing industry; the more wage-rates fall either in the finishing industry or in the complementary industry, the less, other things being equal, need they fall in the other. They will go on falling in both until a position of short-period equilibrium is reached; and such a position will be reached when the aggregate wages paid to the marginal unit of labour in the finishing industry and to the co-operant labour in the complementary industries, are equal in value to the part of the marginal composite product left over to be divided between them. When that position is reached, there will be no tendency in the first part of the short period for wage-rates in either industry to fall further, or to rise above the level they are at when equilibrium is first reached. Thus the way in which the aggregate fall in wages is divided between the two sorts of labour depends on how fast wage-rates fall in the one industry compared with how fast they fall in the other. The fall in the demand for labour is likely to appear in the finishing industry first; and hence if wage-rates in this industry fall quickly, they will probably fall the further.¹ But if in this industry they

¹ The truth of this is exemplified by the larger percentage fall, during the post-war period, in the wage-rates of the unsheltered industries than in those of the sheltered industries. The return

are stubborn, they will probably fall quite as far in the complementary industries. At any rate it is clear that in the first part of the short period, though the *average* wage-rate in the finishing and complementary industries is determinate, the wage-rate in each of these industries individually is indeterminate; the amount that has to be subtracted from the marginal composite product in the finishing industry, in order to find the marginal net product of labour there, may be indeterminate over a fairly wide range.

Our conclusions on the question whether the marginal net product of labour is determinate or not will now be brought together. In the first place, when the assumption that wage-rates are competitive refers only to the wage-rates of the particular depressed industry, those of the complementary industries may be settled under conditions of bilateral monopoly, and so be indeterminate; and in that event the marginal

to the gold standard in 1925 caused exchange rates to rise. This rise brought about an automatic and proportionate fall in the sterling prices that we could get for our exports. Thus the fall that took place in the monetary demand for goods struck the unsheltered industries first and hardest; and this has been true of the later fall also. The above argument would therefore lead us to expect that, in the first part of the short period following these events, wage-rates would fall further in the unsheltered than in the sheltered industries. And as we shall see later (in IV. i. 1), they in fact did. Moreover, as we have seen already, the policy of preventing wage-rates from falling in the sheltered industries has caused the first part of the short period to be greatly lengthened.

net product of labour in the depressed industry will likewise be indeterminate. In the second place, when the assumption refers to the wage-rates of all industries, the marginal net product will be determinate in the second part of the short period but indeterminate in the first part. For while in the second part of the short period the supply prices of the complementary labour (and hence the amount to be deducted from the known remainder of the marginal composite product) is calculable, in the first part, since labour cannot then shift from industry to industry, it is incalculable.

II. *Inequality between the marginal net product of labour and equilibrium wage-rates*

In finding out whether it is or is not always possible to determine the short-period equilibrium wage-rates, the second step is to ask whether wage-rates, if they are to yield short-period equilibrium, are bound to be equal to the value of the marginal net product of labour. It has already been shown that because of the competition of workmen for employment they cannot exceed it; and thus it only remains to ask whether or not the competition of employers for workmen is sure not to let them stay below it.

Let us therefore suppose that, in falling from their disequilibrium level, wage-rates in the given industry have overshot the mark, and have fallen below the highest point at which all the workmen would be again employed; that is, let us suppose

that they are now lying below the value of the marginal net product of the equilibrium amount of labour. It can be taken that in these circumstances each entrepreneur is employing the same amount of labour as he was employing before the breach of equilibrium. There will then be no force at work pushing the wage-rate upwards unless someone would gain, at the existing rate, by employing at least one unit of labour more than this equilibrium amount; and this means that the wage-rate will stay the same unless there is at least one firm which, by taking on an extra unit of labour, would make a net addition to its output more than large enough to pay the extra wage. Hence in short-period equilibrium the competitive wage-rate may lie below the value of the marginal net product of the industry's equilibrium amount of labour, so long as there is no firm in which it is below the net product of an additional, sub-marginal, unit. From any position between these two rates that it chances to occupy there is nothing to make the wage-rate shift; it will stick wherever, within this range, it happens first to alight; ¹ and the range is therefore a range of indeterminateness.

If the various factors of production always took on the forms that best suited them for working with the quantity of labour actually employed, the difference between the net product of the

¹ The rates paid to the individual workmen may alight at different levels, but even if they do, competition will soon force them all to the average level.

marginal unit of labour and that of the sub-marginal unit would be minute; with the result that the above-mentioned range of indeterminateness would be negligible. But it does not follow that this range is negligible during the short period. For to readapt the factors of production takes time; and throughout the short period, as we know, the forms they assume continue to be those which were fitted for the amount of labour employed before there occurred the breach of equilibrium. Hence in industries that use elaborate machinery, it is probable that the net product of the sub-marginal unit of labour is in most firms considerably below that of the marginal unit, and is perceptibly below it in all firms.¹ But in the second part of the short period this range of indeterminateness of wage-rates is the same in all industries as it is in the industry in which it is least; and therefore, since in some industries the amount of labour to be used with the fixed capital is very flexible, it is probably quite negligible. But in the first part of the short period it may in some industries be considerable.

But this range of indeterminateness, however large, can be of significance only if wage-rates can, in fact, come within it. If they cannot get past the highest point, and are therefore unable to get inside the range, the fact of their being able, if they could get inside it, to rest at the point

¹ Cf. Robertson, *Minutes of Evidence before the Committee on Finance and Industry* (1931), Vol. I. p. 324.

that they happened to reach, will be without significance; in such circumstances they are bound, in equilibrium, to be equal to the value of the marginal net product of labour. And they are sure to stop at the highest point if, in coming down from their disequilibrium level, they take very short steps; it is only if they take long steps that they can get well inside it. But long steps do not appear to be inconsistent with competition; and it may therefore be accepted that, at least in the first part of the short period, competitive wage-rates have a small range of indeterminateness, quite apart from the indeterminateness, within the individual industries, of the marginal net product of labour itself.

The conclusions on this question are therefore that, in short-period equilibrium, wage-rates must lie within a fairly narrow range of indeterminateness; they must lie between the value of the marginal net product of labour and that of the largest sub-marginal net product. The sub-marginal product concerned in the second part of the short period is the largest in industry generally, in which case the range of indeterminateness is negligible. But in the first part of the short period it is the largest sub-marginal net product within each of the individual industries; and in this case the range in some industries may be significant. Usually, however, the competitive rate will be very close to the upper limit of the range; for it cannot sink far below that level unless it sinks in jerks, which it is not likely to do

as it nears a position of equilibrium. In the first part of the short period, however, the position of the range of indeterminateness in any given industry is itself indeterminate; since we cannot calculate how large, in that period, the marginal net product of labour will be. On the other hand, the position of the range in the second part of the short period is determinate; and so too is its average level for industry as a whole in the first part of the short period.

Out of these conclusions there arises the important truth that, when the demand for labour changes, wage-rates will be readjusted in the most satisfactory way, only if the collective wage agreements made in the separate industries are brought into relation with each other. The importance of such co-ordination will be shown more fully later, as further arguments in favour of it are developed. But there is reason enough for it in the mere fact that while, during the first part of the short period, it is impossible to determine the marginal net product of labour (a wage that would restore equilibrium) in any *individual* industry, it is possible to determine the *average* marginal net product of labour in industry as a whole.

CHAPTER IV

THE SLOPE OF THE MARGINAL NET PRODUCTIVITY CURVE OF LABOUR

AT the end of Chapter II it was pointed out that an examination would later have to be made of the various factors, there set out, which determine how much a given lowering of wage-rates in a depressed industry would, other things being equal, alter the volume of the industry's employment. The first of these factors is the slope of the marginal net productivity curve of labour, and it will be discussed in the present chapter. Our aim will be to find out what this slope is likely to be in a representative industry.¹ We wish to know not only whether the curve is inclined positively or negatively, but also whether or not it is steeper at one end than it is at the other; that is, we must find out the slope of the whole curve. In trying to do this, it will be necessary first to consider how much the size of each of the things on which the marginal net product depends is likely to grow or shrink, as

¹ The schedule of the marginal net product of labour for the whole industry is obtained by adding together those of the individual firms.

the quantity of labour employed in the industry is altered, and then to make a guess what the net result of all these changes will be on the size of the marginal net product.

1. Dependence of the marginal net product of labour on the price level and on psychological factors

When the quantities of the various factors of production that co-operate with labour are given, the long-period marginal product of a given amount of labour cannot alter; it depends solely on how much less output there would be, after the co-operant factors had been suitably reshaped, if one unit of labour were put out of work. In the same way in the short period, when a given quantity of labour is being employed to work the fixed amount of equipment, the composite product of the marginal unit of labour and of the given amounts of working capital and enterprise taken into or put out of employment at the same time as it, is settled once and for all. But this cannot be said of the marginal net product of labour; even though the equipment is fixed, the marginal net product of a given amount of labour can, in the short period, alter. For its size depends not only on the size of the marginal composite product, but also on how much has to be subtracted from this to cover the supply prices of the given amounts of the co-operant prime factors. And although, so long as the equipment is given, the marginal composite product must stay the same, the supply

prices of the working capital and enterprise, expressed in terms of an amount of the given product, can change.¹ Anything that raises the *product* supply prices of either the working capital or the enterprise will automatically lower the marginal net product of labour; and anything that lowers those supply prices will cause the marginal net product to rise. Such alterations will be brought about by changes in the price level and by changes in the tone of mind of entrepreneurs and investors. For, in the first place, movements in the money rate of discount do not keep pace with movements in the price level;² so that as the price level falls, the *product* rate of discount tends for a time to rise, and *vice versa*. In the second place, changes in the conditions of demand react on the attitude of mind of the entrepreneurs. When conditions grow better, entrepreneurs as a whole eventually come to think that they are better than they are, and when conditions grow worse, they eventually come to think that they are worse than they are;³ and with these changes in their outlook go changes in their willingness to undertake a given risk. As they grow in optimism and hence in daring, the supply price of their enterprise falls; and as they grow in pessimism and hence

¹ Supply prices reckoned in terms of an amount of the product that the factors of production concerned are employed in making will be called the "*product* supply prices."

² Cf. Pigou, *Industrial Fluctuations*, pp. 257-58.

³ Cf. Pigou, *ibid.*, I. vi.

in timidity, it rises. Thus the marginal net product of labour will vary with the tone of mind of entrepreneurs and with the price level; growing in size as entrepreneurs become more optimistic and as the price level rises, and shrinking in size as they become more pessimistic and as the price level falls. And hence with the heightening of a boom the equilibrium level of wage-rates will rise, and with the deepening of a depression it will fall, because of the resulting changes both in the marginal net product itself and in the value of each unit of that product.

Because of all this, we must begin our discussion of the marginal net productivity curve by stating what the particular conditions are to which it refers. It will be most convenient to consider the curve that relates to the conditions existing before the breach of long-period equilibrium; since in those conditions the price level and the mental outlook of entrepreneurs and investors were normal. It is easy to see that at the point of equilibrium this particular curve must coincide with that of the long-period marginal product. For since conditions are in long-period equilibrium, they must also be in short-period equilibrium; it must be impossible for the representative entrepreneur to gain by taking on or dismissing a unit of labour, both in conditions that enable the other factors to be suitably remoulded, and also in those that do not. This point of coincidence will be our starting-point; and the slope of the marginal net pro-

ductivity curve will be deduced by taking the various things on which the size of the marginal net product depends, and by asking how much the size of each of these things would be altered if, in the given conditions, the amount of labour employed were unit by unit gradually reduced.¹

II. *Methods of reducing output in the short period*

Before we can tell what effect a reduction in the quantity of labour would have on the marginal net product of the remainder, we must know how the reduction would be planned. At the outset, therefore, a brief statement must be made of the short-period methods of reducing output that are used in practice.² There are two general methods, each having a number of variants. Firstly, there is the method of working the full staff short time, and secondly, there is the method of dismissing part of the staff and working full time with the remainder. The aim of each is to reduce the effective quantity of labour employed, and so to reduce the size of the wages bill; and the choice between them rests, at bottom, on considerations of technique.

Output can be reduced by the short-time

¹ The same conclusions would be reached if, instead of supposing labour to be gradually reduced, we supposed it to be gradually increased again after it had already been reduced; the same factors would determine the result, though they would be seen working in the opposite direction.

² For a fuller discussion of these methods, see Pigou, *Economics of Welfare*, 2nd edition, III. xi.

method by means of three principal devices—by working either fewer hours per day, or fewer days per week, or by running fewer of the machines. The first is usually adopted in industries in which a saving can be made on the most expensive working hours, so long as loss is not thereby caused in other ways. This is the recognised method of meeting a temporary depression in the spinning section of the cotton industry;¹ for in that industry a shortening of the working day enables a saving to be made on lighting, and it does not cost much to start the machinery running. By cutting out the most costly working hours, this particular way of reducing the quantity of labour employed has the effect of somewhat lessening the amount of working capital required per unit of labour. But in industries in which there is a heavy cost in getting up power, as, for example, there is in coal-mining, this method would cause the quantity of working capital per unit of labour to increase. Moreover, in the coal-mining industry it would have the special drawback that it would cause a rise in the average rate of efficiency wages. For while the whole of the working day would have been shortened, the part of it spent underground in getting to and from the place of work would be unchanged, and thus of the aggregate time in respect of which wages are paid to the day-workers (and in Great Britain these form about 60

¹ Cf. Committee on Industry and Trade, *Survey of Textile Industries*, p. 34.

per cent. of the total¹) a smaller proportion than before would be spent in actual work. In this industry, therefore, and in some of the others in which the initial cost of getting the machinery going is high, it is usual to adopt the second device—that of working fewer shifts per week. Lastly, the device of working fewer of the given number of machines is sometimes used—especially in industries that pay piece-rates—if it either enables a considerable saving to be made on the cost of running the machinery, or cuts out part of the waste that would otherwise occur in raw materials. Thus here again there is some reduction in the average amount of working capital required per unit of labour. It is the typical method used in the weaving section of the cotton industry.²

An important reason why many firms prefer the short-time method to the method of dismissal is that they wish to keep their staffs together. By doing this in bad times they safeguard themselves against a shortage of labour when demand improves. Moreover, in many firms the work is of such a kind that the workmen who have already become specialised to it are more valuable to the particular employers than other workmen would be; and where this is so, the wish to keep the staff together is often decisive.³

¹ Cf. Committee on Industry and Trade, *Survey of Industrial Relations*, p. 110.

² Cf. Committee on Industry and Trade, *Survey of Textile Industries*, p. 32.

³ It is important in this connection to notice that the unemployment insurance scheme has enabled employers to keep

But in some industries there is a natural preference for the method of dismissal, and this preference is likely to be stronger if wage-rates are mainly time-rates—as they are in, for example, the iron and steel industry¹—than if they are mainly piece-rates. Such a preference is likely to exist in industries in which the given plant and machinery can be kept going with less than the normal quantity of labour; for when this can be done, the machines formerly worked by the dismissed labour, though worked to less advantage than before, will be worked to some advantage. Again, this is the method normally used when it is decided to put some of the fixed plant temporarily out of use. Thus it is the normal method in the shipbuilding industry—which suffers from wide fluctuations in the volume of its output²—and also in the shipping industry, in which, during times of depression, ships are laid up.³ Similarly, during times of industrial depression, many large concerns stop work at some of their plants and concentrate the available

their staffs together with less cost to themselves than would have been involved otherwise. For by working short time they can spread the available work over more workmen and throw the cost of those not actually at work at any time on the unemployment insurance fund. (Cf. Clay, *The Post-War Unemployment Problem*, p. 118.)

¹ Cf. Committee on Industry and Trade, *Survey of Industrial Relations*, p. 112.

² Cf. Committee on Industry and Trade, *Survey of Metal Industries*, pp. 370 and 372.

³ Cf. Committee on Industry and Trade, *ibid.*, p. 385.

work on the rest; and some firms even stop work altogether.¹ Although, in these circumstances, the workmen still employed make no use whatever of the machinery put into idleness, the average help per unit of labour given by the machines is likely to be greater after a part of the equipment and labour have been put out of work than it was before; for the plants shut down and the machines left idle are usually the least efficient and the most worn.

We are now in a position to discuss the separate factors that govern the slope of the marginal net productivity curve of labour in a representative industry. As we have seen already, these factors fall into two groups—those which govern the size of the marginal composite product (at each point) and those which determine how much (at the same point) has to be subtracted from this to furnish the supply prices of the working capital and enterprise added along with the marginal unit of labour. These two groups of factors will be discussed in the two following sections.

III. *The curve of the marginal composite product*

As the quantity of labour employed is gradually reduced, the size of the marginal composite product must become either greater or less, or it must remain unchanged. What will happen to

¹ This method of a temporary shut-down is used in the coal-mining industry. Cf. Report of the Royal Commission on the Coal Industry (1925), (Cmd. 2600), p. 60.

it, in fact, depends on how much use the various amounts of labour other than the equilibrium amount can make of the given equipment. In this connection there are three things to consider: firstly, how much use the workmen still employed can make of the machines formerly operated by those who have been put out of work; secondly, how much hindrance is caused to the workmen still employed by those spare machines that cannot be utilised; and thirdly, how much a reduction in the amount of labour disorganises the management.

When a reduction takes place in the quantity of labour, there will be more machines available for each unit of labour employed than there were before. But unless output would be greater if these extra machines were worked than it now is when they are not worked, they will be left unused.¹ For a reduction in the quantity of labour could nearly always be so arranged that each workman still employed would operate precisely the same machines as before; those formerly operated by the labour no longer employed being left in idleness. This is in effect what happens when fewer hours are worked per day and when fewer days are worked per week. In

¹ This statement must be slightly qualified. It may occasionally happen that, with a given quantity of labour, a firm would get a smaller output in the present by working all the machines than it would get by working only a few; but nevertheless it may be decided that, in the interests of future production, they should all be kept going; since there are some plants (*e.g.* ships) that rapidly deteriorate when not used.

these circumstances, the reduction in the number of machines actually operated would be in proportion to the reduction in the quantity of labour. In that event, if all machines of each kind were equally good, and if we were concerned only with efficiency-units of labour,¹ the size of the marginal composite product, so far as the present argument goes, would be the same throughout; for the putting out of work of an extra unit of labour would cause the same reduction in output if many units had been put out already, as it would cause if only a few units had been put out already; and hence the curve of the marginal composite product would be a horizontal straight line.

But in fact the machines are not all equally good; the worst are usually put out of action first, and when demand is recovering they are put into action last. Besides, in practice, employers are concerned not with efficiency-units of labour but with given workmen; and they therefore have a strong tendency to dismiss first, and to take on again last, those workmen who are least efficient.² For these two reasons, the

¹ We may define an efficiency-unit of labour as that amount of labour the subtraction of which in short-period equilibrium would cause the output to fall by a unit. Some workmen may embody more of these efficiency-units than others. But if all are paid at the same efficiency wage-rate, they will be paid in proportion to the number of efficiency-units that they embody, and other things being equal, there will be no advantage in dismissing the less efficient.

² Cf. Pigou, *Economics of Welfare*, 2nd edition, pp. 492-93.

greater the amount of labour that has been dismissed already, the more will output be reduced by the dismissal of a further unit.¹ Moreover, this tendency for the marginal composite product to rise as the amount of labour employed is gradually reduced, is brought about in another way also. For though the smaller amount of labour will not be able to make as much use of the spare machines as it could if they were more suited to its requirements, it will be able to make some use of them. Thus in so far as the curve of the marginal composite product depends on the use that the workmen still employed can make of the machines formerly operated by the labour that has been dismissed, it will be roughly a straight line with a perceptible though not large negative slope.²

But this is not the whole of the matter. For, in the second place, these spare machines are there whether they are used or not; and it may be that some of those which are not used, by being in the way of the workmen still employed, are not a help but a hindrance. Clearly, however, this cannot be so where output is reduced by either working short time or shutting

¹ To express this fact if we were thinking of an increase in employment, following a depression, we should say that the greater the amount of labour that has been taken on again already, the less will output be increased by taking on a further unit.

² The fact that, as labour is reduced, the number of spare machines per employed workman becomes progressively greater, may possibly make the curve slightly concave.

down some of the plants; hindrance to the labour still employed can only occur when some of the machines in a factory are put out of use while the rest are kept going, and hindrance of this sort throughout the whole of industry is probably not serious. Besides, these machines that are a hindrance when not used would also be a hindrance to the workmen using other machines even if the factory were running at normal capacity. Thus when we are considering not the height but the slope of the curve of the marginal composite product, the only cases in which account must be taken of the hindrance caused by the unused machines are those in which it is greater or less than it would be if these machines were being operated; and there is probably little difference either way. Hence this point does not affect our conclusion.

Lastly, it may be urged that since the management is accustomed to the equilibrium amount of labour, it will become disorganised if it employs less than that amount. It is evident that here again the argument can apply only if the reduction in the quantity of labour involves a change in the arrangements for working the individual plants. As regards such a reduction it probably has some weight. But there is no reason for regarding it as important enough to influence noticeably the curve of the marginal composite product in a representative industry. We may therefore conclude that this curve is roughly a straight line and that it is inclined negatively.

IV. *Subtractions from the marginal composite product*

Even when we know the size of the marginal composite product, we have still to find out what amount of it is due to the working capital and enterprise that is put out of work together with the marginal unit of labour. Thus in order to find out how the curve of the marginal net product of labour will slope, we must find out what changes take place, as the quantity of labour is gradually reduced, not only in the size of the marginal composite product, but also in the amount of that product due to this working capital and enterprise. In examining this second part of the question there are two things to discover: first, what changes take place, as the quantity of labour is reduced, in the amounts of working capital and enterprise dismissed with the marginal unit of labour; and secondly, the supply schedules of working capital and enterprise.

In discussing the first of these things, all that need be done is to recall the conclusions regarding working capital that arose when we were examining the different ways of reducing output. These conclusions were to the effect that some of the ways in which output is reduced are such that, in the early phases of the reduction, working capital is reduced by a larger proportion than is labour. At any rate this is so when output is reduced by working short time or by working

fewer of the machines in each factory. The result is that the amount of working capital put out of employment with the marginal unit of labour will be greater, if only a few units have been put out already, than if many have been. As regards the amount of enterprise subtracted with the marginal unit of labour, there appears to be no reason for expecting it to alter. Thus taking enterprise and working capital together, the actual quantity put out of work with the marginal unit of labour will become somewhat smaller as the total amount of employed labour shrinks.¹

But before we can tell whether or not this is true also of the amount of the marginal composite product required to pay for these quantities of enterprise and working capital, we must know what happens to the supply prices of enterprise and working capital per unit as the quantity employed is reduced. As we have seen above,² the supply price of enterprise depends on the marginal disutility of enterprise and on the marginal utility of income. When we know the marginal disutility of the quantity of enterprise at present supplied, we know how much

¹ If we were thinking of a recovery from depression, and hence of an *increase* in employment, we should express the same fact the other way round, by saying that the quantities of enterprise and working capital taken into employment with the marginal unit of labour will become somewhat larger as the amount of employed labour grows.

² Pp. 58-59.

additional utility would be needed to call forth a further unit; and when we know the marginal utility of income, we can calculate how much income—and therefore how much of the given product—would be required to yield that utility. The marginal supply price of every possible amount of enterprise can be deduced in the same way; and a complete schedule of these supply prices can thus be drawn up. Now keeping in mind that enterprise includes risk-bearing, it is reasonable to think that, as the amount of enterprise increases, the marginal disutility of enterprise will become greater—progressively greater. If this view is correct, it follows that the addition to utility required to call forth a further unit of enterprise will become larger as the total quantity supplied increases, and that it will become larger by increasing amounts; the supply price of enterprise, expressed in terms of utility, will become progressively greater as the amount supplied increases. Further, it is generally agreed that as income increases, its marginal utility, other things being equal, diminishes. Hence when the supply price of enterprise is expressed as an amount of income, its tendency to rise progressively as the quantity supplied increases (or to fall regressively as the quantity supplied decreases) will be more marked than when it is expressed in terms of utility.

Let us now turn to working capital. On the

assumptions of Particular Equilibrium theory, a change in the amount of short loans demanded by a particular industry would not alter their supply price. Thus the supply curve of working capital to a particular industry will be other than a horizontal straight line only if the supply price of the raw materials produced to meet the needs of this industry does *not* remain the same when the quantity supplied is altered. In fact it is almost certain to change; for it can be taken as a general rule that if the quantity of a commodity demanded increases, the supply price in the short period will rise,¹ and that if the quantity demanded decreases, the supply price in the short period will fall. The reasons for this are those we have been examining in the present chapter; for the factors that determine the marginal net product of labour also determine the short-period supply price of the product.

It can now be seen that the two factors governing the amount to be subtracted from the marginal composite product on account of enterprise and working capital both lead to the same result. It has been shown, first, that as the amount of labour employed is diminished, the quantity of

¹ Thus Marshall speaks of "the almost universal law that the term Normal being taken to refer to a short period of time *an increase in the amount demanded raises the normal supply price.* This law is almost universal even as regards industries which in long periods follow the tendency to increasing return." (*Principles of Economics*, p. 370.)

working capital concerned tends to become less, and secondly, that the supply prices both of working capital and of enterprise tend to fall—those of enterprise tend to fall regressively—as the amounts supplied are reduced. It therefore follows that the amount to be subtracted from the marginal composite product becomes smaller as the quantity of labour shrinks, both because the actual quantities of working capital and enterprise dismissed with the marginal unit of labour become smaller, and also because the supply prices of these quantities, per unit, become smaller; and since the fall in the supply price of enterprise is regressive, the amount to be subtracted from the marginal composite product falls regressively.

We can now come to a conclusion regarding the curve of the marginal net product of labour. While, as the quantity of labour employed is reduced, the marginal composite product becomes larger, the amount to be subtracted from it on account of working capital and enterprise becomes regressively smaller. Hence as the amount of labour employed declines, the marginal net product of labour tends, for both of these reasons, to grow larger; but since the amount to be subtracted from the marginal composite product falls regressively, the marginal net product rises regressively. It follows that the curve of the marginal net product of labour is inclined negatively, and that it tends to be convex; the

negative inclination is greatest near the point of equilibrium.¹

¹ Along Ox measure units of labour, and along Oy amounts of the product. Then the curve of the marginal net product of labour in a representative industry, when conditions are normal,

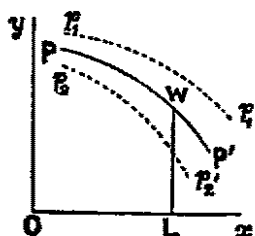


FIG. 3.

may be represented by PP' . The similar curve (p_1p_1') relating to conditions of optimism would be somewhat higher and flatter, since in those conditions the supplies of enterprise and working capital would be more elastic; and the curve (p_2p_2') relating to conditions of depression would be somewhat lower and steeper, since in those conditions the supplies of enterprise and working capital would be less

elastic (see above, I. iv. 1). If OL is the equilibrium amount of labour, WL will be the equilibrium product-wage. Beyond W the curve gets much steeper; for since the machinery is adjusted to OL units of labour, there will be no more idle machines, once OL units are again employed, to bring into employment with the marginal unit of labour.

CHAPTER V

INFERENCES CONCERNING WAGE REGULATION

THE foregoing study of the factors that govern the height of equilibrium wage-rates in a single industry was designed as merely the first step in examining whether or not it would be possible to restore equilibrium, when there exists a general depression, by lowering the level of wage-rates. Nevertheless, out of that study there arise three inferences that should be taken into account in all schemes for bringing wage-rates under control. These inferences relate to the difficulties that would be met with in trying to keep wage-rates always at the equilibrium level, and they will therefore be of use to us at a later stage in the argument.

The first inference is that when, for any reason, conditions have arisen that make the existing wage-rate too high for all workmen to keep their jobs, equilibrium would *not* be restored by lowering the wage-rate at once till it is equal to the new value of the "true" marginal product of labour; that is, it would not be restored by bringing product wage-rates back to their old height. For

in order to reach the equilibrium level in the short period, wage-rates must be brought down to equality with the value of the marginal *net* product of labour. Now when conditions are normal, the marginal product and the marginal net product of the equilibrium amount of labour are equal. But we are here concerned with conditions of slump; and other things being equal, the marginal net product relating to such conditions is smaller than that relating to normal conditions. It therefore follows that in order to reach the equilibrium position in the short period, wage-rates must in a depression fall to a level that is *below* the new value of the "true" marginal product of labour.

In the first part of the short period (while labour cannot shift from industry to industry) the marginal net product of labour in each of the individual industries is indeterminate; but the average of all these separate marginal net products is determinate. These facts give rise to the second inference, which is that in readjusting wage-rates after a change has taken place in the demand for labour, the wage agreements reached in the separate industries need, in some way, to be co-ordinated.¹

The last inference is that given such a change in the demand for labour, the readjustment of wage-rates that would be required in order to maintain equilibrium, even supposing that no

¹ See above, pp. 71-72.

new cause of disequilibrium should arise, would be not a single readjustment but a continuous process of readjustment; and this process would have to go on, while the conditions of one period gradually merged into those of the next, until a state had been reached of very-long-period equilibrium. There would not be a fixed equilibrium level of wages even in the short period; for the marginal net product of labour (and hence the equilibrium rate of wages) rises or falls with growing optimism or pessimism of entrepreneurs. And as we have just seen, the equilibrium rate is different in the short period from what it is in the long period. Moreover, it is different in the long period from what it is in the very long period. For a change in the rate of pay obtained by a factor of production will cause a change in the amount of that factor in being; and the very long period takes such reactions into account. In very-long-period equilibrium all these reactions will have ended; there will be no tendency, so far as the given cause of disturbance is concerned, for the supplies of the factors of production to alter. The equilibrium rate of pay of each factor will be equal to the value of the marginal product of the amount of it then supplied. But these rates of pay will be different from what they were in the long period; since the changes that in the meantime will have occurred in the total amounts of the factors of production will have altered their marginal products. Furthermore,

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these various reactions are going on all the time ; the equilibrium level of wages is never still. From this it follows that to keep wage-rates always at precisely the equilibrium level would in practice not be possible.

PART II
GENERAL EQUILIBRIUM

CHAPTER I

ASSUMPTIONS

So far we have supposed that when a given industry that is suffering from depression lowers its wage-rates there will be no reactions on employment in other industries. In connection with a depression confined to a single industry, the other industries being in equilibrium, this assumption may pass. But from now on we shall be concerned with general depression; and in these circumstances a lowering of wage-rates in one industry can and will set up reactions on the volume of employment in others, and as a result, it will set up a further reaction on employment within the given industry itself. The next step, therefore, will be to study the nature of these reactions.¹

Let us therefore suppose that a fall has taken place throughout industry as a whole in the monetary demand for labour,² with the result that

¹ These reactions form the second group of factors distinguished on p. 19.

² In making this assumption it is not meant to pronounce on the question whether such falls in the demand for labour are primary, or whether they are only secondary, phenomena of trade depressions.

the equilibrium level of wage-rates has fallen below the actual level. We wish to find out in what ways, and to what extent, a lowering of wage-rates by one industry would in these circumstances react on the volume of employment of all the others. In the conditions of depression that would exist, wage-rates would tend to fall in other industries also. But for purposes of study, the effects of a wage reduction in one industry on employment in others must be kept separate from the effects of a reduction in those industries' own wage-rates; and thus during the present part of the analysis that tendency will be left out of account.¹

In making this study of the reactions that a lowering of wages in one industry would cause on employment in the rest of industry, and of the modifications in these reactions that would be caused by the concurrent lowering of the wages of other industries, it will be convenient to begin with certain assumptions. In Chapter IV these assumptions will be dropped, and the argument will be brought into closer touch with actual conditions. The assumptions are as follow:—

(i) That the industrial system with which we are concerned is "closed."

(ii) That wage-rates and other contract rates, instead of being stated in terms of money, are stated in terms of the product of the particular industry in which the labour or other factors of production receiving them is employed. Thus

¹ It will be taken into account in Chapter III of this Part.

we suppose that the wage-rates of bootmakers are expressed in terms of boots, that those of watchmakers are expressed in terms of watches, that those of bakers are expressed in terms of loaves, and so on. Since these product wage-rates determine the cost of labour, per unit of efficiency, it is they which are important from the point of view of entrepreneurs and of the volume of employment. Workmen, however, are interested in the real wage-rate; in exchange for their boots, their watches, their loaves, they wish to get an equivalent value of goods in general. But it is immaterial whether they do this through the medium of the entrepreneurs or whether they do it directly. In either event, the wage-rates that in one industry are lowered and that in the others remain unchanged are the respective product wage-rates. This assumption will enable us to set aside for the moment the complications that might arise out of monetary policy.

(iii) That the industry whose wage-rates are lowered by a given percentage consists of all the processes in making and marketing a given consumable commodity (say cotton goods), and that no part of this industry is in any way supplementary to any other industry. The lowering of its wage-rates will therefore not directly affect costs of production in other industries.

(iv) That when wage-rates are lowered in the one industry there are more than enough unemployed workmen in the others to meet any resulting increase, at the existing wage-rate, in the

demand for labour; for otherwise the change in employment, if an increase, would be limited by and thus depend upon the amount of unemployed labour available.

The adoption of these assumptions, and the use of the method that is based upon them, may give to the discussion an air of unreality. Nevertheless, if we are to get a clear understanding of the reactions that a lowering of wage-rates would set up, we must get beneath the monetary system and examine the nature of the fundamental factors on which those reactions would depend. It will then be possible to see how these factors and their effects would be altered by different monetary policies. As before, the discussion will relate to conditions of competition.

CHAPTER II

THE EFFECTS ON THE VOLUME OF EMPLOYMENT IN OTHER INDUSTRIES

A LOWERING of wage-rates in the cotton industry will alter the volume of employment in other industries by altering their demand for labour; and it will do this by altering their costs of production or the demand for their goods. The effects that it will have in these ways on the volume of employment in other industries may be divided into two kinds, which will be called the primary and secondary effects. *Primary effects* are those changes in employment in the rest of industry that the fall in cotton supply prices, which will be brought about by lowering cotton wage-rates, will cause directly; they are the changes in employment which the lowering of cotton supply prices would cause if the rest of industry were a homogeneous unit producing a single commodity. *Secondary effects* are the changes that the lowering of cotton supply prices will cause indirectly, through the resulting redistribution of expenditure. Arising in conjunction with, and at the same time as, the primary effects, they occur because the rest of industry is not homogeneous,

but is composed of many industries each producing a different commodity. The size of each of these two kinds of effects will depend partly on the size of the other.

I. *Primary effects*

The volume of employment in the non-cotton industries will not change immediately the fall in wage-rates has taken place. At first the entrepreneurs in the cotton industry will gain all that the workmen have given up; the income of the industry, though differently distributed, will be unchanged in amount. If the entrepreneurs spend this transferred product on the same goods as the workmen did, employment in other industries, while these conditions last, will be wholly unaffected. If they spend it differently, some industries will slightly expand and others will slightly contract. So long, however, as the entrepreneurs hoard (that is, refrain for a given length of time from consuming or exchanging) the same proportion of the transferred product as the workmen would have hoarded, the volume of employment will remain about the same. But under conditions of competition this state of affairs will not last long. For on the amount of enterprise at present supplied entrepreneurs will be making an extra profit; and each, wishing to gain still further, will therefore increase his output; and he will go on increasing it up to the point at which the profit obtained on the marginal unit of enterprise equals the supply price. This

increase in the output will cause the price of cotton to fall; and it is only when it has already done so that the primary effects on the volume of employment in the non-cotton industries can arise.

The fall in cotton supply prices will have primary effects on the volume of employment in the non-cotton industries only if it alters either the rate of product wages or the size of the marginal net product of labour in those industries;¹ and it will alter the size of the marginal net product only if it causes the part of the unchanged marginal composite product needed to compensate either the working capital or the enterprise (which is added with the marginal unit of labour) to be greater or less than it was before. Thus primary effects can arise in three different ways. For the fall in the price of cotton in terms of other goods may cause a change to take place, in the rest of industry, in the share of the marginal composite product claimed by either the labour, the working capital, or the enterprise.

The first two of these three possibilities can be grouped together as one possibility—the possibility that because of the fall in the supply prices of cotton, entrepreneurs in the rest of industry will have to pay away more or less of their product than before in getting their labour and their working capital. This is likely to happen if the

¹ It will help to keep the distinction between primary and secondary effects clear if all the non-cotton industries are at present spoken of as “the rest of industry,” as though they formed a single unit.

supply prices of the labour and the working capital are expressed in terms of something other than the particular product which, in each case, these factors are engaged in making; ¹ hence it is likely to happen if, for example, they are expressed in terms of consumption goods in general, including cotton. For the fall in the supply prices of cotton in terms of other goods is likely to alter the ratio of interchange between this other something and the product of each of the non-cotton industries; and it is therefore likely to alter the product rate of wages and the product rate of interest, and hence also the volume of employment. In practice, as we shall see later, ² primary effects arising in these two ways are probably important. But they have been ruled out of the discussion at present by the assumption that rates of wages and interest are fixed in terms of the particular product of the relevant industry.

On this assumption, primary effects on the volume of employment in the non-cotton industries can arise only in the third way; that is, they can arise only if the fall in the supply prices of cotton causes a rise or fall in the amount of the marginal composite product that is required as profit. But as we shall see presently, unless the rest of industry

¹ The fall in the supply prices of cotton cannot react on the cost of labour and working capital in the rest of industry by altering the amounts of labour and working capital employed in making cotton goods; for since the cotton industry is only one industry among many, such reactions would be negligible.

² II. iv. 4, and IV. i. 1.

spends precisely the same amount of its wares as before in buying cotton—unless, that is to say, the elasticity of its demand for cotton in terms of its own goods is equal to unity—such a change in the product supply prices of enterprise will take place.

In discussing the size of the primary effects that may be set up in this third way, there are three things to be taken into account. The first is the size of what will be called the *initial reaction*. This is the alteration that the fall in the supply prices of cotton causes in the amount of their own goods (and hence, other things being equal, in the amount of their enterprise and labour) that the entrepreneurs and workmen in the rest of industry spend on cotton. Since to change the volume of employment takes time, this alteration must be brought about at first by means of an equivalent transfer of product wages and profits from the purchase of other goods to the purchase of cotton, or *vice versa*. But after a time it may be kept up by means of a change in the size of the output. Hence the second thing to consider is the extent to which the alteration continues to be the mere result of a transfer of enterprise-demand and effort-demand from (or to) non-cotton goods, and the extent to which it gives rise to a net change in the output. The third thing is the extent to which this net change in the volume of output, and hence in the volume of employment of efficiency-units of labour, involves a change in the number of workmen; and that

will depend on how much the change reacts on the intensity of work.¹

(a) *The "initial reaction"*

The change that the fall in cotton supply prices will cause in the amount of non-cotton goods spent on cotton depends on three factors. The first is the elasticity of the demand of the rest of industry for cotton. It is this factor alone that determines whether the amount of other goods spent on cotton will remain unchanged, increase, or decrease; for according as the elasticity is greater than, equal to, or less than unity, the amount of other goods spent on cotton will increase, remain unchanged, or decrease. Moreover, other things being equal, the more the elasticity exceeds unity, the more will the amount of other goods spent on cotton increase, or the more it falls short of unity, the more will the amount spent decrease. The second factor is the amount by which wage-rates are lowered, and hence the amount by which the supply prices of cotton fall.² The greater this fall is, the greater,

¹ Until this third point is discussed, it will be assumed in speaking of the volume of employment that the number of efficiency-units of labour performed by any workman remains the same. That is, the addition of a workman, plus the allied increases in working capital and enterprise, would involve the same increase in total output as it would have done if the fall in cotton wage-rates had not occurred.

² This fall in cotton supply prices (in terms of other goods) would be represented geometrically by a lowering of the whole supply curve. In calculating the new position of this supply

other things being equal, will the initial reaction be. The third factor is the elasticity of the short-period supply of cotton. The greater this is, the larger, given the other two factors, will be the initial reaction. It should be noticed that this change in the amount of other goods spent on cotton will not have reached its full extent until the reactions that it sets up on employment in the rest of industry have worked themselves out. For until that has happened the aggregate income of the rest of industry will be changing in size, and as it does so, the amount of it spent on cotton goods is likely to change accordingly. In order that this point may be taken into account, the elasticity of the demand of the rest of industry for cotton must not be calculated till the fall in the supply prices of cotton have had their full effects on the amount demanded. Thus in connection with the initial reaction it is possible to lay down two propositions: firstly, whether the other industries will increase, decrease, or leave unaltered, the amount of their wares spent in buying cotton, will depend solely on whether the elasticity of their demand for cotton exceeds, falls short of, or is equal to unity; and secondly, given that this elasticity is greater than unity, the resulting

curve of cotton in terms of other goods, account must be taken not only of the fall in the cost of producing cotton, but also of the alteration, as the volume of output (and of employment) of the cotton industry changes, in the quantity of other goods desired by the cotton industry.

effects on the volume of employment in the rest of industry only to the extent that it does not depend on an equal alteration in the opposite direction in the demand for other goods. It will, in fact, be wholly offset, and there will therefore be no primary effects at all, unless the fall in cotton supply prices affects the willingness of the entrepreneurs in the rest of industry to provide their service; and it will only do this if it causes the utility yielded by the marginal unit of enterprise there to alter. If this does alter, entrepreneurs will thereby be given an inducement to change the volume of their employment.

The lowering of cotton supply prices means that for the marginal unit of enterprise in the rest of industry there is a rise in the quantity of goods offered. But that does not necessarily involve a rise in the quantity of utility offered. It may involve a rise, a fall, or no change whatever; for though the marginal unit of enterprise devoted to obtaining cotton by the entrepreneurs in the rest of industry will add more to the total cotton they receive than it did before, it may add less utility, since the increments of cotton resulting from intra-marginal units will be greater also. We know the answer when we know the elasticity of the entrepreneurs' demand for cotton; that, in fact, is merely one way in which the answer is stated. The gross utility obtained in the rest of industry on the marginal unit of enterprise used in getting cotton (while the total amount of

enterprise so used remains the same) will be greater than before if this elasticity is greater than unity, and less than before if it is less than unity; and since the disutility caused by supplying the marginal unit of enterprise will be the same as before, the net utility will be greater in the first case and less in the second.¹

It is now easy to see within what limits the primary effects on the volume of output (and hence employment) in the rest of industry must lie. To begin with, that part of the initial reaction which is due to a change in the proportions of their given product wages that the workmen spend on the different goods will not give rise to any primary

¹ These facts can be brought into clear light with the aid of a diagram. Along Ox measure units of enterprise, along Oy utility, and along Oz disutility.

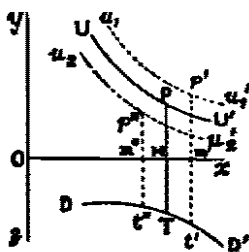


FIG. 5.

Then UU' is the curve of the marginal utility of enterprise, and DD' is that of the marginal disutility. (The slope of UU' depends on how rapidly the marginal utility of income and the marginal prime profit of enterprise decline as the amounts of income and enterprise are increased; it is therefore calculated in relation to given conditions of wages, interest, and technique.) In equilibrium, the marginal utility and the marginal disutility of enterprise will be equal.

That is, PM will equal TM , and the amount of enterprise will be OM . If the marginal utility curve is raised to u_1u_1' , the amount of enterprise will increase to Om' , where $p'm' = t'm'$; and if the marginal utility curve is lowered to u_2u_2' , the amount of enterprise will fall to Om'' , where $p''m'' = t''m''$.

effects at all, since the change in the amount spent on cotton will be balanced by an equal change in the opposite direction in the amount spent on other goods; it will be merely a transfer of effort-demand from one thing to another.¹ We may therefore confine our attention to the change in the enterprise-demand.

Let us examine first the conditions that would have to be satisfied if this initial reaction on the enterprise-demand for cotton is to continue to be a mere transfer of demand—that is, if the volume of employment in the rest of industry is to stay unchanged. There are two possibilities to consider: because of the fall in cotton supply-prices, entrepreneurs in the rest of industry may either spend more enterprise on cotton than they did before, or they may spend less. If, in the first place, the elasticity of their enterprise-demand for cotton is greater than unity—that is, if they *increase* their expenditure of enterprise on cotton—this initial reaction will set up no change at all in the volume of employment only if they decrease their expenditure on other goods by the same amount. But if they do that, the total amount,

¹ It should be noticed, however, that this transfer will influence the final ratios of interchange between cotton and other goods, and that while it cannot give rise to primary effects, it not only will react on the distribution of employment between the cotton industry and the rest of industry in the first instance, but also may set up secondary effects on the volume of employment in the rest of industry that will partly cancel the primary effects arising in other ways. (See below, II. ii. 2.)

and thus the marginal disutility, of their enterprise will be unchanged; hence they will do it only if also the marginal utility of enterprise is unchanged; and in these circumstances the marginal utility of enterprise will be unchanged only if the utility derived from the marginal unit of non-cotton goods is the same, notwithstanding the reduction in the quantity of these goods consumed. If, in the second place, the elasticity of their enterprise-demand for cotton is less than unity—that is, if they *decrease* their expenditure of enterprise on cotton—the initial reaction will set up no change at all in the volume of employment only if they increase their expenditure on other goods by the same amount. In that event the marginal disutility of enterprise (the total amount of enterprise being the same as before) will be unchanged; and they therefore will do it only if also the marginal utility of enterprise is unchanged—that is, only if the utility which they derive from the marginal unit of non-cotton goods is the same as before, notwithstanding the increase in the quantity of these goods consumed. Thus entrepreneurs in the rest of industry will *not* alter their expenditure on non-cotton goods by the same amount as they alter that on cotton—and the initial reaction *will* cause a change in the volume of employment—unless the marginal utility to them of non-cotton goods (in effect, since the marginal utilities of expenditure on the different goods will be equal, the

marginal utility of real income) remains the same however much is consumed;¹ and this is very unlikely. It therefore follows that the initial reaction on the rest of industry will not be wholly transfer expenditure, and that there will be primary effects of the same kind on the volume of employment. In other words, if the elasticity of the demand for cotton of the entrepreneurs in the non-cotton industries is greater than unity, employment in these industries will somewhat expand, and if that elasticity is less than unity it will somewhat contract. For the part of the given marginal composite product, at each point, needed to call forth the enterprise will in the first case be less, and in the second case greater, than it would have been apart from the fall in cotton supply prices; the marginal net product of labour in those industries in the first case will be raised, and in the second case will be lowered.

Let us consider next the conditions that would have to be satisfied if the initial reaction on the enterprise-demand for cotton is not to consist at all of transfer expenditure but is to give rise to an equal change in the volume of employment. If, firstly, that reaction is positive (that is, if the entrepreneurs spend more of their goods than

¹ In terms of the diagram (Fig. 5) this means that the fall in the supply prices of cotton would have failed to make UU' shift; the marginal utility of enterprise would still be PM , and the marginal disutility would still be TM .

before on cotton), it will cause an equivalent increase in output only if entrepreneurs in the rest of industry spend on non-cotton goods the same amount of their enterprise as before; and since, if they do that, the marginal utility of their expenditure on those goods (and hence—the marginal utilities of expenditure on all goods being equal—on goods in general) will be the same, they will do it, in fact, only if the short-period supply of enterprise can be increased, by the amount required to produce an extra output equal to the initial reaction, without causing a change in the disutility of enterprise. If, secondly, the initial reaction is negative (that is, if the entrepreneurs spend fewer of their goods than before on cotton), it will cause an equivalent decrease in output only if the entrepreneurs in the rest of industry spend no more enterprise in buying non-cotton goods than they did before. And since the marginal utility to them of non-cotton goods (and hence of goods in general) will in that event be unchanged, they will spend the same amount as before, in fact, only if the marginal disutility of enterprise remains the same, notwithstanding that the total quantity of enterprise will have fallen by the amount represented in the negative initial reaction. Thus output will alter to the full extent of the initial reaction only if, to the right of the former equilibrium point in the first case, and to the left of it in the second, the curve of the marginal disutility of enterprise is a

within the limits of the initial reaction.¹ Within these limits their size depends on the factors that we have been examining; it depends on how fast, as the amount of enterprise is increased, the marginal utility of enterprise diminishes and the marginal disutility increases. The more quickly the marginal utility of enterprise falls and the marginal disutility rises, the less, other things being equal, will the volume of employment change;² and the marginal utility of enterprise will fall the more quickly, the faster the marginal utility of income and the marginal prime profit of enterprise diminish, as the amounts of income and enterprise grow larger. This statement can be made simpler if, instead of speaking of the rate of fall in the marginal utility of income and of the rate of rise in the marginal disutility of enterprise, we bring these two factors together and speak of the elasticity of the enterprise-demand for income. We can then say that given the fall in cotton supply prices, the primary effects on the volume of employment in the rest of industry—whether they involve an increase or a decrease—will, other things being equal, be

¹ In Fig. 6 the amount of enterprise, while becoming either larger or smaller than OM, will not become as large as Om', or as small as Om''; it must lie within the limits of OM and Om' in the first case, and of OM and Om'' in the second case.

² As the curves are drawn in Fig. 6, the amount of enterprise will change from OM to Os (where $rs = sk$) or, as the case may be, to Os' (where $r's' = s'k'$), and employment will alter correspondingly. Other things being equal, the steeper the curves, the smaller will the change be.

less, the more nearly the enterprise-demand for cotton is equal to unity, and the less elastic are the demand for and the supply of real income in terms of enterprise.

(c) *Reactions on the intensity of work*

These reactions on the volume of output may be regarded as equivalent to reactions on the volume of employment of "efficiency-units of labour. Even when the primary effects in this sense are known, we have therefore still to find out what change will be involved in the number of workmen. For it cannot be taken that the number of units of labour done by the average workman will remain the same; that is, it cannot be taken that after the fall in the price of cotton has taken place, the addition of a workman, to any given number at work, would increase output by the same amount as it would have done before.

The extent to which the given change in the volume of employment of efficiency-units of labour will involve a change in the number of workmen rests on the decisions both of the entrepreneurs and of the workmen. For it partly depends on whether it would be more profitable for the entrepreneurs to vary their output by altering the number of men or by altering the amount of work done by each; ¹ and it also partly depends on how the average employed workman will respond to the change caused by the fall in the price of cotton in the marginal utility of his labour. This

¹ See above, I. iv. 2.

response of the workmen will depend on how elastic their effort-demand is for real income; and this elasticity, in turn, will depend on how fast the marginal utility of income falls, and the marginal disutility of effort rises, as more income is obtained and more effort is applied. The greater this elasticity, the more, other things being equal, will the change in the effective amount of labour be met by the existing staff's altering the total number of units of work it does, and the less, therefore, will be the change in the number of workmen.

II. *Secondary effects*

So far we have assumed that all industries other than the cotton industry are homogeneous—that they produce only one kind of commodity. On this assumption the only reactions that the fall in the supply prices of cotton would cause on the volume of employment in these other industries would be those which we have already examined. But actually there are many industries besides the cotton industry, each of which produces a different commodity. Because of this fact, those changes in the non-cotton industries which we have been discussing may possibly themselves give rise to a further reaction; they may conceivably reproduce themselves in secondary effects on the volume of employment.

The way in which this may happen, and the factors that limit the extent to which it will happen, can be seen most easily if we now picture the non-

cotton industries as consisting not of one industry only but of two (say, bootmaking and watchmaking), and if also, to begin with, we suppose that in one of these industries (bootmaking) the changes hitherto examined do take place, while in the other (watchmaking) they do not. Let us start by recalling what changes in the boot industry the fall in the supply prices of cotton will cause. This fall means that in order to buy a given quantity of cotton, bootmakers (entrepreneurs and workmen alike) will have to give fewer boots. According as the elasticity of their demand for cotton is greater or less than unity, they will therefore spend more or fewer boots than before in buying cotton. At first they will have a precisely equivalent number fewer or more, as the case may be, for other purposes. The resulting disparity between the marginal utility and the marginal disutility of enterprise and of work will cause them to alter the volume of their output: in the first case this will increase, and in the second case it will decrease. The accompanying changes in the volume of employment are what we have called the primary effects. But while these changes in output will partly cancel the alteration in the number of boots left over for other uses after the purchase of cotton, they will not cancel it altogether; since, as we have seen, the changes in output must always be smaller than the changes in the amount spent on cotton. Hence even when the primary effects have taken place, the bootmakers, according as the elasticity of their

demand for cotton is greater or less than unity, will still, after buying their cotton, have fewer or more boots than before left over for other uses.

Now if all the boots that they spend on cotton were worn by the cotton-makers themselves, and if all those which they do not spend on cotton they themselves wore, this change would not alter the demand for watches;¹ and the only reaction on the volume of employment in the non-cotton industries would be the primary effects. But since there are other consumption goods besides cotton and boots, the change in the number of boots spent on cotton will involve a change not only in the number that bootmakers themselves wear, but also in the number that they spend on watches. Thus if they increase the number of boots that they spend on cotton, they will spend fewer on watches, and if they reduce the number that they spend on cotton, they will spend more on watches. It follows that if the elasticity of the demand of the bootmakers for cotton is greater than unity, their demand for watches will fall; and if it is less than unity, their demand for watches will rise. Hence in these circumstances the fall in the supply prices of cotton (or, as we may say alternatively, the rise in the cotton industry's demand for boots) will not only cause a change in the volume of employment in the boot industry, but will reproduce itself in a shift in the demand of this industry for watches, and thus

¹ This is, of course, precisely the state of affairs that would exist if the non-cotton industries really were homogeneous.

will give rise to secondary effects on the volume of employment in watchmaking. And since watchmakers will then have more or fewer watches than before to spend on other goods, their demand for those goods will rise or fall, and there may, therefore, be a further reaction on the employment of other non-cotton industries; and so on.

The factors that determine whether employment in watchmaking in the conditions assumed will increase or decrease, and that determine how large the change will be, are obviously those which have been examined in discussing the primary effects on the volume of employment in bootmaking. Let us suppose, first, that the elasticity of the bootmakers' demand for cotton is greater than unity, and that their demand for watches therefore falls. Then, if the elasticity of the demand of watchmakers for boots is greater than unity, fewer watches will be spent on boots than before, and more will be left over for other purposes; the utility of the marginal unit of enterprise will therefore, for reasons given earlier,¹ fall below the disutility, and output and employment will decline. But if the elasticity of the watchmakers' demand for boots is less than unity, the number of watches spent on boots will increase, and the number left over for other uses will decline; so that the marginal utility of enterprise will be higher than the disutility, and output and employment will therefore expand.

¹ See above, pp. 113-15.

Hence, when the primary effects involve an increase in employment, the secondary effects may involve either an increase or a decrease. If, in the second place, the elasticity of the boot-makers' demand for cotton is less than unity, so that their demand for watches therefore rises and their employment falls, the reactions on employment in watchmaking will be the reverse of those just stated. Thus it follows that whether the primary effects cause the volume of employment in the non-cotton industries to contract or whether they cause it to expand, the secondary effects may cause it to alter in the same direction or in the opposite direction; they will cause it to alter in the same direction in some industries and in the opposite direction in others. And we should therefore not expect the *net* secondary effects on the volume of employment in all the non-cotton industries taken together to be very large in either direction.

Nevertheless, if we continued to suppose that the primary effects occur in only a few of the non-cotton industries, we should expect the secondary effects in each of the others to be considerable, and we should be likely to exaggerate the size of even their net effects. When, as happens in practice, each of the non-cotton industries (and not merely the one) is individually reacting to the fall in cotton supply prices, each (and not merely the one) will be offering more or fewer of its own goods for exchange, at the former ratios of interchange, against other non-cotton goods.

Thus it well may happen that after the change in the expenditure on cotton and the primary effects on output have taken place, the quantity of its goods that each industry will wish at the old ratios of interchange to spend on other non-cotton goods, may buy precisely those quantities of them that, at the same ratios of interchange, these other industries will be wanting to sell to it; and in this event there will be no secondary effects whatever.¹

This state of affairs will exist if three conditions are satisfied. The first is that the elasticity of the demand for cotton should be the same in the

¹ Along Ox measure numbers of boots and along Oy numbers of watches. Then the curve OB represents the terms at which bootmakers are willing to trade aggregate numbers of boots for aggregate numbers of watches, and the curve OW represents the terms at which watchmakers are willing to trade aggregate

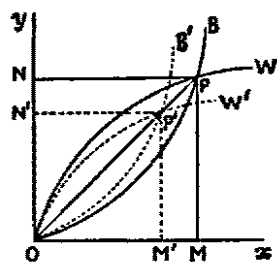


FIG. 7.

numbers of watches for aggregate numbers of boots. In equilibrium OM boots will be given in exchange for ON watches, and the ratio of interchange of boots and watches—that is, the price of boots per unit in terms of watches—will be $\frac{ON}{OM}$.

Let us suppose that the changes induced by the fall in the supply prices of cotton shift the bootmakers' curve to OB' and the watchmakers' curve to OW' . If the point of intersection of these two curves (P') lies on the straight line joining P (the former point of intersection) and O , bootmakers will wish to trade, at the former ratio of interchange, precisely the same number of boots as the watchmakers will wish to buy; OM' boots will be exchanged for ON' watches, and there will be no secondary effects at all on the volume of employment.

different non-cotton industries, so that they will all change the amount that they spend on cotton by the same proportion. The second condition is that the elasticities of supply of all goods other than cotton should be the same, so that, as a result of the primary effects, all the non-cotton industries will change the size of their output by the same proportion. And the third condition is that the total expenditure of each industry on non-cotton goods should be distributed between the various goods in the same proportions as before; and—the other two conditions being satisfied—each industry will do this only if the elasticities of its demand for the different goods are the same.

Neither of the first two conditions is likely to be unsatisfied to any serious extent. Cotton is a consumption good; and even if it were consumed solely by the rich or solely by the poor, the demand for it in the different industries would probably not be markedly different, since all industries have their rich and their poor. Again, the elasticity of supply *in the short period* is likely to be roughly, though of course not precisely, the same in one industry as it is in another. On the other hand, the elasticities of demand for the various goods will clearly be different, and the third condition will therefore not be fully satisfied. Hence it would be wrong to expect the amounts of its goods that each industry will wish to trade, at the former ratios of interchange, to be precisely equal to the amounts that the other industries will wish to buy. There will therefore be a change in

the ratios of interchange, and secondary effects will be set up on employment. But while these reactions will result in a relative increase in employment in the industries in which the ratio of interchange has become more favourable, they will result in a relative decrease in those in which it has become less favourable; for in the first group the marginal utility of enterprise and of work will have risen, and in the second group it will have fallen.¹ Thus it seems reasonable to conclude that the secondary effects will not be

¹ If the demand curve for watches in terms of boots shifts from OB to OB' , and that for boots in terms of watches shifts from OW to OW' , bootmakers will wish to sell, at the old ratio of

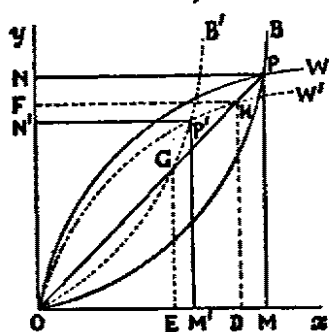


FIG. 8.

interchange $\frac{ON}{OM}$, OE boots (since OB' cuts OP at G), but watchmakers will wish to buy OD boots (in exchange for OF watches). The ratio of interchange will move in favour of bootmakers, and OM' boots will be given for ON' watches, at a ratio of $\frac{ON'}{OM'}$. Thus

bootmakers will spend on watches EM' more boots than they had intended, and will

have less left over for other purposes; and watchmakers will spend on boots FN' less watches than they had intended, and will have more left over for other purposes. Hence the marginal utility of enterprise will rise in bootmaking and will fall in watchmaking; and employment in bootmaking will increase, and in watchmaking will decrease, compared with what it would have been otherwise.

large, and that when we are concerned with the *total* volume of employment we can safely neglect them; the only changes that need be taken into account are the primary effects.

III. *Conclusions*

By comparing the size of the change that the lowering of wage-rates in the cotton industry would cause in the volume of employment in the rest of industry, with the size of the change that it would cause in that of the cotton industry itself, we can reach certain conclusions regarding how much the volume of employment would be altered in the aggregate. Now except in the very unlikely event that the fall in the supply prices of cotton will not affect the consumption of cotton at all, the volume of employment in the cotton industry is sure to expand; in the rest of industry it will expand or contract according as the quantity of other goods traded against cotton is greater than before or less than before—that is, according as the elasticity of the demand of the rest of industry for cotton is greater or less than unity. Hence, in order to find the aggregate change in the volume of employment in all industries taken together, the change in the non-cotton industries must in the first case be added to that in the cotton industry, and in the second case be taken away from it.

Let us consider first the case in which the change in the quantity of non-cotton goods spent on cotton (or, in other words, the initial reaction

in the non-cotton industries) is an increase. In this case there will be an increase both in the quantity of non-cotton goods spent on cotton and also in the quantity of cotton spent on non-cotton; and the increase in both will be greater, the more elastic the demand for cotton is.¹ But the proportionate increase in the quantity of other goods spent on cotton will be as great as that in the quantity of cotton spent on other goods only if, at the former ratio of interchange, the demand of the rest of industry for cotton is infinitely elastic.² In practice, however, it is sure to be

¹ In what follows, it is assumed, alternatively, either that the cotton industry produces solely for the rest of industry, or that the elasticity of its demand for cotton is the same as that of the rest of industry for cotton.

² Along Ox measure cotton goods, and along Oy their price per unit in terms of non-cotton goods. Let DD' represent the demand of the rest of industry for cotton (in terms of non-cotton goods), and let SS' represent the supply prices of cotton (in terms of non-cotton goods). Then OMP non-cotton goods will exchange against OM cotton. Let SS' , as a result of the lowering of wage-rates in the cotton industry, fall to ss' . Then the quantity of cotton exchanged against non-cotton goods will increase from OM to OM' , and the quantity of non-cotton goods exchanged against cotton will increase

from OMP to $OM'P'B$. The increase in the quantity of non-cotton goods exchanged will be in proportion to that in the quantity of cotton exchanged only if $P'M'$ equals PM —that is, only if PP' , the part of DD' that lies between SS' and ss' , is horizontal. The nearer it is to being so, the more nearly equal will the proportionate increases be.

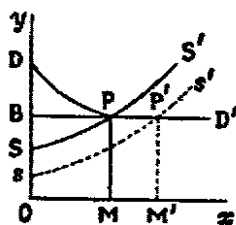


FIG. 9.

less elastic than that; and therefore the proportionate increase in the quantity of non-cotton goods exchanged for cotton is bound to be somewhat less than that in the quantity of cotton exchanged for non-cotton goods. Moreover, since the elasticity of supply in the short period will be roughly the same in the non-cotton industries as it is in the cotton industry, and since, therefore, it would require roughly the same proportionate increase in employment in the non-cotton industries as it would in the cotton industry to yield a given proportionate increase in the quantity of product traded; it follows that even if employment in the non-cotton industries increased enough to produce *all* of the additional goods spent on cotton, it would increase less than employment will in the cotton industry. But we have already seen that as a rule the increase in employment in the non-cotton industries will not nearly be large enough to produce all of the additional goods spent on cotton;¹ and it will therefore, even if the demand for cotton is very elastic, be much less than—perhaps less than half as great as—the increase in employment in the cotton industry.

Secondly, if the elasticity of the demand for cotton is less than unity, and the quantity of other goods spent on cotton therefore diminishes, the volume of employment while expanding in the cotton industry will contract in the rest of industry; and the expansion in the cotton industry will

¹ See above, pp. 115-17.

be less, and the contraction in the rest of industry will be greater, the less elastic the demand is. The net decrease in employment in industry as a whole will be at its maximum if the demand of the rest of industry for cotton is rigid. For then not only will the decrease in the rest of industry be at its maximum, but the increase in the cotton industry will be at its minimum—it will be nil. Nevertheless, since the net reduction in the volume of employment in the non-cotton industries will be smaller than the volume that corresponds to the decrease in the quantity of their goods spent on cotton, the net reduction in industry as a whole, even in this extreme case, will be less than it would be if the amount of labour employed in making non-cotton goods for the purpose of buying cotton, were reduced in proportion to the fall in cotton supply prices (which, since wages are not the only prime cost, will itself be less than the proportionate fall in wage-rates); and in less extreme cases it will be less than that. The condition that the fall in wage-rates should leave the aggregate volume of employment unaffected is not that the elasticity of the demand for cotton should be equal to unity, but that it should be equal to something a little less than unity; for if it is equal to unity, the volume of employment, while in the non-cotton industries remaining unchanged, will in the cotton industry slightly increase.

CHAPTER III

REACTIONS CAUSED BY THE CONCURRENT LOWERING OF OTHER WAGE-RATES

HITHERTO we have been discussing the reactions on the volume of employment that would be caused by lowering wage-rates in a single industry; but from now on we shall be concerned with a general lowering of wage-rates. At the beginning of Part I it was suggested that when wage-rates are lowered in all industries at the same time, the alteration in the volume of employment caused by lowering wage-rates in a single industry will be different from what it would have been if other wage-rates had remained unchanged. Our next step must therefore be to see how such a difference could be brought about, since the factors that govern its size will also influence the size of the net alteration in the volume of employment that would be caused by the general lowering of wage-rates.

I. *Two preliminary difficulties*

We must begin by clearing away two difficulties. The first is the practical difficulty—when wage-rates are fixed by collective bargaining—of getting a general lowering of wage-rates accepted.

Depressions usually fall most heavily on the instrumental industries.¹ But since the demand for instrumental goods in times of depression is especially inelastic,² the pressure to lower wage-rates tends to be greatest in precisely those industries in which the demand for labour is least elastic, and hence in which wage reductions can do least to increase employment. Demands for a reduction in the wage-rates of other industries, since the pressure is not so great there, are often successfully resisted. But in the present chapter this difficulty of *securing* a general reduction in wage-rates will be ignored; it will be assumed that machinery exists for altering wage-rates as a whole, and that a reduction takes place in all wage-rates concurrently.

The other difficulty is that the effects of lowering the wage-rates of any single industry will partly depend on how long is required for the reactions to take place, compared with the length of time required for the corresponding reactions caused by lowering other wage-rates. But since there is no reason for expecting that the wage reductions that involve increases in aggregate employment will be quicker or slower in producing their effects than those will be that involve decreases, this fact will have no significant influence on the net alteration that the lowering of wage-rates will cause in the total volume of employment; and it will therefore be neglected.

¹ See below, II. iv. 3.

² Cf. Robertson, *Banking Policy and the Price Level*, p. 17.

While the lowering of all wage-rates concurrently may on balance cause the volume of employment to increase, that of some of the individual rates may cause it to decrease; or *vice versa*. This may be true as regards the lowering of wage-rates in the cotton industry. But in order to simplify the wording we shall suppose that it does not apply. This simply means that, in discussing how the alteration in the volume of employment caused by lowering wage-rates in the one industry alone (that is, in the cotton industry) will be modified if other wage-rates are lowered at the same time, we shall be referring to an industry that in this respect is typical, not exceptional.

II. *Reactions on the change in employment in the cotton industry*

Let us consider first how the concurrent lowering of other wage-rates may modify the alteration in the volume of employment in the cotton industry itself. It may do so in two main ways: by making, first the demand for cotton, and second the rate of fall in the marginal net product of labour in cotton-making (as more labour is taken on) different from what they would have been otherwise. In discussing the first of these two reactions it must be recalled that if wage-rates were lowered in the cotton industry alone, the increase in the quantity of cotton that would be bought by the rest of industry (and hence the increase in the volume of employment in

cotton-making) would be largely due to the resulting cheapening of cotton in terms of other goods. But when there is a concurrent and equivalent lowering of other wages, this relative cheapening of cotton will not occur. The fall in the general level of wages may cause the ratios of interchange between the various goods to alter somewhat, because the elasticities of the demand for and supply of some goods may be different from those of others; but it is certain that cotton will not be cheapened in terms of other goods as much as it would have been if other wage-rates had remained unchanged. Thus the lowering of wages in the cotton industry will cause employment in cotton-making to increase less than it would have done otherwise. On the other hand, since the profits and wages that would have been spent on cotton will be spent on other goods instead, employment in the non-cotton industries will be greater to an approximately equivalent extent. Hence this factor, though it will lessen the increase in the volume of employment in the cotton industry, will not substantially alter the volume of total employment.

The other way in which the general lowering of wage-rates will modify the increase in employment that would otherwise have taken place in the cotton industry itself, is by altering the rate of fall in the marginal net product of labour in cotton-making as more labour, because of the fall in cotton-makers' wages, is taken on. In the first place, at the same time as the volume of

employment in cotton-making is reacting to the lowering of wage-rates in the cotton industry, it will also be reacting to that of wage-rates in other industries. Hence according as the general wage reduction causes the volume of employment to increase or to decrease, the average volume of employment in cotton-making, when the reactions caused by lowering wage-rates in the cotton industry take place, will be greater or smaller than it would have been otherwise. Now it has been argued above that as the quantity of labour employed in an industry in the short period increases, the marginal net product of labour diminishes at an increasing rate.¹ From this it follows that according as the general wage reduction causes the total volume of employment to increase or to decrease, the marginal net product of labour in cotton-making, as the lowering of their wages brings more cotton-makers into work, will be made to fall faster or more slowly than it would have fallen otherwise.² The

¹ See pp. 81-91.

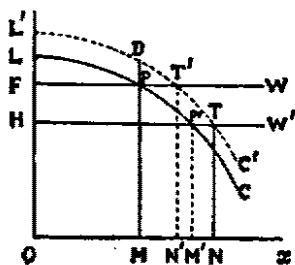


FIG. 10.

² Suppose that as a result of the concurrent lowering of other wage-rates, the curve of the marginal net product of labour in the cotton industry is raised, by the vertical distance LL' throughout, from LC to $L'C'$. If the wage-rates of cotton-makers had remained unchanged at FO (FW being the former wages curve), this would have increased employment in the

increase in employment in cotton-making will therefore in the first case be less, and in the second case greater, than it would have been if other wage-rates had remained unchanged; and this means that the net change (whether increase or decrease) that the lowering of cotton-makers' wages will cause in employment in industry as a whole will have been made smaller.

In the second place, at the same time as the fall in wage-rates of cotton-makers is causing the volume of employment in cotton-making gradually to swell, the demand for short loans in the rest of the industry will be growing more quickly if the general wage reduction causes aggregate employment to increase, and less quickly if the general reduction causes aggregate employment to decrease, than it would have done otherwise. Hence, as more cotton-makers are gradually taken into employment, the cost of short loans to the cotton industry will grow more rapidly in the first case, and less rapidly in the second, than it other-

cotton industry from OM to ON'—*i.e.* by MN'. But the lowering of wage-rates in the cotton industry alone (by FH) would have increased it from OM to OM'—*i.e.* by MM'. The concurrent lowering of *all* wage-rates actually increases it from OM to ON, or by MN. Hence if the lowering of cotton-makers' wages is to have the same effect as it would if other wages had remained unchanged, MM' must be equal to N'N; that is, the straight line (not shown in the diagram) joining D and T must be parallel to the corresponding straight line joining P and P'. But the steeper LC becomes, the less does the given vertical rise in it cause it to shift to the right; and hence the condition is not satisfied.

wise would have done; and as a result, the marginal net product of labour in cotton-making in the first case will fall more quickly, and in the second case will fall less quickly, than it would have done apart from the lowering of wage-rates in the non-cotton industries. Thus for this reason also the net alteration in the total volume of employment (whether increase or decrease) caused by lowering wage-rates in the cotton industry will be smaller if other wage-rates are lowered concurrently than it will be if they remain unchanged. Whether the difference will be important or unimportant depends on whether the supply of short loans is very inelastic or very elastic.

III. *Reactions on the change in employment in other industries*

Consider next how the concurrent lowering of other wage-rates may modify the alteration that the lowering of wage-rates in the cotton industry would otherwise cause in the volume of employment in the non-cotton industries. In examining this second group of modifications we must first recall how it is that the lowering of wage-rates in the cotton industry does cause the volume of employment in other industries to alter. It does so by lowering the supply prices of cotton in terms of other goods. For according as the elasticity of their demand for cotton is greater or less than unity, entrepreneurs in the non-cotton industries will spend more or fewer of their goods (and thus of their enterprise) than before in buying cotton,

and will therefore have fewer or more left over for buying goods in general. Hence the fall in the supply prices of cotton has the effect of causing the marginal utility of their enterprise in the first case to rise, and in the second case to fall. The extent of this rise or fall will depend, firstly, on how elastic the demand for cotton is—and therefore on how much less or more of their product they will have for spending on non-cotton goods; and secondly, it will depend on how elastic is their enterprise-demand for real income. In other words, according as the elasticity of the demand for cotton is greater or less than unity, the fall in cotton supply prices will cause that amount of product in the non-cotton industries which is required to call forth the marginal unit of enterprise, to fall or to rise, and thus the marginal net product of labour in these industries to rise or to fall.

Now if the elasticity of the enterprise-demand for cotton is greater than unity—that is, if the lowering of wage-rates in the cotton industry causes the volume of employment in industry in general to expand—then output and profits in the non-cotton industries, when the effects of lowering wage-rates in the cotton industry take place, will on the average be greater than they would have been otherwise, owing to the lowering of wage-rates in the non-cotton industries themselves. For we have assumed that the lowering of wage-rates in the cotton industry alters aggregate employment in the same direction as the general

lowering of wages does. Hence the rise in the marginal utility of enterprise, which will occur when entrepreneurs in the non-cotton industries withdraw part of their product from expenditure on non-cotton goods to expenditure on cotton, is likely to be less than it would have been otherwise; since the quantity of non-cotton goods that they will be consuming will have been made greater by the lowering of other wages. If, on the other hand, the elasticity of the enterprise-demand for cotton is less than unity, the fall in the marginal utility of enterprise, which will occur when entrepreneurs in the non-cotton industries withdraw expenditure from cotton to other goods, is likely to be less than it would have been otherwise; since the quantity of non-cotton goods that they will be consuming before they make this transfer of expenditure will have been made less by the fall in profits resulting from the general lowering of wages.

From these arguments it follows that the change in the volume of employment in the non-cotton industries that will be caused by lowering wage-rates in the cotton industry, is in both cases likely to be less than it would be if other wage-rates were not altered also. Nevertheless, there does not appear to be any reason for expecting that these modifications will be important.

Our conclusions on the whole subject of the modifications that the lowering of all wage-rates concurrently will cause in the change in the volume of employment that would otherwise

result from lowering those of the cotton industry, are therefore as follow : first, that all the causes of modification, in so far as they occur at all, will operate in the same direction—all will tend to make the change in the volume of employment smaller than it would be otherwise ; and second, that these various modifications, with the possible exception of that depending on the elasticity of the supply of short loans, are not likely to be very important.

CHAPTER IV

EFFECTS OF REMOVING THE ASSUMPTIONS

THE extent to which a general lowering of wage-rates would alter the volume of employment has now been shown to depend on four general factors: first, on how steeply the curve of the marginal net product of labour in each industry is inclined negatively;¹ second, on how elastic is the demand—in terms of other goods—for each of the individual commodities; third, on how elastic are the enterprise-demand and effort-demand for real income;² and fourth, on how elastic is the supply of short loans. But the discussion has hitherto been based on certain assumed conditions;³ and these must be brought into conformity with the conditions of the actual world. In doing this we shall be discussing some of the forces that determine what the nature

¹ The factors on which the slope of the curve depends were examined in I. iv.

² It is important to distinguish between the second and third of these factors, since, as we have seen already and as will be emphasised presently, the wage reduction, though general, is not likely to cause the prices of all goods to be lowered in the same proportions.

³ See above, pp. 100-02.

and size of these general factors are likely to be in practice.

I. *An "open system"*

When wage-rates are lowered by one country in a group of countries, the position is analogous to that in which they are lowered by one industry in a country, or by one firm in an industry. If, in each case, conditions elsewhere remained unchanged, each—the country, the industry, the firm—would find the volume of its employment increased. For the lowering of its wage-rates would enable it to charge lower prices for its goods, and so to capture part of the trade of the others. Since the products of the different industrial countries compete with each other to a marked extent as direct substitutes, it might therefore be thought that a small fall in the prices charged for English exports would cause a large increase in our sales abroad,¹ and hence in employment at home—initially in the export industries, and later as a result in other industries as well; and so long as the prices charged by our competitors remained unchanged, this would be so. But because industrial depressions usually fall with considerable severity not on one country only, but on all, it would be idle to pretend that prices elsewhere would remain unchanged; a lowering of wage-rates, and therefore export

¹ That is, the elasticity of the demand for our exports, if calculated on the assumption that conditions elsewhere remained unchanged, would be very great.

prices, in this country, would almost certainly give rise to an equivalent lowering of those of our chief competitors.¹

At first sight one might expect that if other countries just kept pace with us in cutting wage-rates, and hence export prices, and so succeeded in baulking our endeavours to seize part of their share of the export trade, the position would be on all fours with that which would exist if the system were actually closed. But in post-war conditions it is almost certain that the result would be more unfavourable than that. The reason is that most European countries have recurring monetary obligations to meet abroad. Now, a world depression is associated with falling world prices. Hence to meet a given monetary debt abroad, the excess of commodity exports of the debtor countries over their commodity imports must, with the depression, expand; exports must increase or imports must decrease. Each of the debtor countries therefore in various ways tries to restrict imports; and by doing so it makes the need for the others to do likewise more and more urgent. Creditor countries are not prepared to take advantage of the opportunity afforded by this state of affairs to get the same (or a larger) volume of imports for a smaller volume of exports. For while they would gain by getting their imports cheaper, they would lose

¹ This view is supported by what happened after the 1926 wage reductions in the coal-mining industry. Cf. Bellerby, *Coalmining: a European Remedy*, pp. 31-36.

by having their depression made worse—at first in their export industries, and later in their other industries also. In these circumstances, the elasticity of the demand for exports, during a time of world depression, is probably very slight.¹

If this view is correct, a lowering of our wage-rates, in so far as it fell on the export trades, would have very adverse effects on the volume of employment. It would do little to increase employment in these industries themselves, and it would indirectly do much to decrease it in other industries. Initially, it would involve a transfer of income from workmen to entrepreneurs; but this increase in profits would very soon, under conditions of competition, be handed on to consumers. These to a great extent are foreigners who, *ex hypothesi*, increase their purchases of English goods hardly at all. Thus the lowering of wage-rates in the export industries would mean not merely a redistribution of purchasing power but also a destruction of it; far from removing unemployment it would tend to aggravate it.

It is easy to see that this adverse reaction on the volume of employment would be considerable. If the fall in export prices did not induce foreigners to buy any more of our exports at all,

¹ That is to say, the elasticity of the demand is probably very slight if, in calculating what it is, time is allowed for the lowering of our supply prices to react on the supply prices of competitors, and hence for the full effects on the quantity of our goods demanded to show themselves.

the amount of labour engaged in producing for export would be the same; and the total income of that part of the export industries that produces for actual export (and not for home consumption) would be reduced by approximately the amount of the reduction in its wages bill. The amount that this part of the export industries spends on the products of other industries (in effect, since exports are turned into imports, the amount of *imports* that it spends on other goods) would fall by almost an equivalent amount—a little less than the full amount because it would also reduce its consumption of imports. The proportionate fall in the quantity of these other products given in exchange would not be quite so large, since there would probably be a resulting slight readjustment in the ratios of interchange against them; but there is not much doubt that it would be nearly as large; and output and employment in these industries would fall correspondingly.¹

¹ We can form a rough idea of the order of magnitude of the change in the volume of employment that would be involved, by reasoning in this manner. If the wage-rates of workmen producing goods that are to be exported were lowered by (say) 10 per cent., there would be a fall of about 10 per cent. in their aggregate wages. Now since wages (and salaries) form something like half the national income (*vide* Bowley and Stamp, *The National Income in 1924*, pp. 46-50), the aggregate income earned in connection with goods exported would fall by roughly 5 per cent. Therefore the amount spent on the products of the other industries—and the quantity of these other products given in exchange, and hence also the quantity of them produced—would fall correspondingly. But if we take it that, of the total

II. *A monetary system*

A second important consideration is introduced by taking account of the fact that contracts (including wage-rates) are expressed in terms not of the product of the particular industry concerned, but of money.

If entrepreneurs hoard—that is, refrain for a given length of time from consuming or exchanging—the same proportion of the product transferred to them by the lowering of wage-rates as the workmen would have hoarded, this redistribu-

output, about four-fifths are consumed at home and one-fifth is exported, it follows that four-fifths of the reduction in the income of the exporting group would come off goods produced for home consumption. That is, the fall in the amount of their income spent on these home goods would be four-fifths of the reduction in their total income; or, in other words, it would be 4 per cent. of their former income. The percentage fall in the output of the industries producing for home consumption would be only one-quarter of this percentage; for though the actual fall in output would be about equal to the fall in the amount of income spent by the exporting group in buying goods from them, the total output would be four times as large as that of the exporting group. That is to say, the output (and hence the employment) of the home industries would fall by one per cent.; and thus the volume of employment throughout industry as a whole would fall by a little less than one per cent.

It must be remembered that we are here concerned with a barter system; for it will presently be argued that the reaction on employment in a monetary system would be more unfavourable than this. But, on the other hand, it must also be remembered that when wage-rates are lowered, the depression is supposed to be very severe in all countries; it is solely because of this that the demand for our exports would be so very inelastic.

tion of purchasing power, in a closed system, will be a redistribution merely, and not a destruction. Now a general lowering of wage-rates, if they and other contracts were expressed in terms of the relevant product, would not increase the inducement to hoard goods rather than to invest them in production. It would do so only if it made entrepreneurs as a whole less keen to invest, by making them keener to hold value in the form of a stock of goods; and it would do that only if the value of goods as a whole was expected to rise. But if the value of a unit of each commodity were expressed as a quantity not of money but of other goods that it would buy, a general rise in values would be impossible; one thing could go up in value only if another went down to an equivalent extent. When, however, contracts are in terms of money, the position is different. It may then be that the lowering of wage-rates will increase the inducement to hoard rather than to invest; for it may cause the value of money to rise, and so make entrepreneurs keener to hold value in the form of money. Such a result is not inevitable, as the monetary authorities might try to avoid it; but they are unlikely to do so in fact.

The reason why they are unlikely to do so is as follows. The first result of the lowering of wage-rates is that entrepreneurs will have to pay out less money in the form of wages. They will therefore have to borrow less from the banks. If they borrowed an equivalent amount extra for

their own consumption or for installing new capital goods, this need make no difference. But they are not likely to do so unless the banks take active steps to induce them to. If the banks do not take such steps, those who have overdrafts are likely, in the conditions of depression assumed, to take the opportunity afforded by the wage reduction to reduce them. They are not likely to increase their purchases of equipment unless the subsequent fall in their supply prices leads to a considerable increase in their sales; and in any event there would be some delay. Moreover, it is not likely that, at a time when they are already in debt to the banks, they will borrow in order to expand their consumption. Even those who have credit bank balances are likely to wait, before increasing either their consumption or their productive capacity, to see what effect the fall in wages will have on their profit and loss accounts. By so doing they will cause the level of prices to fall, and this will increase the inducement to hoard; for, in effect, it will involve an equivalent rise in the general level of product wage-rates, and so will act as a deterrent to production. As the price level falls (that is, as the value of money rises), the inducement to hoard value in the form of money will increase.

This result is not inevitable, since it may be a principle of banking policy to prevent it. If that is so, the banking system will try to offset the increase in the stimulus to hoard (that is, the increase in the tendency for the volume of active

money to shrink) by providing an equal counter-stimulus to spend more freely (that is, by providing an equal increase in the opposing tendency for the volume of active money to swell); it will deliberately attempt to stabilise the price level. If it succeeds, it will prevent the wage reduction from inducing a rise in the value of money, and so will avoid the destruction of purchasing power that would otherwise result. But if, as seems more usual, such a banking policy is lacking, much of the purchasing power that by the wage reduction is taken away from the workmen will be destroyed by the process of being transferred to the entrepreneurs. And in this event there will be an adverse reaction on the volume of employment compared with what there would be under a system of barter. But of course all will depend on what the nature of the monetary policy is.

III. *Instrumental industries*

Fluctuations in the demand for consumption goods are associated with fluctuations in the demand for instrumental goods. But for well-known reasons the resulting fluctuations in industrial activity are relatively much larger in the instrumental industries than they are in the consumption industries. For in order to bring about an increase in the supply of a consumption good, when the demand for it has risen, a roughly similar percentage increase will be needed in the instrumental goods used in producing it. But

because most machines are fairly durable, there will at any time be a considerable stock of them already in existence. Thus if the total stock is to be increased by a given percentage, the annual output must be increased by a much larger percentage; with the result that the proportionate increase in industrial activity will be greater in the instrumental than in the consumption trades. During times of depression, the machines manufactured during the preceding boom will continue in existence, and so will make any considerable output of new ones unnecessary. As Professor Pigou writes: "the upward fluctuation of industrial activity above the normal carries with it a subsequent downward fluctuation below the normal when the stimulus is removed, and not merely a subsequent return to the normal. For, in effect, in depressions a rival supply is called out that has been piled up in booms. . . ." ¹ Hence, during times of considerable depression, the demand for instrumental goods will be very inelastic; ² a reduction in the prices of these goods would have little effect in stimulating the demand.

This is well illustrated by what has happened in shipbuilding since the war. The need for more ships at the end of the war caused the industry to expand.³ For a short time there

¹ *Industrial Fluctuations*, p. 102.

² Cf. Robertson, *Banking Policy and the Price Level*, p. 17.

³ The Committee on Industry and Trade calculate that "the annual shipbuilding capacity of the United Kingdom in the

was great activity in building; but by 1921 war losses had been replaced, and since then the industry has been severely depressed. Thus while the average annual launchings of the period 1920-21 were 1,797,000 gross tons, those of the period 1922-26 were only 968,000 gross tons. By 1922 the world's tonnage was over 30 per cent. greater than in 1914, but the volume of overseas trade was smaller.¹ Hence much tonnage was laid up. According to the Committee on Industry and Trade, the world's laid-up tonnage was 10,984,000 gross tons in January 1922, and was still 4,076,000 in January 1927. Any tendency during that period for freights to rise (the precursor of a rise in the demand for ships) therefore meant a reduction in laid-up tonnage, rather than increased activity in building. Despite a fall of over 20 per cent. in the numbers of insured workmen in the industry, the average annual unemployment percentage at the end of July for the seven years 1923-29 was 31.8.²

In these circumstances, the removal of the assumption that each of the industries whose wage-rates are lowered consists of all the processes in making and marketing a particular consumable good, brings out a further important

post-war period may be placed at about 3 million gross tons, an increase of about half a million tons over the pre-war figure" (*Survey of Metal Industries*, p. 383).

¹ Cf. Committee on Industry and Trade, *Survey of Metal Industries*, pp. 383-85.

² *Statistical Abstract for the U.K.*, No. 75, pp. 102-3.

consideration. For the industries the demand for whose products is especially inelastic are precisely those in which the depression is likely to be most severe—that is, those in which the disparity between the ruling and equilibrium wage levels is the greatest—and in which a lowering of money wage-rates is therefore most likely to occur. Unemployment will not, in fact, be about equally severe in all industries, but will be heaviest in the instrumental and allied industries and in the unsheltered industries. A reduction in wage-rates that was confined to these industries (and in practice, as post-war experience shows, they would tend to be thus confined) would almost certainly, owing to the inelasticity of the demand for the goods which they make, do much damage to employment in the rest of industry. Applying here the argument that was used in connection with the export industries, we should expect that the number of men who would be thrown out of work in other industries, as a result of a wage reduction in the instrumental industries, would not be quite as large as the product got by multiplying the number formerly employed in the instrumental industries by the proportionate fall in their wage-rates. But in a very severe depression the demand for large classes of instrumental goods might be so inelastic as to cause it to be very nearly as large.

IV. *Sheltered and unsheltered industries*

But by removing the assumption that each of the industries whose wage-rates are lowered consists of all the processes in making and marketing a particular consumable commodity, we are led to distinguish not only between instrumental and consumption industries, but also between unsheltered and sheltered industries; and in connection with this latter distinction there are two points to be discussed. In the first place, although unemployment in the post-war period has been heavier in unsheltered than in sheltered industries, and although, therefore, the wage reductions that have occurred have been mainly in the unsheltered industries, they may occur—and in a general wage reduction they of course would occur—also in the sheltered industries. Now, by lowering the prices of sheltered goods, a lowering of wage-rates in the sheltered industries would bring about a fall in the costs of production in the unsheltered industries. This fall in unsheltered costs would be especially marked in cases in which particular sheltered industries are in any way supplementary to unsheltered industries, which is true of railway transport; but it would occur to some extent in most unsheltered industries, since it would make it possible to lower product wages in those industries without at the same time lowering real wages. But though this lowering of unsheltered costs would help the unsheltered industries, it

must not be too readily assumed that it would increase the volume of employment in industry as a whole. For in so far as each of the unsheltered industries sells its products abroad, and does so in face of a very inelastic demand, employment in all other industries would be affected adversely; and to this extent, therefore, the effect would be much the same as it would be if the wage reduction took place in the unsheltered industries themselves.

In the second place, however, it is possible that some of those sheltered industries that are least depressed are working so little below their normal productive capacity that the lowering of wages might increase, not only their demand for labour to work their given equipment, but their demand for equipment itself. In so far as it does this, it will raise the demand for instrumental goods at the same time as it lowers their costs; and by so doing it will tend to bring the short period to an end. To the extent that it does take place, this stimulus to investment will tend to increase the volume of employment both directly and indirectly. Directly, it will increase the output of the instrumental industries; and indirectly, it will tend to offset the fall in the price level that, as we have seen, the fall in wage-rates will be likely to bring about by increasing savings.

V. Conclusion

We may conclude that in conditions of severe,

world-wide depression the elasticity of the demand for most commodities, and of the enterprise-demand for real income, is probably, owing to the pessimism with which such conditions are usually associated, abnormally small. In the first place, the demand for individual commodities is liable to be abnormally inelastic for the reason that, in such circumstances, all classes are liable, in buying for consumption, to be unusually cautious. And in the second place, the enterprise-demand for real income is liable to be artificially reduced by the tendency of entrepreneurs suffering from depression to underestimate future conditions of profit-making; for it must be borne in mind that enterprise is supplied in return not for an agreed profit, but for an expected profit. Moreover, the additional considerations introduced into the argument by removing the original assumptions have led to the conclusion that, in conditions of world-wide depression, the lowering of wage-rates would affect employment adversely in three important respects. For at the same time as it lowered the wage cost directly, it would indirectly, by promoting a fall in the price level, cause it and other costs cumulatively to rise (though this result might be partly offset); and in so far as it lowered the wage cost of producers of instrumental goods and of goods for export, it would be setting up a fall in the prices of goods of very inelastic demand, and by so doing would set up a harmful reaction on employment.

Thus it seems reasonable to conclude that, in conditions of *severe and prolonged world-wide depression*, the elasticity of the enterprise-demand for real income is less than unity; and if this is so, a general lowering of wage-rates would cause unemployment to become, on balance, not less but greater.¹ At any rate there is little hope that it would benefit employment much. If this conclusion is sound, it follows that, from the point of view of the volume of employment, the level of wage-rates that actually exists is, in the circumstances, that which for the moment is the best; for by moving the level downwards, as well as by moving it upwards, employment would be made worse. And it also follows that, as a measure for restoring equilibrium between the actual level of wages and the equilibrium level, a lowering of money wage-rates cannot be regarded as a true alternative to a rise in the level of prices. For while the aim of a lowering of money wage-rates would be to lower product wage-rates to equality with the equilibrium marginal net product of labour (and thus to get rid of unemployment), and while a lowering of money wage-rates would in fact cause product wage-rates directly to fall, it would probably, owing to the various reactions discussed above, indirectly cause product wage-rates to rise and the curve of the marginal net

¹ Cf. Robertson, *Minutes of Evidence before the Committee on Finance and Industry* (1931), Vol. I. p. 324; and also Keynes, in *Minutes of Evidence*, Vol. II. p. 53.

product of labour to fall, thereby causing the disparity between the actual and equilibrium levels of wage-rates to grow larger. Other things being equal, a *net* lowering of product wage-rates would cause the volume of employment to increase: the difficulty is that a lowering of money wage-rates would not be an effective way of bringing it about; and, moreover, it would cause other things (the marginal net product of labour) to change adversely.

PART III

THE ADJUSTMENT OF WAGE-RATES TO THE PRICE LEVEL

CHAPTER I

THE UNILATERAL ADJUSTMENT OF WAGE-RATES

A WAGE reduction may aim either at preventing large-scale unemployment from arising, or at removing it when it already exists. We have just seen that when used in the second of these ways it is liable to do more harm than good; it is a dangerous medicine to take at an advanced stage in the growth of the disease. But it does not necessarily follow from this that it should never be used at all. Thus the above conclusion must not be taken as justifying the wage-fixing authorities in a policy of inaction when, for any reason, the demand for labour is only just beginning to alter. There may still be room for using wage adjustments as part of a scheme for co-ordinating wage-rates with the price level.

It is to this aspect of the subject that we must now turn. We shall assume that (monetary policy being given) variations take place in the demand for labour, and hence in the equilibrium level of wage-rates; and we shall inquire how far the resulting unemployment could be prevented by means of the unilateral adjustment of wage-rates to these conditions of a fluctuating

price level. Later on in this Part, the assumption that monetary policy is "disharmonious"¹ will be dropped, and we shall then consider how both the level of wages and the level of prices would behave if they were co-ordinated with each other.

It is clear from what was said in the preceding chapter that a lowering of wage-rates would, in fact, be more effective in preventing unemployment than in removing it. For the argument that it might make the depression worse was partly based on the fact of its being very severe already. It was held that the demand for the individual commodities, especially for exports and instrumental goods, and the enterprise-demand for real income, become more and more inelastic as depression gradually deepens. From this it follows that, other things being equal, as the depression does get worse, the effect that a wage reduction of a given size would have in increasing the volume of employment may be expected to become smaller and smaller. In the same way, as a boom gradually grows, and those elasticities of demand therefore tend to become greater, the effect that a given rise in the level of wages would have in checking the boom becomes smaller and smaller also. Hence, if wage-rates are to be adjusted to the conditions of a fluctuating price level in the most effective way, they must be altered as soon as a disparity between the actual and equilibrium wage levels

¹ See above, pp. 5-6.

begins to show itself; readjustments must take place quickly.

In considering how far it is economically desirable that wage-rates should be lowered in order to curb a depression, we must remember that a wage reduction would cause a fall in the incomes of the workmen still employed. The disadvantage that it would cause in this way must be set against the benefit that it would yield by lessening unemployment. We can then say that the wage reduction should be carried up to the point at which a very small additional reduction would cause less advantage than disadvantage. Hence the less effective a reduction of a given size is in preventing unemployment, the smaller, given the size of the disparity between the ruling and equilibrium wage levels, should the actual reduction be. Therefore, since a reduction of a given size will be less effective the severer the depression is when it takes place, it follows that the reduction that is economically desirable will become smaller and smaller, in proportion to the size of the disparity between the ruling and equilibrium wage levels, as the depression grows more and more severe. If the wage level is to be adjusted to the fluctuating price level in the best way, the reduction in wage-rates must be made at the most suitable time—which is early in the growth of depression—and its size must be the best in relation to those circumstances.

We are here concerned with a wage reduction

that is part of a normal policy of keeping wage-rates adjusted to the price-level. Such a reduction would be more effective in preventing unemployment than a reduction of the same size would be if made haphazard. The reason is that in these circumstances wage-rates would move in both directions, not only downwards; for while they would be lowered in times of depression, they would be raised in times of boom. By checking the expansion, the upward movement of wages in times of boom would cause the factors making for later contraction to be less powerful; since the over-development of the instrumental industries would be less marked, and the swing to pessimism (the over-optimism being less) would not be so great. Thus the raising of wage-rates in times of boom would make their lowering in the early stages of the following depression more effective; and it would therefore also make it larger in proportion to the size of the disparity. Moreover, if wage-rates were variable in both directions, the disadvantage that would have to be set against the advantage would be smaller; for in this event the disadvantage would not be that the level of wages over good and bad times taken together would be lower; it would simply be that it would fluctuate. For this reason also, the size of the desirable reduction in wage-rates would be greater, in proportion to the wage disparity, than it would be if the reduction were haphazard.

Nevertheless, the demand for at least instrumental goods (and, in post-war conditions, the demand for exports) is likely to be inelastic even when a depression is only beginning; for the causes that make it inelastic during the worst phases of depression begin to operate in the earliest phases. Furthermore, wages are only one element in costs; and therefore, even if entrepreneurs were able to count on wage-rates being plastic, their enterprise-demand for real income would still lose a great deal of its elasticity with the coming of a fall in the monetary demand for their goods. We may therefore conclude that while a cut in wage-rates would do something to check the depression, it would not do a great deal.¹

However, given that the price level does fluctuate in such a way as to cause the equilibrium level of wage-rates to be unstable, it is better that the actual level of wage-rates should be made to adapt itself to these conditions than that it should not. For though the benefit that would thus be gained, through a lessening of unemployment, would probably be small compared with the total unemployment that the instability of the equilibrium wage level causes, it would be very considerable absolutely; it is a benefit that we should try hard to obtain.

¹ Professor Pigou has suggested that "wage policy as it actually is, contrasted with wage policy as it might be, is responsible for adding something of the order of one-eighth to the amplitude of industrial fluctuations" (*Industrial Fluctuations*, p. 285).

CHAPTER II

A METHOD FOR THE UNILATERAL ADJUSTMENT OF WAGE-RATES

IN trying to work out a suitable method for bringing about the general wage readjustments that are made desirable by fluctuations in the price level, we shall be faced by a number of problems. By studying these problems, we shall find out what are the main characteristics that such a method must possess if it is to be satisfactory.

I. The need for a single authority

In the first place, we must inquire more fully into the way in which the movements in the general level of wage-rates would be made up of movements in the individual rates. In this connection it is tempting to argue that, if the changes in the general level of wage-rates are to be satisfactory, the changes in the individual rates must bear the same proportion to each other as they would under conditions of perfect competition; for in those conditions, each workman who accepted a cut in wages, and each entrepreneur who granted a rise, would do so only

because he would lose if he did otherwise. But the result would be that the cut in wage-rates would tend to be greatest in those industries the demand for whose products is most inelastic;¹ that is, it would be greatest in the industries in which a cut in wages would increase total employment least. Hence, since our object in trying to readjust wage-rates is to lessen the unemployment that is caused by fluctuations in the price level, it follows that the readjustments that would take place under conditions of competition would not be made up in the most suitable way.

If the wage agreements reached in the separate industries were not co-ordinated, the readjustments that would take place under conditions of collective bargaining would be made up even less suitably. In these conditions, each industry

¹ At first sight this statement may appear to be contradictory. For the cut in wages would tend to be greatest in those industries whose employment has fallen off most; and we know that the amount of a thing demanded will contract *less* if the demand for it is inelastic than it will if the demand is elastic; that is, we might think that the industries suffering most from unemployment are those whose products (and therefore labour) are subject to the most *elastic* demand. But this is not so. The cause of the depression must be interpreted as causing, not a movement back along given demand curves, but a *fall* in those curves throughout their whole length; and hence the change in the amounts demanded of the various commodities cannot be regarded as indicative of the *elasticities* of demand. For reasons given above, the demand for goods of inelastic demand tends to fall more during a depression, and to rise more during a boom, than does that for goods of elastic demand.

in deciding how much to alter its wage-rates would pay attention to its own needs, not to those of other industries; it would be interested in the direct reactions on its own employment, not in the indirect reactions on employment elsewhere. Thus, as under conditions of competition, wage-rates would tend to fall, in the first instance, much more heavily in industries that cater for an inelastic demand than in those which cater for an elastic demand. But whereas under conditions of competition there would be a resulting movement of labour, which would tend to drag down wage-rates in those industries in which in the first instance they fell least, under conditions of collective bargaining in the separate industries there would not be such a movement,¹ and the disparity would be maintained. Wage reductions would therefore tend to be concentrated, even more markedly than they would be under conditions of competition, on the industries in which the demand for labour is least elastic, and hence in which they would react least favourably on the volume of employment.² It follows from this that if the level of wage-rates is to be adapted in the best practicable

¹ Cf. above, p. 60, and the footnote on p. 66.

² This is a reason why fluctuations in the price level should be avoided. For in modern conditions of wage-fixing, the policy of leaving equilibrium to be restored, when the price level has fallen, by means of a lowering of the individual wage-rates, has the effect of prolonging the maldistribution of labour between the instrumental and consumption industries that characterises a depression.

way to the conditions that result from a fluctuating price level, there must be some form of central control over the separate wage-rates, in order to secure the needed co-ordination; either the various individual wage-fixing authorities must be joined federally, or there must be some unified control over them from outside.

If the only effects of changes in wage-rates were those on the volume of employment, the changes with which we are concerned in the general level of wages would be made up of larger percentage changes in the wage-rates of industries in which the demand for labour is elastic, than in those of industries in which it is inelastic. There are, however, other effects, and a policy of discrimination of this kind would be subject to certain disadvantages. In the first place, while it would be easy to lay down the general principle—that the percentage fall in wage-rates in each industry should depend on how elastic the demand for the product is—it would be impossible, without having detailed information concerning all the factors governing the reactions on employment that would follow wage reductions, to say precisely how much above or below the average the change in any particular rate should be; and it is clear that such detailed information would not be available. Besides, it often happens that the same labour produces more than one commodity. To decide in these circumstances what relation there should be between the various elasticities of demand for

goods and the resulting proportionate fall in the wage-rates of the labour producing those goods, would therefore be largely a matter of guesswork.

In the second place, the incomes of employed workmen would be made to fluctuate more widely in industries in which the demand for labour is elastic than in those in which it is inelastic. There would therefore be a harmful reaction on the distribution of labour between the different industries. For if, during times of depression, wage-rates in industries with a high percentage of unemployment were kept above those in industries with a low percentage, the tendency that would otherwise exist for labour to shift from the former kind of industry to the latter—a tendency that is socially desirable—would be checked, and would perhaps even be reversed. In effect, workmen would be encouraged to enter industries in which the demand for labour fluctuates, rather than to enter those in which it is stable. Besides, there would be the further disadvantage that the workmen in industries of stable employment would resent having their wages made more variable than those would be of workmen in industries of unstable employment.

Thus in trying to keep the general level of wage-rates in harmony with a fluctuating level of prices, we have to choose between the two different ways in which the necessary changes in the wage level could be brought about; that is, we have to choose between the method of having

equal percentage changes in all wage-rates, and the method of having larger percentage changes in the wage-rates of industries of stable demand than in those of industries of fluctuating demand. While the first of these two methods would not be as good as the other in preventing unemployment, it would be better than it in avoiding indirect losses of the kind we have been considering. Furthermore, it would be simpler to apply; and, as we shall see presently, it would make it easier to keep the task of readjusting the general level of wage-rates distinct from that of readjusting particular wage-rates. When all these points are taken into account, the method of changing all wage-rates by the same percentage is probably to be preferred.

On this part of our inquiry we may therefore conclude, firstly, that in order to keep the level of wage-rates suitably adjusted to a fluctuating price level, it would be necessary to have the changes in the wage-rates of the different industries co-ordinated, and secondly, that on the whole it would be best to make all wage-rates change by the same percentage.

II. *Periodical revision or automatic readjustment*

Our next task is to find out what criteria should be used to indicate, first, when these changes in the level of wage-rates should be made, and secondly, how large they should be.

If there is no concurrent change in the marginal net product of labour, a fall in the prices at

which entrepreneurs sell their goods will cause a fall in the *value* of the marginal net product of labour; the equilibrium wage-rate will fall below the existing rate, and the volume of employment will shrink. Or, if we think in terms of goods, we can express the same thing by saying that the change will diminish employment by raising the rate of product wages. In readjusting the general level of wage-rates so as to bring it as far into harmony with the changed price level as the circumstances allow, the aim is to prevent as much as possible of this reaction on the volume of employment from taking place; that is, the aim is to offset the changes that the fall in the selling prices of entrepreneurs will otherwise cause. Thus the condition which will indicate that a change, of the kind we are considering, in the general level of wage-rates is required, is a movement in the general level of employers' selling prices. Whenever we speak of adjusting wage-rates to the price level, it is this price level that we mean; and it is this price level that the general wage-fixing authority would use as its criterion. Since the aim in relating wage-rates to the level of employers' selling prices is to prevent unemployment, the various prices included in the price index would be weighted according to the relative importance of the goods to which they relate in giving rise to employment in their production.

A satisfactory index of this kind would be hard to compile. Since we wish it to be an

index of employers' selling prices, not of the cost of their raw materials, it would in the main be in index of the wholesale prices not of raw materials, but of manufactured goods.¹ The number of different prices and commodities to be taken into account would therefore be very large, and hence even the work of collecting the actual statistics would be a matter of great difficulty. Moreover, in determining what weight should be given to each of the prices included in the index, there would be the difficulty that, in many lines of production, the same workmen are engaged in making different commodities; and there would also be the complication that manufactured goods are very liable to alter in quality—and so to require more or less labour than before in their production—without altering in name. Nevertheless, these difficulties could probably be sufficiently overcome for practical purposes.

Granting that this is so, if changes in the prices that entrepreneurs get for their products never were associated, as either cause or effect, with changes in the marginal net product of labour, a movement in the (suitably weighted) price level of manufactured goods could be taken as an unfailing sign that a movement in the same direction was needed in the level of wage-rates; a movement in the price level would be used as the criterion, which we are seeking, to indicate *when* movements in the level of wage-

¹ For this reason none of the British indexes of wholesale prices would be suitable as they are made up at present.

rates should take place. It would be unnecessary to have any arrangement for enabling trades unions and employers' organisations to petition for a change in the level of wages, since such a change would be brought about as a matter of course. After it had taken place, the central wage authorities would not alter wage-rates again until a further change had taken place in the price level.

Changes in the wholesale prices of manufactured goods often are, however, accompanied by changes in the marginal net product of labour; for some of the factors that cause changes in the price level to occur, actually do so by causing the marginal net product of labour to change in the opposite direction. There are two factors that may act on the price level in this way. The first is a change in industrial efficiency. An increase in efficiency, in whatever way it is brought about, will cause the marginal net product of labour to rise. At the given selling prices, other things being equal, entrepreneurs will be making exceptional profits, and therefore, in order to expand their sales, they will tend to lower their prices. It may, of course, be the policy of the banking system to prevent this fall in prices from taking place; but if it is not, the index of the prices of manufactured goods will show a fall. But this fall in prices will be a result, not a cause, of disequilibrium. It will indicate not that a cut should be made in the rate of money wages, but that, in order to restore

equilibrium, a rise should occur in the rate of product wages; and the fall in prices is one way in which this rise in product wages can be brought about.

The second factor that may act on the price level by altering costs of production can operate only in countries that get a large part of their raw materials from abroad. A fall in the price level of manufactured goods in such a country as Great Britain, for example, may result from a movement of the ratio of international interchange in favour of her and against the agricultural countries from which she buys her raw materials. This is what will happen in fact if, other things being equal, efficiency in primary production increases compared with efficiency in secondary production. In that event, the cost of our raw materials in terms of finished products will fall, and the marginal net product of our labour will therefore rise. Unless the banking system takes steps to prevent it, there will be a tendency for the price level of manufactured goods to fall; and this fall will be consistent with equilibrium. In any case, if a rise in the rate of product wages is not brought about by a fall in prices, it will tend to establish itself by means of a rise in the rate of money wages.

In neither of these two cases will the fall in the level of prices of manufactured goods itself cause a fall in the demand for labour,¹ and hence

¹ But a fall in the prices of agricultural imports in terms of our exports might bring about this result indirectly. For if the

in neither case will there be a need to lower the level of wages. This fact makes the problem of adjusting wage-rates to the price level very difficult; for it means that the percentage fall in wage-rates that is made economically desirable by a given percentage fall in the price level, will not always be the same; it will depend on how the fall in the price level is caused. Therefore, in order to make sure how large the cut in wages should be, it would be necessary to wait to see how much unemployment the fall in the price level would cause; it would be necessary to wait long enough for the fall in the price level to give full evidence of its nature. But here we are in a dilemma. For if we do wait, a wage cut of a given size will, as we have seen, thereby be made much less effective in removing unemployment. Thus if we are to be sure of lowering wage-rates at the right time, we must risk lowering them by the wrong amount, or even of lowering them when they ought to be left alone; and if we are

elasticity of our real demand for agricultural products is less than unity, the fall in agricultural supply prices will mean that, while buying more agricultural imports than before, we will give fewer of our exports in exchange for them. Hence, unless the general demand for our exports is highly elastic, so that sales to other countries can be increased without causing a big drop in export prices (and we have seen that in post-war conditions this is not so), our export industries will be depressed. This, as Mr. Robertson has pointed out, is probably the explanation of a considerable part of the slump of 1921. Cf. Robertson, "A Note on the Real Ratio of International Interchange" (*Economic Journal*, June 1924, pp. 286-91).

to be sure of lowering them by the right amount, or of lowering them only when they ought to be lowered, we not only may, but certainly will, lower them at the wrong time; we may even wait too long for the lowering to benefit employment at all, and so miss our opportunity altogether.

The choice that has to be made is therefore between having the level of wage-rates readjusted automatically and having it readjusted deliberately. Under the automatic method, the level of wage-rates would be attached to the price level of manufactured goods in such a way that as soon as a change in the price level had occurred, a change in the wage level would be brought about automatically.¹ A scale of percentage changes in the rate of wages appropriate to various percentage changes in the price level would be decided upon beforehand; and it would be according to this scale that the actual changes would be made. Under the wait-and-see method it would be necessary to give to the central wage-fixing authority full powers of discretion. In making its decisions, this authority would be guided by changes both in the price level and in the volume of unemployment. A change in the price level would give it warning that a change in the rate of wages was probably required. But

¹ It is not meant that a change in wage-rates could occur only as a result of a change in the price level. Changes in the wage-rates of the individual industries would still occur, as conditions required them, without regard to the price level.

before deciding how large a change to make, it would wait to see how large a reaction there would be on the volume of employment.

Before it can be decided which of these two methods is the better, it is necessary to consider how great the relative advantages and disadvantages of each would tend to be in practice. Let us begin with the disadvantage that would be caused by having wage-rates readjusted automatically by predetermined percentages. This disadvantage is that the level of wage-rates might in certain circumstances, especially if the price index is largely made up of the prices of raw materials, be tampered with when in the interests of equilibrium it should be left alone. To the extent that this did happen, the wage level would be thrown out of equilibrium with the price level, and this would cause some degree of industrial instability. But the harmful effect would not be as great as might be supposed. For it would soon become evident to the representatives of the employers and workmen in the separate industries, that the wage-rates controlled by them needed to be changed in the opposite direction to that in which they had recently been changed by the central authority. Such a revision of wage-rates would no doubt meet a good deal of opposition, and would not take place without delay. But from the point of view of the parties to wage agreements in the separate industries, this cause of disequilibrium between wage-rates and the conditions of demand for and supply of labour in

the industries concerned, would be on the same footing as other causes of disequilibrium; and the original mistake would therefore tend to be corrected. Thus even under the automatic method of readjusting the level of wage-rates to the price level, there would be a considerable element of flexibility.

This is an important reason why the task of relating the level of wage-rates to the price level should be kept quite distinct from that of controlling wage-rates in the individual industries. In the past, attempts have been made by employers and workmen in particular industries, notably in the iron and steel industry, to deal with this problem by adopting a sliding scale of wages, under which wage-rates vary, in a defined way, with the price of the product. But to extend this system over most industries would be impossible. Apart from the great technical difficulties that would stand in the way,¹ there would be the more fundamental obstacle that the employers and workmen in each industry concerned would have to agree as to what wage-rate should be taken as the normal rate, around which the fluctuations would take place. If such agreements to have sliding scales are to provide a satisfactory means of bringing about the wage readjustments with which we are concerned, they would have to extend over at least the period covered by the trade cycle. But, as Professor Pigou has argued, "even when the two sides are

¹ See Pigou, *Industrial Fluctuations*, pp. 286-7.

agreed that such and such a wage does, at a given time, fairly conform to the normal conditions of demand, they cannot possibly be agreed that that same wage will always so conform."¹ Hence the agreements of this kind that are made in practice cover too short a period to be of much use for the purpose of relating wage-rates to the price level; they would be unsatisfactory because the standard rate, around which the fluctuations take place, can be altered only by bringing the agreements to an end. By keeping the problem of readjusting the general level of wages to the price level separate from the problem of adjusting wage-rates to changing conditions of demand for labour in the individual industries, this difficulty would largely be avoided. Thus, as we have seen, even if the general rate of wages were altered when it should not be, there would be some prospect that the mistake would be put right.

Moreover, the risk that serious mistakes of this kind would, in fact, be made could be kept fairly small. For changes in the price level that arise out of changes in industrial efficiency, or in the cost of imported raw materials, are in practice likely to be enlarged by other causes that do call for the readjustments of wages. The risk would therefore be greatly reduced if the percentage changes in wage-rates were kept smaller than would otherwise be desirable. When this point is taken into account, it seems probable that the best arrangement would be to have the general

¹ Pigou, *Industrial Fluctuations*, p. 287.

rate of wages alter by just enough to prevent fluctuations in the price level from causing fluctuations in the rate of product wages. This means that a given percentage change in the price level of manufactured goods would be followed by the same percentage change in the level of wage-rates—that is, in each wage-rate. This arrangement would have the advantage of simplicity. If conditions in any industry were such as to make a change in product wage-rates desirable, it would be brought about through the ordinary machinery of collective bargaining in that industry. Thus what the disadvantage of the automatic method of readjusting the level of wage-rates really amounts to, is that the changes would in most cases, owing to the risk that they were not required, be smaller than it would otherwise be desirable they should be.

It is in this respect that the wait-and-see method would theoretically have the advantage. But in practice it would possibly, even in this respect, be at a disadvantage; since it is unlikely that a higher degree of plasticity of money wage-rates than would be involved in keeping product wage-rates stable would be allowed by the trades unions. It is quite possible that they would not allow even as high a degree of plasticity as this. For if the fluctuations in money wages were large enough to prevent fluctuations in the rate of product wages, they would cause considerable fluctuations in the rate of real wages. The reason for this is that, in practice, the fluctuations in wholesale

prices are larger in scale than are the accompanying fluctuations in retail prices.¹ Hence the rates of real wages would fluctuate directly with fluctuations in those of money wages.²

But the size of these resulting changes in real wages would be smaller than might be expected as a result of comparing the size of the fluctuations in the retail price level with the size of those in any of the existing wholesale indexes. Such a comparison would lead to an over-estimate of the size of the induced fluctuations in real wages for two reasons. In the first place, fluctuations in the index of the wholesale prices of manufactured goods would probably be on a smaller scale than the fluctuations are in the existing indexes. The prices of manufactured goods are more heavily weighted than those of raw materials are with the price of labour; and in modern conditions the price of labour tends to be very rigid. In the second place, fluctuations in the index of retail prices would, other things being equal, be greater, if wage-rates were more plastic, than they are now. For one of the reasons why retail prices in fact do fluctuate less than wholesale prices, is

¹ The post-war figures for this country are given below, p. 198.

² Compared with the plan (which as we shall see later is used in Australia) of linking rates of money wages to the cost of living, and so of preventing fluctuations in rates of real wages, this plan for preventing fluctuations in the price level from causing fluctuations in rates of product wages, would bring about some variation in real wages, in order to secure greater stability of employment.

that they give more weight to the price of labour. Thus if wage-rates were made more plastic, the fluctuations in the retail price level would thereby be made more nearly equal in scale to the fluctuations in the wholesale price level. Nevertheless, the suggested degree of plasticity of money wages would probably make real wages fluctuate over as wide a range as the trades unions would tolerate; and thus from the point of view of securing the wage readjustments of the right size, the automatic method would be unlikely to be inferior to the deliberative method, and might even be superior to it.

As regards the relative speed with which the necessary readjustments of the level of wage-rates would be brought about under the two methods, the automatic method would be much the better. For under the wait-and-see method there would in modern conditions be a serious danger that the wage readjustment—at any rate if it is a wage reduction—would be put off for so long that it would be better for it not to be made at all. Hence while the automatic method might occasionally bring about wage readjustments that are not required, it would be much more likely than the other method to bring about those readjustments that are required; its lack of flexibility, though seemingly a disadvantage, would probably in practice turn out to be an advantage. There therefore seems little doubt that of the two methods it, in modern conditions, would be the better.

Our conclusion, therefore, is that if the price level is to be allowed to vary in such a way as to cause fluctuations in the monetary demand for labour, the best practical arrangement regarding the level of wages would probably be to make all wage-rates automatically vary directly with, and by the same percentage as, an index of the wholesale prices of manufactured goods, weighted according to the importance of the various articles in giving rise to employment. In this way, fluctuations in the price level would be prevented from causing fluctuations in the general level of product wages. Changes in the rate of product wages made desirable by changes in the underlying conditions of equilibrium would not be prevented; but they would be left to the ordinary machinery of collective bargaining.

CHAPTER III

MONETARY POLICY

SINCE wage readjustments could remove only a small part of the industrial instability caused by changes in the equilibrium wage-rate, the disadvantage of allowing the price level to vary in such a way as to make the equilibrium wage-rate alter, must be regarded as large. After taking account of all the other considerations involved, it may, therefore, be decided to prevent these variations in the price level from taking place. It lies outside our scope to examine these other considerations. But if they do lead to the adoption of such a policy, there will be some additional problems concerning wages policy still to be examined.

I. *Which price level to control ?*

In the first place, there is the question of which price level it is that should be controlled. This question is relevant here only in so far as the foregoing analysis throws light upon it. Now, we have seen that the monetary demand for labour, at any given time, depends on the value of the marginal net product of labour. In this connection there are three different price levels to

be taken into account. Given how large the marginal net product is, its value depends on the selling price; and thus in the first place there is the level of employers' selling prices, weighted according to the importance of the various commodities included in it in giving rise to employment. The other two price levels concerned are, first, the price level of raw materials, and second, that of consumption goods. These are relevant in determining what the marginal net product of labour will be: the first through its influence on the cost of the raw materials, and the second through its influence on the quantity of money required to yield the real supply price of enterprise. Thus to prevent disequilibrium it would be necessary to stabilise all three price levels. But since they would be differently weighted it may not be possible to do this completely.

The argument of the present essay does not indicate definitely which of the three it would be best to choose, and the answer must depend mainly on considerations that lie outside our scope.¹ Nevertheless, there is one point arising out of the foregoing argument that tells in favour of the consumption price level. We have seen that when industrial efficiency is changing, there is much to be said for making the price level change inversely: that is, for keeping the value of money stable in terms not of goods but of

¹ These are discussed in Keynes, *Treatise on Money* (see especially Vol. I. pp. 169-70 and Vol. II. pp. 389-94), and in Robertson, *Money*, Chap. V. § 5.

productive power. And since retail prices are weighted more heavily with labour than wholesale prices are, this result would be secured to a considerable extent by stabilising the consumption price level.¹ Under this policy, the equilibrium level of money wages would therefore vary less than it would under the alternative policy of stabilising the wholesale price level, and the necessary alteration in money wages would be less too.

II. *Greater flexibility of the rate of discount than of the rate of wages*

Factors that promote changes in the price level give a number of indications that they are beginning to operate; and the central bank, in controlling credit policy, would therefore be able to adopt corrective measures at an early stage, before the forces of disequilibrium had gathered momentum. Thus it has been suggested² that discount policy could be based not only on movements in the price level itself, but also on foreshadowings of those movements, such as: first, changes in the prices of speculative securities; secondly, variations in the relationship between (a) the volume of construction orders for future delivery and (b) the supply of construction materials becoming available, during the same period, to meet the resulting demand for them;³

¹ Cf. Robertson, *Money*, Chap. VII. § 1.

² See Pigou, *Industrial Fluctuations*, Part II, Chap. VI. §§ 6-11.

³ Cf. Hull, *Industrial Depressions*, p. 218.

thirdly, changes in the volume of stocks of finished goods held by dealers; and even, fourthly, changes in the percentage of unemployment. In this respect control over the price level would be likely to be more efficient than control over the level of wages. For wage movements could not be based on these warning signals in the way that movements in the rate of discount could. The discount rate is a flexible and sensitive instrument; and thus the central bank could proceed tentatively, finding out by experiment how much pressure to exert in order to make the conditions governing the price level respond in the desired degree. By comparison, movements in wage-rates would inevitably be clumsy and slow.

III. *Type of wage readjustment suitable for meeting non-monetary causes of fluctuation*

Disparities between the equilibrium and the actual wage levels can be caused otherwise than by a change in the price level; and this fact involves a further problem for general wage policy. Non-monetary causes of disparity can be grouped into those causes which affect the actual wage-rate and those which affect the demand for labour. Unless they are required in order to offset the effects of movements in the equilibrium wage-rate, movements in the actual wage-rate will cause disparities. If the trades unions were powerful enough, they might choose to force wage-rates above the equilibrium level;

and similarly, the organisations of employers might become able to force wage-rates below the equilibrium level. Such disparities could be offset by changing the price level in the same direction. Whether such action would be in the community's economic interests is very doubtful. But in practice the question is unimportant; for in the past, as we shall see later,¹ disequilibria have not, to any significant extent, been initiated by changes in the level of wage-rates. In so far as the disequilibria that have occurred can be correctly attributed to the desire of workmen for higher wages, they have been due to their resistance to a fall in money wages (when a rise in real wages has been brought about otherwise) and not to an active policy of forcing money wages up. That is, the rise in rates of real wages that usually goes with an industrial depression does not occur spontaneously, but results from a smaller fall in rates of money wages than in the price level.

Non-monetary causes of disequilibrium that have their effects by reacting on the demand for labour are of two kinds. In the first place, there are those which alter industrial efficiency. If industrial efficiency is improving, the equilibrium rate of product wages will rise, and there will be a tendency for the rate that is actually paid to rise also. As we have already seen, this rise can be brought about, without altering money wages, by means of a fall in the price level. But if the price

¹ Below, IV. i. 2.

level is stabilised, it will tend to come about through a rise in the rate of money wages.

In the second place, there are the non-monetary causes of disequilibria connected with the trade cycle. Because of these, the demand for labour tends periodically to rise and fall, and the equilibrium level of wages tends to show a cyclical fluctuation. The resulting industrial fluctuation could theoretically be avoided by making the price level alter inversely with the equilibrium level of wages.¹ An examination of this policy does not come within the province of this essay. For from our point of view the essence of the matter is that unless that policy is adopted (and there is no likelihood that it will be adopted) the equilibrium wage will fluctuate, and the actual wage will tend to fluctuate with it. That is, there will from time to time be a need to alter the level of wage-rates, even if the price level is stabilised; there will still be a need for the general level of wages to be adaptable.

In these circumstances a choice must be made between altering all wage-rates collectively and leaving each to find its own level. There are two considerations leading to a preference for the second of these alternatives. Firstly, if the price level were stabilised, there would no longer be a guiding principle for adjusting wage-rates automatically. A change in the equilibrium wage level would show itself in a change in the per-

¹ Cf. Pigou, *Industrial Fluctuations*, pp. 237-38.

centage of unemployment. But this would not be a satisfactory index on which to base *general* and *automatic* movements in wage-rates, because it would be difficult to disentangle the effects of general causes of unemployment from those of particular causes; that is, it would be hard to find out how far the change in the percentage of unemployment was due to a movement in the equilibrium wage level, and how far it was due to causes affecting particular industries. Secondly, it has been argued above that wage-rates could not, in practice, be collectively readjusted very frequently and by very small stages—that they could not, as it were, be made gradually to slide into position, the pressure to make them shift being taken away at the right moment. But this is precisely the sort of readjustment that would be required; for the necessary readjustment of wage-rates, following a given cause of disequilibrium, would not be a single movement, but would be a continuous series of movements, as the short period gradually merged into the long period.

We may therefore conclude that if the price level were stabilised, movements in the general level of wage-rates should be left to be brought about by the wage-fixing bodies in the individual industries. This conclusion is in conformity with that reached in the discussion of the unilateral adjustment of wage-rates to a variable price level, where it was decided that unified manipulation

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of wage-rates should be kept strictly to the task of offsetting the effects of variations in the price level; the individual wage-rates being left, apart from that, to find their own level. And if the price level were stabilised, this unified adjustment of wage-rates would of course not be needed.

PART IV
STATISTICAL VERIFICATION

CHAPTER I

GREAT BRITAIN

IN this chapter and the next, an attempt will be made to see whether certain parts of the foregoing argument are confirmed by statistics. For this purpose it will be necessary to examine the relationship that has existed in the past between wage-rates and the price level, and the extent to which changes in that relationship have altered the rates of product wages and the percentage of unemployment. The examination will relate to Great Britain and Australia.

I. Developments in wages policy

As a preliminary to this inquiry, attention must be drawn to certain modern developments in the fixing of wage-rates in Great Britain, which make a general reduction in money wage-rates, when the equilibrium wage level has fallen, more difficult to effect. Even in the past, changes in money wage-rates have lagged somewhat behind those in the equilibrium wage level; for the free play of self-interest will not bring them about until the changes in the equilibrium level have manifested themselves in the form of

either a raised or a lowered demand for labour—that is, in considerable activity of trade, or in unemployment. But in recent years wage-rates have become much less plastic than they were formerly. The essence of the matter is that conditions of wage-fixing have become more monopolistic. This result has been brought about by two developments. Firstly, nearly all wage-rates are now fixed by some form of collective bargaining, and secondly—because of the development of unemployment insurance—trades unions are able to pay less heed, in their wage bargaining, to the effects of their decisions in causing unemployment.¹

The results are as follow. Firstly, the workmen in an industry tend to be regarded as a whole. It is seen that the demand for labour in a particular industry may, in the short period, be so inelastic that total wages in that industry at the existing wage-rate exceed (especially when the unemployment insurance benefit of the unemployed is added) a somewhat lower wage-rate multiplied by the number of workmen that would obtain employment at this rate. The trade union concerned is likely, for this reason, strongly to resist a reduction in wage-rates. But secondly, of more importance than this—as a cause of obstruction to downward adjustments of wage-

¹ Cf. Clay, "The Public Regulation of Wages in Great Britain," *Economic Journal*, Sept. 1929, pp. 323 *et seq.*, and especially pp. 335-36; and also Beveridge, *Unemployment* (2nd edition), p. 369.

rates in changing conditions—is the ability of the more prosperous industries to neglect unemployment in the specially depressed industries. Thus when there occurs a fall in the demand for labour in one group of industries, the tendency that otherwise would then exist for labour to shift from these to other industries (and hence the tendency to diffuse the resulting fall in wage-rates throughout the main body of industry) is held in check. This has been a factor of considerable importance in the post-war period in increasing the rigidity of the general level of wage-rates. To express the matter otherwise, it has been a cause of the lengthening, in the specially depressed industries, of the first part of the short period.

Conditions have been such as to enable it to play an important part. With the return to the gold standard in 1925 there occurred a rise in the dollar-sterling exchange. Hence, unless markets were to be lost on a large scale, export prices in terms of sterling had to be lowered by roughly the same proportion as the rise in the exchange. The first impact of falling prices was thus upon the unsheltered industries. The effects could be transmitted to other industries only indirectly, by means of a shifting of labour and capital to the more prosperous industries; and this has been hindered by the rigidity of sheltered wage-rates. The unsheltered industries have suffered similarly through the decline in prices since 1925; for that has occurred partly as the outcome of world

conditions, and hence it has been caused partly by a fall in foreign price levels. The fall in prices, and the resulting unemployment and lowering of wage-rates, have thus been concentrated largely on the unsheltered industries.

Evidence of the disparity between sheltered and unsheltered prices is to be found in two sets of facts. The first of these is the smaller fall in retail prices than in wholesale prices.¹ For the retail index gives more weight to sheltered prices than do the various wholesale indexes; it gives more weight to rent, rates and taxes, establishment charges, and distribution expenses, all of which are sheltered prices. Secondly, a certain amount of evidence of the disparity is to be found in the unequal movements that have taken place in the various prices that make up the wholesale indexes themselves; the prices of those groups of commodities most subject to foreign competition having fallen most. Thus while in December 1929 the average of the whole ten groups of

¹ BRITISH WHOLESALE AND RETAIL PRICES, 1920-29.

	1920.	1921.	1922.	1923.	1924.
Wholesale Prices *	307	197	159	159	166
Cost of Living † .	255	222	181	171	171
	1925.	1926.	1927.	1928.	1929.
Wholesale Prices .	159	148	142	140	137
Cost of Living .	173	170	164	165	163

* Base: 1913 = 100. Cf. *Board of Trade Journal*, Feb. 1930, and *Statistical Abstract*, No. 73, p. 198.

† Figures for 1st August in each year. Base: 1914 = 100. Cf. *Ministry of Labour Gazette*, October 1929, p. 362.

commodities included in the Board-of-Trade Wholesale Index was 79.7 (1924 = 100), Cotton was 63.1, Wool was 69.3, and Coal was 75.5. But as regards cotton and wool, this evidence is very doubtful. For the list of articles quoted in the Board-of-Trade Wholesale Index is made up predominantly of raw materials; ¹ and the fall in the prices of the cotton and wool groups, especially in the latter, has been due, at least in part, to changes in the conditions of supply of those commodities in the overseas countries producing them. ²

Finally, as regards the disparity in the movements of the different wage-rates, figures published in the *Ministry of Labour Gazette* show that, while money wage-rates were at the end of 1929 still considerably above their pre-war level, sheltered wage-rates were on the average about 100 per cent., and unsheltered were only about 50 per cent., above that level. ³

The conclusions regarding post-war wages policy are that, owing to the development and strengthening of the machinery for fixing wage-rates by collective bargaining in the individual industries, and owing to the development of unemployment insurance, there has arisen a lack of connection between the wage-rates of the

¹ See Flux, *Statistical Journal*, March 1921, p. 184.

² Cf. above, p. 175.

³ Cf. *Ministry of Labour Gazette*, Feb. 1930. For figures showing the greater severity of unemployment in the unsheltered industries, see *Statistical Abstract for the United Kingdom*, No. 73, pp. 84-88.

different industries. The mobility of labour is restricted, and the adjustment of wage-rates to changes in the equilibrium level of wage-rates is thereby checked. There is therefore a strong presumption that, in modern conditions, wage-rates will not be altered in the way that would cause labour to be distributed between the different industries in the economically best proportions.

II. *The relationship between changes in the price level, product wage-rates, and unemployment*

If, in conditions of equilibrium, there occurs a change in the general level either of wage-rates or of entrepreneurs' selling prices, a disparity will thereby, other things being equal, be caused between the level of money wage-rates and the demand price per unit for the available supply of labour; and this disparity will react on the volume of employment. In analysing statistically the effects of such changes in the relationship between wage-rates and the price level, there are three principal objects. The first is to discover whether breaches of equilibrium have originated mainly in movements in the price level or in movements in the level of wage-rates; the second is to see how far, and in what way, changes in the relationship between wage-rates and the price level—by whichever of the two causes they have been brought about—have been associated with changes in the volume of unemployment; and the third is to discover (by examining the ways in which the non-initiating factor—wage-rates or the price

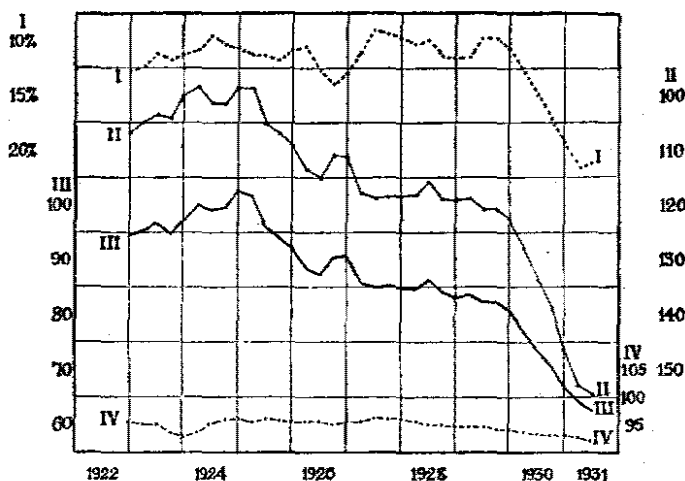
level, as the case may be—has reacted to such changes, and the extent to which the reactions have altered the volume of employment) how it should react if it is to be best adapted to the conditions. This will give an indication of how much harm is caused by allowing the disequilibria to be set up.

To the question whether changes in the percentage of unemployment in Great Britain have arisen out of changes in the demand for labour, or out of changes in the level of wage-rates, the answer given by statistics is quite definite. Over the period 1850–1910 wage-rates increased as unemployment decreased, and decreased as it increased. If the initiating factor had been changes in the level of wage-rates, the movements in the unemployment percentage would have been in the opposite directions to what they were, and the changes in wage-rates would have preceded those in unemployment, whereas, in fact, they tended to follow them. These facts are set out in Chart III (p. 207). Changes in the percentage of unemployment are shown in Curve I, and those in the level of money wage-rates are shown in Curve IV. The unemployment percentage is inverted, so that the bends in the one curve do not oppose, but fit into, those in the other.

The relationship that has existed between wage-rates and the percentage of unemployment since 1922 is equally clear. It is evident from Chart I that the variations in unemployment have not

been caused by fluctuations in the level of wage-rates, since no fluctuations in wage-rates have occurred. The difference between the pre-war

CHART I: POST-WAR GREAT BRITAIN



Data : Appendix, Table I.

- I. Unemployment percentage inverted.
- II. Index of product wage-rates inverted.
- III. Index of wholesale prices.
- IV. Dr. Bowley's index of wage-rates.

and post-war periods so far as this matter is concerned is not that in the post-war period changes in wage-rates have caused disequilibria whereas in the pre-war period they did not, but that they have not in the post-war period reacted to disequilibria, set up otherwise, whereas in the pre-

war period they did. It is simply that most of the plasticity they formerly had has been lost.

This failure of the level of wage-rates to respond to changes in the monetary demand for labour has been regarded by some as being the cause of the high level of unemployment existing in this country in the post-war period. It has been observed that a marked degree of correlation has existed between the rate of product wages (or, in other words, between the level of labour cost) and the percentage of unemployment; and it has been inferred that if wage-rates had been plastic these variations would have been eliminated, and hence that the fluctuations in unemployment would have been eliminated also.¹ The facts are shown in Chart I. Curve I is the unemployment percentage inverted, and Curve II is the inverted level of product wage-rates (that is, an index of money wage-rates divided by the index of wholesale price level and multiplied by 100).² To a very considerable extent these two curves move together. But Curve IV (Dr. Bowley's "New Index of Wages"³) shows that

¹ Cf. Rueff, *Revue d'Économie Politique*, Dec. 1925, pp. 425 et seq.

² If we were concerned with *real* wage-rates, the index of prices that would be relevant would be that of the cost of living (cf. Pigou, *Industrial Fluctuations*, p. 199). But in connection with *product* wage-rates a somewhat less inappropriate index is that of wholesale prices; though as regards both composition and weighting, this, as we have seen, is itself unsuitable.

³ See *Memorandum 12 of the Royal Economic Society*. The figures for 1923 are from the old index, lowered to 1924 = 100.

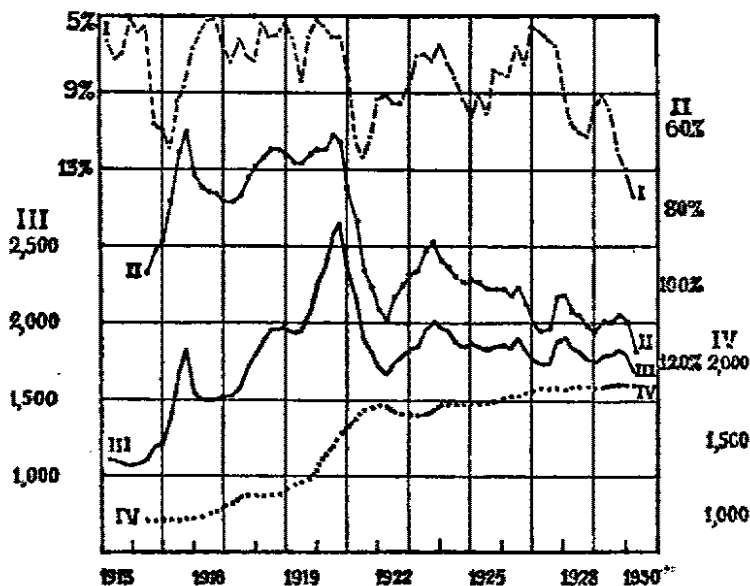
the changes that have occurred during this period in the relationship between the level of money wage-rates and the equilibrium level have not been initiated by wages policy. Notwithstanding that there have been large changes in the price level, wage-rates have remained remarkably rigid. The result is that variations in the level of product wage-rates have been brought about almost solely by variations in the level of prices. It is therefore not surprising to find that the curves of product wage-rates and wholesale prices correspond very closely—that is to say, that labour cost, other things being equal, increases as the price level falls and decreases as it rises. Thus during this period the percentage of unemployment varies closely, not only with changes in the level of product wage-rates, but also with changes in the level of wholesale prices.

Chart II shows that since 1913—the period for which quarterly figures are available—a very similar state of affairs has existed in Australia. There, the level of wage-rates, though having an upward trend, has been free from fluctuations. Hence the curve of product wage-rates (inverted) and wholesale prices have corresponded very closely, and both have had a close relationship with the percentage of unemployment.

There is nothing in these two charts themselves, or in the figures on which they are based, to indicate whether unemployment has varied with the level of product wage-rates simply because that level has varied inversely with the price

level, or whether it has varied inversely with the price level because that has varied inversely with the level of product wage-rates. But this matter is

CHART II: AUSTRALIA



Data: Appendix, Table II, Cols. I-IV.

- I. Unemployment percentage inverted.
- II. Index of product wage-rates inverted.
- III. Index of wholesale prices.
- IV. Index of money wage-rates.

of some importance. From the point of view of money wage-rates the question that matters is whether the relationship between the level of product wage-rates and unemployment would have been as close as it has if wage-rates had been

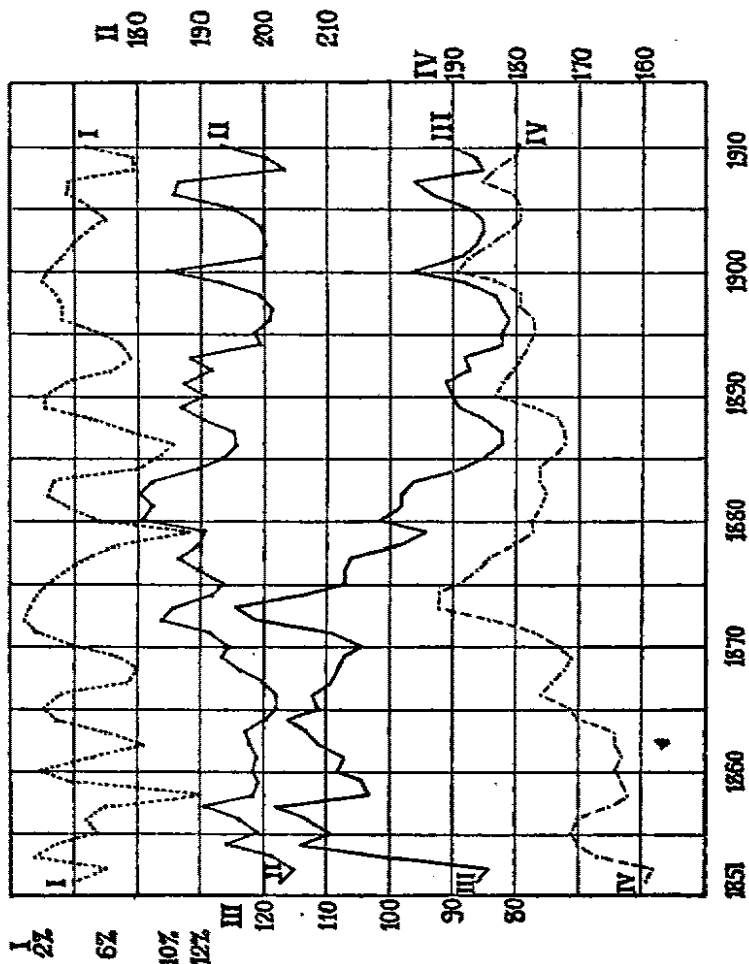
plastic. Stated otherwise, the question is whether, if wage-rates had been unilaterally adjusted to fluctuations in the price level in such a way as completely to prevent fluctuations in product wage-rates from taking place, the unemployment curve would have been smoothed out.

For reasons that will presently be clear, satisfactory statistical evidence on this matter is lacking; but a certain amount of evidence that should be examined is afforded by the conditions that existed in this country before the war, when wage-rates were more plastic. This evidence is embodied in Chart III, which relates together fluctuations in the wholesale price level, money wage-rates, product wage-rates, and the percentage of unemployment.¹ The chart shows

¹ From Curves II, III, and IV it was necessary to remove the trend. As regards Curve II (the index of product wage rates), this was done in the following way. Going backwards from 1896, 3.5 was added to the figure for 1895, 7 to that for 1894, and so on back to 1864, prior to which date 112 was added to the figure for each year; forwards from 1896, 1.5 was added to the figure for 1897, 3 to that for 1898, and so on till 1910. Curve III—wholesale prices with trend removed—was taken from Pigou, *Industrial Fluctuations*, p. 363: "The figures [in the wholesale index] are corrected for trend by subtracting 1 from that for 1895, 2 from that for 1894, and so on till 1872, prior to which date 24 is subtracted from the figure for each year; and by subtracting 1 from the figure for 1897, 2 from that for 1898, and so on to 1914."

Money wage-rates throughout the period examined show an even trend upwards. Most of this upward tendency was removed by adding 1 to the figure for 1909, 2 to that for 1908, and so on back to 1851. A certain amount of trend is still left, especially in Curves III and IV, but it is not enough to cause a comparison of the curves to be difficult.

CHART III: PRE-WAR GREAT BRITAIN



Data : Appendix, Table III, Cols. II, IV, VI, and VII.

- I. Unemployment percentage inverted.
- II. Index of product wage-rates inverted, with trend removed.
- III. Index of wholesale prices with trend removed.
- IV. Index of money wage-rates with trend removed.

that fluctuations around the trend in wage-rates fit into those in the price level to a very considerable extent. As a result, the agreement between movements in product wage-rates and movements in the price level is less exact than it is in either of the two preceding charts. Nevertheless, there is a clearly marked (inverse) relationship between movements in the price level and movements in the percentage of unemployment. This, however, is not surprising, since entrepreneurs base their decisions on what they believe the marginal net product of labour *will be*; in other words, the index of product wage-rates that is relevant is not actual wage-rates, but expected wage-rates. The

$\frac{\text{actual prices}}{\text{expected prices}}$, plasticity of wage-rates in this period was not sufficient to prevent variations in the price level from causing product wage-rates to fluctuate; so that notwithstanding the sympathetic movements in money wage-rates, fluctuations in the price level resulted to a considerable extent in inverse fluctuations in product wage-rates. Hence unemployment and product wage-rates also tended, to that extent, to move together.

Apart from the uneliminated trend, all these curves show a fairly close agreement. Thus notwithstanding the plasticity of wage-rates, the evidence contained in this chart concerning whether fluctuations in unemployment are caused by fluctuations in the price level or by fluctuations in product wage-rates, is as inconclusive as was that contained in the two preceding charts.

Indeed, as a test of the effects of the unilateral adjustment of wage-rates, this pre-war evidence is defective in several respects. First, though money wage-rates were more plastic than they are now, they were not plastic enough; they did not always change soon enough (though this fact is to some extent obscured in figures of annual average changes); secondly, the changes in the individual wage-rates were not of the right size in relation to each other; and thirdly, the index of prices is not the appropriate index.

What the chart does show clearly, however, is that even under the conditions existing in the second half of the nineteenth century, before the various methods of fixing wage-rates collectively became widespread, and before unemployment insurance on a national scale was introduced, wage-rates were not, given that the price level fluctuates, plastic in a sufficient degree. These developments doubtless aggravated the difficulty, but they did not bring it into being. If the detrimental effects of price fluctuations are to be avoided by readjusting wage-rates to the extent that is economically desirable when fluctuations occur in the price level, the level of money wage-rates must be subjected to some form of unified control; readjustments cannot satisfactorily be left to take place as a natural result of changes in the demand for labour. This was true even in the conditions existing in the second half of the nineteenth century, and it applies still more strongly to those existing now. The chart also

gives support to the view arising out of the argument of this essay, that if disequilibria between wage-rates and the conditions of demand for and supply of labour are to be avoided through the co-ordination of monetary and wages policies, control must be exercised over the price level. On this point, however, the statistical evidence is necessarily inconclusive, since no experiment in controlling wage-rates in the way suggested, and in making them plastic in the degree suggested, has yet been attempted.

CHAPTER II¹

AUSTRALIA

I. *The rigidity of wage-rates*

IN the preceding chapter statistics were given which showed that Australian money wage-rates have been very rigid. This is no doubt largely due to the methods used for determining wage-rates; industrial rates being in the main determined by some form of collective action. Many of the rates are fixed by machinery imposed by legislation. This machinery varies from State to State, but it exists in some form in all States.² The various industrial tribunals that operate under Federal and State Arbitration Acts fix both the legal minimum (or "basic") wage payable to unskilled labourers, and also the "secondary" wage, which takes account of differences in skill. Unlike the basic wage, which varies with the cost of living,³ the secondary

¹ This chapter is based on two articles that I published in the *Australian Economic Record*: the first in May 1931, and the second (in reply to a criticism by Dr. Roland Wilson in the Nov. 1931 number of the *Economic Record*) in November 1932.

² Cf. Anderson, *The Fixation of Wages in Australia*, p. 19.

³ Cf. *Labour Report*, No. 19 (Commonwealth Bureau of Census and Statistics), pp. 90 *et seq.*

wage depends partly on the economic condition of the particular industry or of industry as a whole.¹ In addition to this government machinery for fixing wage-rates, there are strong trades unions and employers' organisations. In 1928, of the estimated total number of male employees twenty years of age or over, 61 per cent. were members of trades unions. And according to the Bureau of Census and Statistics, "recent investigations show that the spirit of association is no less manifest in the case of employers than in the case of workers."²

But whatever the cause, it is clear that Australian wage-rates are very insensitive to changes in the monetary demand for labour. In Chart II (p. 205) the curve of wage-rates is very smooth, notwithstanding that in the period to which it relates large changes in the monetary demand for labour did take place. But the foregoing argument suggests that even if wage-rates had been made plastic, the damaging effects of price fluctuations would still have been large. In view of this, it will be interesting to try to find out statistically on what principles the banking system normally bases its lending policy, and especially to find out whether it takes all the steps it can, without causing the community more economic loss than gain, to prevent fluctuations in the price level from taking place.

¹ Cf. Burns, *Wages and the State*, pp. 266-67.

² *Labour Report*, Nov. 19, p. 154.

II. *The monetary system and the balance of payments*

The monetary system of Australia is closely tied to that of England. This continues to be so even though both countries are now off the gold standard; for, as we shall see presently, Australian monetary policy is still, in essence, what it was before. Each of the important banks has either its head office or a branch in London. Acting in collaboration, these banks with London offices quote rates of exchange on London. While the country was still on the gold standard, the limits within which the rate could vary were, of course, very narrow. But even within these limits it did not vary freely, as the banks showed great unwillingness to alter it.¹ And no change has been brought about in this respect by the departure from the gold standard.² It can therefore be laid down that one of the guiding principles of banking policy has been in the past, and still is in the present, that of maintaining external equilibrium without altering the rate of exchange; and thus in trying to find out on what considerations the banks base their lending policy, this principle must be taken as our starting-point.

The items on the credit side of the international account lead to the banks having a supply

¹ Cf. Copland, "The Banking System of Australia" (published in *Foreign Banking Systems*, by Henry Holt & Co.), pp. 79-80.

² During the period 16th October, 1913, to 29th January, 1931, the rates were altered only fifty times. The details are given in the *Australian Year Book*, No. 24, p. 295.

of exchange on London, and the items on the debit side lead to a demand for exchange. The supply of exchange is represented by the banks' liquid balances in London, and the demand is represented by a drain on these balances. It is evident that exchange can be kept at a fixed rate only so long as the banks have funds in London on which they are able to draw. It is true, of course, that while the country was still on the gold standard, these funds could be added to by shipments from the gold reserve. But since such a policy could not be kept up on a large scale for a long time, it is clear that the rate of exchange could be maintained unaltered only if the underlying conditions were such as to keep the international account approximately balanced; that is, it could be kept unaltered only if the volume of credit and the level of prices were made to conform to the state of the international account.

A change in the balance of payments reacts on the volume of credit automatically; the balance of payments not only automatically controls the size of the banks' liquid balances in London (and of the Australian gold reserve), but also has an automatic influence on the relationship between deposits and advances in Australia. For the factors that cause the balance of the international account to become more favourable, and so cause the London balances to increase, *automatically* cause the excess of deposits over advances in Australia to increase; and the factors that cause the balance of the international account to become

less favourable have the opposite effect.¹ The reason for this is that exports lead not only to an increase in the London banking funds (when the exporters' bills are collected), but also (at the slightly earlier date when exporters discount their bills at the banks) to the creation of equivalent deposits or to the elimination of equivalent advances. Similarly, imports lead both to a decrease in the liquid balances in London and to equivalent increases in advances or decreases in deposits in Australia. In the same way, a foreign loan increases both the London balances and the Australian deposits, and the payment of interest on it has the opposite effect. Hence, other things being equal, changes in the excess of deposits over advances—which can be taken as a rough index of changes in the volume of bank money²—would be correlated positively with changes in the balance of payments and with changes in the banks' London funds and in the Australian gold reserve. Thus it may be taken that unless the banks take *deliberate* steps to offset this automatic relation between the London balances and the volume of bank money, fluctuations in the balance of payments will cause similar fluctuations in the volume of bank money. Let us therefore pass on to consider what action (if any) the banks, as a result of the changes associated with this "automatic reaction," do take deliberately.

¹ Cf. Copland, "Australian Banking and Exchange" (*Economic Record*, Nov. 1925, pp. 17-28).

² Cf. Copland, *Economic Record*, Nov. 1925, p. 20.

III. *Deliberate banking policy*

The two principal items that are responsible for setting up changes in the balance of the international account are the value of primary exports and the volume of public external borrowing. So far as monetary policy is concerned, both of these are independent variables, and both are liable to fluctuate widely. The volume of primary exports depends largely on the bounty of nature, and the prices at which these exports are sold depend on the world conditions of demand for and supply of the particular commodities concerned. Moreover, a large part of the total exports is made up of a very small number of commodities. Thus for the five years 1922-23 to 1926-27, for example, wool averaged over 44 per cent. of the total value of exports, and wheat averaged 14 per cent.¹ The result is that the value of exports is liable to vary a great deal from year to year. In practice, this is true also of public external borrowing. And though the annual amount borrowed abroad each year could, as we shall see presently, be made to vary inversely with changes in the total value of exports, the accompanying chart² shows clearly that it has not been made to do so in the past. The total of

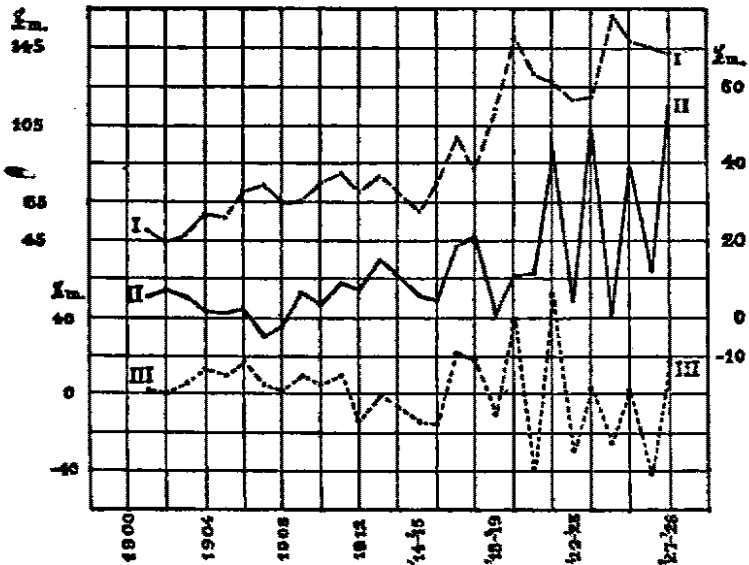
¹ These percentages were calculated from the figures of exports given in the *Commonwealth Official Year Book*, No. 21, p. 223.

² In this and the following charts all sums are expressed in terms of *Australian* currency.

the credit side of the international account is therefore liable to experience large fluctuations.

Now other things being equal, a change in the size of these items in the international account will

CHART IV



Data : Appendix, Table V, Cols. I, II, and IX.

- I. Australian exports.
- II. Public external borrowing.
- III. Balance of payments.

involve a change in the aggregate volume of the country's real income. Hence it will involve a change in the real demand for industrial products, and as a result of this there will be a fluctuation in industrial activity. The banking system may

decide to adopt a neutral attitude towards this fluctuation, neither enlarging nor lessening it; and it will do this if it allows the "automatic reaction" on the volume of credit to take place without starting up a resulting "deliberate reaction." For convenience, the fluctuation in industrial activity occurring in such circumstances will be called the *natural industrial fluctuation*. We now wish to find out whether in practice the banks, through their deliberate reaction, enlarge this fluctuation, diminish it, or leave it unaffected.

In trying to do this the first step will be to clear away a confusion. Dr. Wilson,¹ seeking to disprove my view² that the banks probably as a rule cause the natural industrial fluctuation to be enlarged, brings forward certain statistics to show that they in fact cause it to be diminished. Dr. Wilson reaches this conclusion by constructing two charts³ showing the annual rate of change in advances and securities in relation to the annual change in the excess of deposits over advances. In the first chart the comparison is direct, while in the second the advances are shown with a year's lag. On these comparisons Dr. Wilson comments as follows: "While it is evident that 'credit, in the form of advances,' does have some tendency to vary with the excess of deposits over advances

¹ "Australian Monetary Policy Reviewed" (*Economic Record*, Nov. 1931).

² Put forward in my original article (*Economic Record*, May 1931).

³ *Ibid.*, p. 210.

with a lag of from one to two years, the more significant point is that, without any lag, 'credit, in the form of advances,' has a fairly close *inverse* correlation with the excess of deposits over advances. It follows that banking funds abroad and the balance of payments should display a similar *inverse* correlation with 'credit, in the form of advances.'" And he goes on to argue that "the expansion and contraction of credit, *i.e.* advances, has been the instrument used by the Australian banks to smooth out, to some extent, the fluctuations in *total deposits* originating in irregular fluctuations in the balance of payments."¹

But the foundation for this conclusion yielded by the inverse correlation of the two series of data used by Dr. Wilson is insecure. For, firstly, if exporters and importers normally borrow from the banks on a considerable scale, most of the factors acting on the balance of payments in such wise as to produce an increase (or decrease) in deposits will also result in a decrease (or increase) in advances; since, as we have seen, exports lead *either* to the creation of a deposit *or* to the elimination of an advance, and imports to the creation of an advance *or* to the elimination of a deposit. Indeed it is precisely for this reason that it is necessary to take as our index the excess of deposits over advances. Thus inverse correlation between advances and the excess of deposits over advances is to be expected as a result of the bank-

¹ *Economic Record*, Nov. 1931, p. 215.

ing system's "automatic reaction." Moreover, secondly, the published figures of advances include those of "investments." Hence the effects of changes in the balance of payments on the volume of advances may be obscured, in the published figures, by associated changes in the proportion of advances to investments. One would expect to find this proportion showing positive correlation with changes in the excess of deposits over advances—that is, to find that in good years the banks, in order to be able to increase advances, sell securities, and that in bad years they do the opposite.¹ Hence, for both these reasons, inverse correlation between the rate of change in advances and the change in the excess of deposits over advances (and securities) cannot be accepted as evidence that the banking system, through its deliberate policy, either diminishes the amplitude of the "natural industrial fluctuation" or that it increases it; it is quite consistent with either policy. Dr. Wilson's opinion that "To some (varying) extent, therefore, the *automatic* operation of the balance of payments on the excess of deposits over advances, and hence on the price level, is offset by deliberate manipulation on the part of the banking system, which is thus able to some extent to steady prices through the influence of 'created' deposits," must therefore be set aside as not proved. Some method other than that used by him for discovering how industrial

¹ Cf. Keynes, *Treatise on Money*, Vol. II, pp. 67-68; also Leaf, *Banking*, p. 145.

stability is affected by the banking system's voluntary reaction must be sought.

General reasoning suggests (and what bankers admit concerning their policy confirms the suggestion) that the banking system causes the amplitude of the "natural" fluctuation to be enlarged. That is, when there occurs an improvement in the balance of payments (and as a result, other things being equal, an increase in the London banking funds, in the gold reserve, in the excess of deposits over advances, and so in industrial activity), the banking system heightens this boom by lending more freely to domestic industry; and when there occurs a worsening of the balance of payments it deepens the depression. This expectation is based on the view that, in deciding how much to lend, the banks try to keep a fairly stable proportion, firstly, between deposits and gold reserve, and secondly, between deposits and advances. When the balance of the international account becomes more favourable, there will, as we have seen, be an automatic increase in the proportion of deposits to advances; at the same time there will be an automatic increase in London balances, and this, by causing less gold than usual to be exported, will tend to increase the gold reserve. In these circumstances banks can safely lend more freely; and by so doing they will merely be restoring these various proportions to their former sizes. In the opposite circumstances they cannot, unless they are to alter these proportions, go on lending as freely as they have

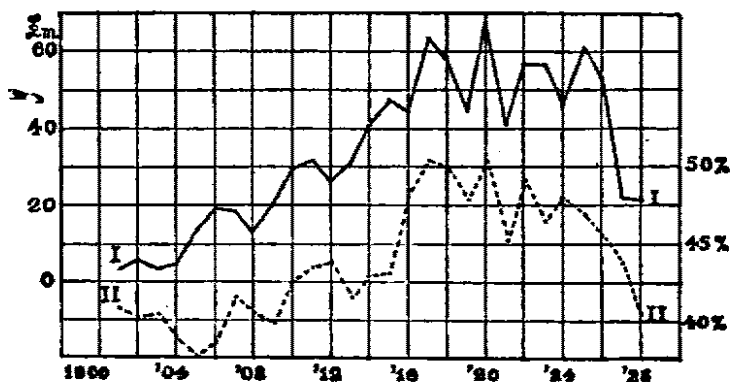
been doing hitherto. According to practical bankers, these two proportions are the criteria that are used in fact. If this is so, the banks by their deliberate action cause the "natural industrial fluctuations" to be enlarged.

Unfortunately it is impossible to verify this argument statistically, for the statistics that would be required in doing so are not available. Since the discount rate and the overdraft rate are very stable, the only test of the readiness of the banks to lend is the amount that they actually do lend. But although when the excess of deposits over advances is increasing (or decreasing) we should expect the banks to increase (or decrease) their loans still further, there is no way of finding out from the published figures whether they do so or not. For as an index of this "voluntary reaction" the published figures of advances are not to be trusted; since, as we have seen, they do not discriminate between the effects of the automatic reaction and those of the deliberate reaction.

Thus until the requisite statistics are made available, it is impossible to come to a definite conclusion regarding the deliberate reaction. But it is possible to apply a rough (though admittedly inadequate) indirect test of it. This is to see if increases in the excess of deposits over advances have been associated with heightened velocity of the circulation of money, and decreases in the excess with lowered velocity. In Chart V changes in the excess of deposits over advances are related to changes in the proportion of non-interest-

bearing deposits to total deposits, since this proportion may be taken as a rough index of the rapidity of the circulation of money. The two curves show a considerable amount of sympathy, that of the proportion of non-interest-bearing deposits to total deposits tending to lag behind

CHART V



Data : Appendix, Table IV, Cols. I and II.

- I. Excess of Australian bank deposits over advances and investments.
- II. Proportion of non-interest-bearing deposits to total deposits.

the other. The mere fact that these curves tend to move together is not in itself enough to establish our point; for the changes in the excess of deposits over advances may conceivably be brought about mainly through changes in the non-interest-bearing deposits. But the tendency of changes in the proportion of non-interest-bearing deposits to total deposits to lag behind

those in the excess of deposits over advances can be taken as presumptive evidence against this. On the whole, therefore, there appears reason to believe that the velocity of circulation does tend to vary with the excess of deposits over advances.

The significance of this must not be overestimated. As regards positive action by the banking system, the only conclusion that it warrants is that the existence of *deliberate* expansion of credit when the excess of deposits over advances is increasing, and of *deliberate* contraction when it is decreasing, would not be inconsistent with the statistics presented. But neither would the absence of such action be inconsistent, since the observed relationship between changes in the excess of deposits over advances and changes in the velocity of the circulation of money may be the result of the automatic reactions on credit associated with changes in the balance of payments. Indeed, we are here beset by the same difficulty as before, that the influence of the deliberate reaction, whatever the nature of that reaction may be, is masked by the influence of the automatic reaction.

IV. *Variations in the balance of payments and industrial instability*

But if the published statistics do not show conclusively either on what principles the banking system bases its deliberate policy or what effects this policy has on industrial stability, they do show conclusively what it does not do. While

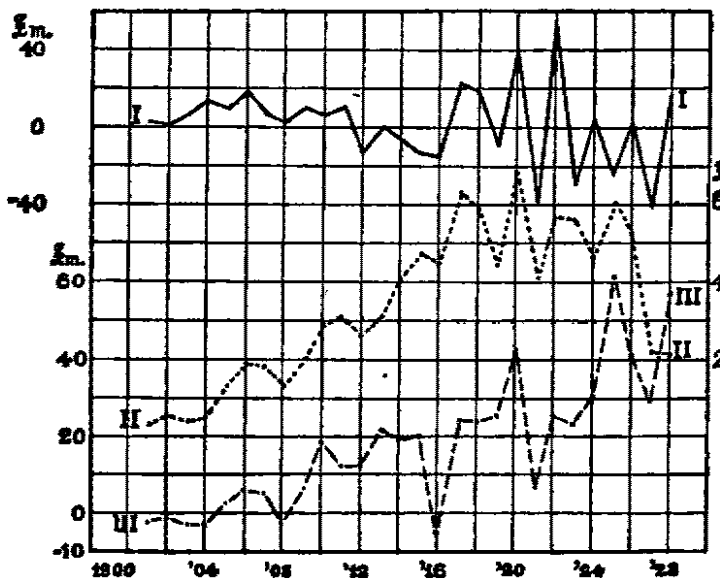
we cannot by examining the statistics find out whether the banking system causes the "natural industrial fluctuations" (resulting from changes in the balance of payments) to be enlarged, or whether it causes them to be reduced, we can find out whether or not it does away with them altogether. For in discussing the effects on the volume of credit that changes in the balance of payments cause automatically, we saw that unless the banks take deliberate steps to offset these effects, there will be positive correlation not only between changes in the balance of payments and changes in the banking funds in London, but also between these two series and the excess of deposits over advances. Hence in order to answer this more limited question, these various series of data must be brought together and compared.¹

The three series are shown in relation to each other in Chart VI. Notwithstanding the inadequacy of the data, the curve of the excess of deposits over advances shows considerable agreement both with the curve of the balance of payments and also with that of the London banking funds. It can therefore be taken that whatever the banks may have tried to do as regards the automatic reactions on the volume of credit (caused by fluctuations in the balance of payments), they have not, in fact, offset these reactions by any means completely. We should therefore

¹ A statement of how the figures were obtained is given in a Note at the end of this chapter.

expect to find that it has not completely prevented what we have called the "natural industrial fluctuations" connected with variations in the

CHART VI



Data : Table V, Col. IX, and Table IV, Cols. I and III.

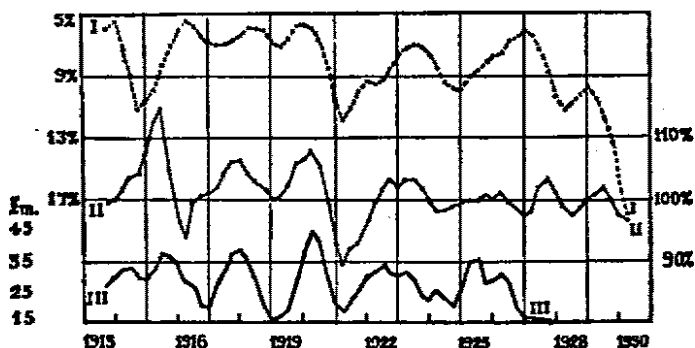
- I. Australian balance of payments.
- II. Excess of bank deposits over advances and investments.
- III. Australian banking funds in London.

balance of payments ; that is, we should expect to find that the fluctuations (around the trend) in the excess of deposits over advances have given rise to fluctuations in the price level, and that these in turn have given rise to fluctuations in

industrial activity—to fluctuations in the percentage of unemployment.

This expectation can be tested. For this purpose it is best to use quarterly figures, which are available since 1913.¹ Owing to the con-

CHART VII



Data : Appendix, Table II, Cols. V and VII, and Table VII, Col. II.

Three-quarterly moving averages of :—

- I. Australian unemployment percentage inverted.
- II. Rate of change in the index of wholesale prices.
- III. Excess of bank deposits over advances and investments.

siderable trend in the price level, the relationship is shown more clearly by taking not the price level itself, but the rate of change—that is, by taking

¹ The quarterly figures of the excess of deposits over advances used here are taken from the Development and Migration Commission's *Report on Unemployment* (1928), p. 52. These figures stop at 1927. The source from which they were drawn is not stated in the Report. They differ slightly from those published in the *Finance Bulletins*, and hence it is not possible to carry the series on to 1930.

the price level of each year as a percentage of that of the preceding year. All three series have been built into three-quarterly moving averages. The unemployment curve is inverted, and is plotted against the price curve with a quarter's lag; so that what happened to unemployment in each quarter is related to what happened to the price level and to the excess of deposits over advances in the preceding quarter. The three curves (Chart VII) show a considerable amount of agreement. It can therefore be concluded that even if the banking system, through its "deliberate" policy, causes the "natural industrial fluctuations" to be in part offset—and, as we have seen, it seems more likely that it causes them to be enlarged—it does not get rid of them altogether.

V. *Alternative Monetary Policies*

The traditional policy secures external equilibrium at the cost of internal disequilibrium. The size of the advantage depends on the importance to Australia of external trade and of foreign confidence in her financial ability; for instability of exchange rates hampers foreign trade, and may be an obstacle to foreign investment in the country. The size of the disadvantage depends on how responsive efficiency-earnings are to changes in conditions of credit, and on how frequent and rapid these changes have to be in order to maintain external equilibrium; for the less responsive efficiency-earnings are, and the more rapid and frequent are the changes in credit, the

wider and more frequent will be the fluctuations in industrial activity. For two reasons the disadvantage is very large for Australia: in the first place, as a result of wages policy, efficiency-earnings are very unresponsive; and in the second place, since exports (which are largely made up of a very few primary products) and public external borrowing are liable to fluctuate widely, the changes in credit required in order to maintain external equilibrium are both frequent and sharp.

It must be remembered that the statistics that we have been examining tell us nothing at all about what the banking system *tries* to do; they do not even tell us what it succeeds in doing; they only tell us what it fails to do. Accepting the conclusion that the banks do not entirely offset the automatic reactions on credit, prices, and unemployment, that, other things being equal, would result from fluctuations in the balance of payments, we have still to ask whether there are any ways by means of which the banking system would be enabled, without causing the community more economic loss than gain, to curtail these industrial fluctuations more than they have done in the past.

There are two courses possible. The first is to maintain the aim of having stable rates of exchange, but to modify the present method of achieving it, in order to give the banking system greater elasticity. The second is to give up altogether the aim of having stable rates of exchange, and instead to aim at having a stable

price level.¹ These two courses are suitable for dealing with different problems. So long as stable rates of exchange were not inconsistent with long-period price stability, the first would be the appropriate measure for preventing short-period fluctuations in the price level; that is, it would be the appropriate measure for dealing with the inadequacy that we have examined of the traditional Australian monetary policy. But if stability of the rates of exchange proved to be inconsistent with long-period stability of the price level, either because the world level of prices was unstable or because, that level being stable, stability of the rates of exchange nevertheless proved to be incompatible with long-period stability of the price level for other reasons,²

¹ Cf. Bellerby, *Minutes of Evidence before the Committee on Finance and Industry* (1931), Vol. I. pp. 169-71.

² It is very likely that it *would* prove to be incompatible. There are two general reasons for this. In the first place, under stable rates of exchange the relative price levels would alter (that is, the English price level being stabilised, the Australian price level would alter) if a change took place in the ratio of interchange between the goods of the two countries. And such a change would take place if there occurred a relative change in any of four things: firstly, the borrowing or lending policies of the two countries; secondly, their tariff policies; thirdly, their productive efficiency; and fourthly, the demand for each other's products. A relative rise in Australia's tariff, and in her foreign borrowing (or increase in England's lending), and a relative decrease in her demand compared with England's, or in her productive efficiency, would cause her price level to rise; and the reverse movements would cause it to fall. But, in the second place, the main difficulty would be that the system of weights in the stabilised English index would be quite in-

measures for increasing the elasticity of the banking system would not be enough. In these circumstances it might be advisable to adopt the second course; but it does not come within our scope to discuss whether it would be advisable. We shall therefore confine ourselves to examining briefly the most important measures available for increasing the elasticity of the banking system without altering the essentials of the traditional policy.

VI. *Short-period devices for increasing the elasticity of the banking system*

There are three principal devices, all of which could be applied at the same time. (a) The first would be to make credit respond to changing conditions earlier, in order that it might not have to respond so much or so violently. This in Professor Copland's view is "the most important

appropriate for the Australian; for because of the very different economic structure of the two countries, the relative importance to them of different commodities in giving rise either to employment or to transactions is very different. The individual wholesale prices of international commodities are always about the same in the two countries. But the prices of a group included in the English index could persistently rise or fall while the index itself remained unaltered; and if this group (say, wool and wheat) happened to be important in the economy of Australia, her price level—that weighted according to her own conditions, not the English—would go on altering, despite the fixed exchanges. A stable world level of prices would probably be as great an abstraction in relation to the price levels of the individual countries as these in turn are to the individual prices comprising them.

single measure that can be taken to control business fluctuations in Australia.”¹ But, as was pointed out above, the essence of the trouble is that the need for change cannot be foreseen very far.

(b) In so far as credit is deliberately made to vary with the size of the banking funds in London and with the proportion of deposits to advances in Australia (that is, other things being equal, with the favourableness of the balance of payments), much could be done to smooth out fluctuations by means of a second device. This is to make the banking funds in London vary according to the need for credit in Australia (in order to keep the price level approximately stable) instead of *vice versa*. There are three ways in which this could be done, all of which could be used together.

(i) The first of these is to increase the size of the London funds of the Australian banks to such an extent that temporary fluctuations in the balance of payments could be ignored. This would simply involve extending a policy that is inevitably used to some extent already. For additional funds accruing abroad can be brought into the country only in the form of imports; and when the rate of exchange is kept stable, the increase in imports will not take place until a change in the volume of bank money has provided the means.

¹ *Control of the Business Cycle with Special Reference to Australia* (Memorandum by Professor D. B. Copland in the Development and Migration Commission's *Report on Unemployment and Business Stability in Australia*, 1928), p. 36.

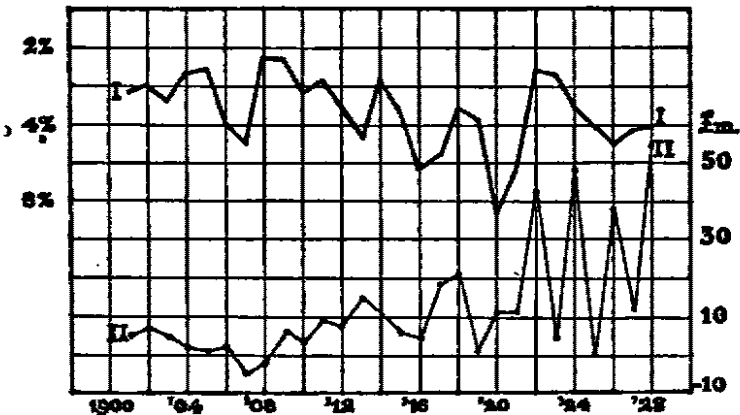
Thus while exports increased in 1924-25, compared with 1923-24, by £42·5 millions, imports increased by only £16·5 millions. In the following year, however, while exports decreased by £13·5 millions, imports decreased by only £5·4 millions. The inference is that, other things being equal, Australian banking funds held abroad increased in 1924-25 and decreased in 1925-26; and this inference is supported by the figures of Australian banking funds in London given in Table IV of the Appendix. The policy suggested would be a method of warding off contractions in credit by (in effect) postponing them till they were no longer required. While it would have the same effect as an increase in the gold reserve, it would not make it harder than it now is to stabilise the world value of gold; and owing to the system of short-lending in London it would be much less costly. But there would be an element of cost, in that the funds would earn less in London than in Australia. And care would have to be taken to begin the scheme when foreign prices were rising; for, other things being equal, the building up of the reserve would involve a contraction in credit and prices at home in relation to those abroad.

(ii) The second way of making Australian banking funds in London vary according to the need for credit in Australia would be for the Australian Governments to offset, through their flotation and repayment of loans, fluctuations occurring in the balance of payments—and hence in the

London banking funds—for other reasons. The fluctuations in credit would thus be avoided. A study of the statistics shows that this dovetailing has not existed in the past. Chart IV (p. 217) shows exports and foreign loans in relation to the balance of payments. It can be seen that the volume of foreign loans, far from varying in such a way as to smooth out fluctuations in the balance of payments, has in the past been largely instrumental in causing those fluctuations that have occurred. But to make foreign borrowing and repayment vary in the way suggested would probably not be easy. Presumably, loans are raised when they are most needed or most easily floated, and are repayable at dates fixed in advance. These dates could not be altered; and if the flotations were to be varied in the way proposed, the average rate of interest paid might be higher. For Australian banking funds in London are especially liable to be scarce precisely when the English investment market is least willing to lend. This is so because Australian export prices are likely to fall, and the balance of payments to become unfavourable, at times when England is suffering from industrial depression. Thus it might be that the desired loans could not be placed. But Chart VIII, which shows annual public borrowing from abroad alongside the annual average rate of discount in London, makes it clear that, at any rate since the war, the London discount rate has had no noticeable influence on the amount borrowed. This suggests that to a considerable

extent fluctuations in the volume of bank money have arisen at home, out of the changing needs of the governments for loans, rather than abroad, out of the changing willingness of the English investment market to lend, and that this dis-

CHART VIII



Data: Appendix, Table VI, and Table V, Col. II.

- I. London market rate of discount inverted.
- II. Australian public borrowing from abroad.

turbing factor is therefore largely within Australia's control.

(iii) The third way of varying the Australian banking funds in London in the manner suggested would be for the governments to continue to borrow as at present, but to transfer the borrowed money to Australia at such times as to make the maintenance of stable rates of exchange con-

sistent with a stable price level. The governments would lose on the amounts left in London the difference between the rate at which they borrowed and that at which they could lend in London at short call. Or if instead they invested the money in securities, they would probably, because industrial depression tends to occur at the same time in Australia as in England, lose on the principal when the time came for them to sell the securities.

Thus, to summarise, there are three ways of giving effect to the second short-period device—that of making the banking funds held in London vary in such wise as to make the price level more stable. These are: to increase the size of those funds, or to dovetail government borrowing from abroad, or the transfer of the borrowed money to Australia, into fluctuations that would otherwise occur in the balance of payments.

(c) The third device for increasing the elasticity of the banking system would consist of a widening of the gold points; that is, there would be a wider margin between the legal buying and selling prices for gold. This would safeguard the Australian banking funds in London without leading to a drain on the gold reserve, and, within those limits, without causing fluctuations in the volume of credit. It would be a method of sacrificing a small part of the advantage of having stable rates of exchange in order to gain greater stability of the price level.

The alternative to these short-period devices

is to go off the gold standard permanently and to adopt a policy of internal price stabilisation. This would be to forego the advantage of the present system in order to get rid of the disadvantage. But if stable exchanges and long-period stability of the price level are reasonably consistent, the short-period devices would be enough, and they should be adopted; for the resulting gain in internal stability would outweigh their costs, and these costs would be less than the disadvantages of having fluctuating rates of exchange that would be involved under the alternative policy of *independent* stabilisation of the price level.

NOTE ON THE STATISTICS USED IN CHART VI

An account must be given of how the figures used in compiling Chart VI were obtained. The most difficult to get were those of the Australian banking funds held in London (that is, the London funds of those Australian banks having offices in London), since, so far as I am aware, no estimate of them has been made before. The estimate given here is necessarily rough. The difficulty is that the banks do not state where their funds are held. About half of them do specify an item, "Cash at London Bankers and Short Call in London," and about half—for the most part the same banks—a second item, "Bills Receivable in London and Remittances in Transit." But it would be a mistake to suppose that these items indicate the size of the London funds of those banks stating them. There are two reasons for this. Firstly,

there is nothing to show whether the "Remittances in Transit" are in transit to England or to Australia; and secondly, short loans in London can always at will be transformed into securities, and *vice versa*; and the information is too scanty to enable securities held in London to be included in the calculation, as they would have to be.

The method adopted was to subtract the excess of assets over deposit liabilities as given in the Australian Banking Quarterly Returns—which refer to Australia alone—*plus* the excess held by the Australian banks in New Zealand, from that as published in the banks' balance sheets—which give the *total* assets and liabilities, whether held in Australia or abroad. The resulting figure is that of the excess of assets over deposit liabilities in London. But in this method there are certain defects. Firstly, foreign banks trading in Australia have been left out of the reckoning. Secondly, while the balance sheet figures refer to a particular date, those of the Quarterly Returns are the average of the quarter. And thirdly, the balance sheets of the different banks are not all published in the same quarter. The second defect is probably not serious, as errors are likely to be in the same direction each year, and the *fluctuations* are thus likely to be shown fairly accurately; and it was possible to make a rough allowance for the third defect for most years, by taking each bank's balance sheet separately, and subtracting from it the figures of that quarter in which the date of the balance sheet occurred. Nevertheless, it is obvious that the figures of London balances are very rough. Moreover, quite apart from these inaccuracies, there is a further reason why the changes in the London banking funds may sometimes not agree with changes in the balance of payments. A few of the Australian banks do considerable business in New Zealand, and the changes in the London balances of these banks will not arise wholly out of Australian transactions, but will arise partly out of

New Zealand transactions, which may fluctuate differently from the Australian.¹

Furthermore, the balance of the international account is itself no more than a rough approximation. This is made inevitable by the fact that the various official publications often give different figures for what purport to be the same items.² Details of the items included in reckoning the balance of payments are given in the Appendix. The main items left out are capital imported privately by business men and immigrants, and interest thereon, the expenditure of foreign tourists in Australia and of Australian tourists abroad, and short loans. The items included, except freight, were calculated from statistics published by the Bureau of Census and Statistics, and by the British Board of Trade.³ The estimate of freight is that given by Dr. G. L. Wood in his *Borrowing and Business in Australia*.

It is important to observe that the figures of the excess of bank deposits over advances³—which are calculated from the figures of deposits and advances published in the *Finance Bulletins* of the Bureau of Census and Statistics—are for the present purpose unsatisfactory; since, as we have already seen, the returns do not distinguish between advances and investments. Thus the effects of changes in the balance of payments on the excess of deposits over advances may be obscured, in the published figures, by associated changes in the proportion of advances to investments. This is a defect that cannot be got rid of.

¹ This was pointed out by Dr. Wilson (*Economic Record*, Nov. 1931, p. 196).

² While this difficulty is common to all the Australian statistics, there is in this particular series the further difficulty that, whereas after 1914 the figures are for the years ending on 30th June, up to that time they are for calendar years.

³ The actual figures, and the details of the sources from which they were drawn, are given in the Appendix.

APPENDIX
STATISTICAL TABLES

TABLE I
POST-WAR WAGE-RATES, WHOLESALE PRICES, AND UNEMPLOYMENT, IN GREAT BRITAIN

Year.	Q'r.	I. Index of Money Wage- Rates.	II. Index of Wholesale Prices.	III. Index of Product Wage- Rates.	IV. Unemploy- ment Per- centage.
1922	4	100.56	94.0	107.0	12.8
1923	1	100.0	95.2	105.0	12.5
	2	100.0	96.4	103.7	11.3
	3	98.31	94.5	104.0	11.7
	4	97.74	97.0	100.1	11.3
1924	1	98.31	100.0	98.3	10.8
	2	100.0	98.8	101.2	9.5
	3	101.13	99.4	101.7	10.3
	4	101.13	102.4	98.7	10.8
1925	1	100.5	101.6	98.9	11.2
	2	101.0	96.0	105.2	11.2
	3	100.5	93.9	107.0	11.8
	4	100.5	92.0	109.2	10.9
1926	1	100.5	88.6	113.4	10.4
	2	100.5	87.2	115.3	12.7
	3	100.0	90.2	110.9	14.0
	4	100.5	90.4	111.2	13.0
1927	1	100.5	85.6	118.0	10.9
	2	101.0	84.8	119.1	9.0
	3	101.0	85.1	118.7	9.3
	4	101.0	84.8	118.5	9.7
1928	1	100.5	84.6	118.2	10.2
	2	100.0	86.1	116.1	10.0
	3	100.0	83.8	119.0	11.5
	4	99.7	83.1	119.7	11.6
1929	1	99.5	83.6	119.0	11.4
	2	99.5	82.2	121.0	9.7
	3	99.3	82.1	121.0	9.8
	4	99.0	80.7	122.7	10.7
1930	1	98.7	76.9	128.3	13.0
	2	98.3	73.4	133.9	14.9
	3	98.25	70.7	139.0	17.1
	4	98.25	67.0	146.6	19.3
1931	1	97.9	64.0	152.9	21.6
	2	97.0	62.8	154.5	21.2

Column I. Dr. Bowley's Index (1924 = 100). *London and Cambridge Economic Service.*

Column II. Index of the Board of Trade (1924 = 100).

Column III. The index of wage-rates in each quarter as a percentage of that of wholesale prices.

Column IV. *Ministry of Labour Gazette*, Aug. 1931, p. 301.

TABLE II

WAGE-RATES, WHOLESALE PRICES, AND UNEMPLOYMENT,
IN AUSTRALIA

Year.	Quarter.	I. Index of Money Wage-Rates. (Adult Males.) (1912 = 1,000).	II. Index of Wholesale Prices. (1911 = 1,000).	III. Index of Product Wage-Rates.	IV. Unemployment Percentage.	V. 3-quarterly moving Average of Unemployment.	VI. Rate of Change in Wholesale Prices.	VII. 3-quarterly moving Average of Rate of Change in Whole- sale Prices.
1913	1		1111		6.4			
	2		1095		7.3	6.9	98.56	
	3		1072		7.0	6.6	97.90	98.82
	4		1072		5.3	6.1	100.0	99.70
1914	1		1085		5.9	5.6	101.21	101.30
	2	1079	1113	96.9	5.7	7.4	102.58	103.42
	3	1084	1185	91.5	10.7	9.1	106.47	104.17
	4	1085	1225	88.6	11.0	11.2	103.46	107.72
1915	1	1085	1387	78.2	12.0	10.8	113.22	112.12
	2	1088	1660	65.5	9.5	10.1	119.68	114.22
	3	1093	1822	60.0	8.8	8.4	109.76	104.73
	4	1102	1544	71.4	6.8	7.2	84.74	97.26
1916	1	1117	1502	74.4	5.9	6.0	97.28	93.81
	2	1130	1493	75.7	5.3	5.5	99.40	99.16
	3	1145	1505	76.1	5.3	5.8	100.80	100.27
	4	1184	1514	78.2	6.7	6.5	100.60	100.66
1917	1	1198	1525	78.6	7.5	6.8	100.59	101.75
	2	1218	1587	76.7	6.3	7.0	104.07	104.24
	3	1234	1715	72.0	7.1	6.9	108.06	105.77
	4	1252	1804	69.4	7.4	6.7	105.19	105.78
1918	1	1255	1877	66.9	5.5	6.4	104.10	104.22
	2	1259	1940	64.9	6.2	5.9	103.36	102.73
	3	1268	1954	64.9	6.1	5.9	100.72	101.55
	4	1296	1965	66.0	5.5	6.0	100.56	99.90
1919	1	1320	1934	68.3	6.5	6.8	98.42	100.17
	2	1338	1956	68.4	8.5	7.1	101.14	101.76
	3	1361	2068	65.8	6.2	6.6	105.73	105.42
	4	1462	2262	64.6	5.2	5.7	109.38	106.35

TABLE II—(continued)

Year.	Quarter.	I. Index of Money Wage-Rates, (A dult males, '1911. = 1000.)	II. Index of Wholesale Prices. (1911 = 1,000.)	III. Index of Product Wage-Rates.	IV. Unemployment Percentage.	V. 3-quarterly moving Average of Unemployment.	VI. Rate of Change in Wholesale Prices.	VII. 3-quarterly moving Average of Rate of Change in Whole- sale Prices.
1920	1	1522	2351	64.7	5.6	5.7	103.93	107.50
	2	1574	2567	61.3	6.2	6.0	109.19	105.45
	3	1660	2650	62.6	6.2	6.7	101.23	100.39
1921	4	1752	2352	74.5	7.8	8.5	88.75	94.66
	1	1807	2164	83.4	11.4	10.6	92.01	89.47
	2	1820	1897	95.9	12.5	11.8	87.66	91.91
1922	3	1833	1822	100.6	11.4	11.1	96.05	92.87
	4	1844	1729	106.6	9.5	10.0	94.90	95.87
	1	1834	1671	109.1	9.2	9.4	96.65	98.62
1923	2	1801	1743	103.3	9.6	9.5	104.31	101.14
	3	1786	1786	100.0	9.6	9.3	102.47	103.10
	4	1785	1831	97.5	8.6	8.5	102.52	102.03
1924	1	1783	1851	96.3	7.2	7.6	101.09	103.09
	2	1785	1956	91.3	7.1	7.2	105.67	103.05
	3	1813	2003	89.0	7.4	7.0	102.40	102.07
1925	4	1840	1966	93.6	6.6	7.1	98.15	99.84
	1	1848	1946	95.0	7.6	7.5	98.98	97.91
	2	1840	1880	97.9	8.3	8.5	96.61	97.96
1926	3	1838	1848	99.5	9.5	9.4	98.30	98.63
	4	1839	1866	98.5	10.3	9.7	100.97	99.44
	1	1840	1848	99.6	9.3	9.9	99.04	99.59
1927	2	1846	1825	101.1	10.2	9.1	98.75	99.68
	3	1869	1848	101.1	7.9	8.7	101.26	100.48
	4	1887	1856	101.7	8.1	8.1	100.43	100.29
1928	1	1892	1841	102.8	8.2	7.7	99.19	100.80
	2	1904	1892	100.6	6.7	7.5	102.77	99.60
	3	1922	1832	104.9	7.6	6.7	96.83	98.63
1929	4	1938	1764	109.9	5.7	6.4	96.29	97.20
	1	1944	1737	111.9	5.9	6.0	98.47	98.37
	2	1942	1743	111.4	6.4	6.3	100.35	102.27
1930	3	1944	1882	103.2	6.7	7.3	107.98	103.17
	4	1955	1904	102.7	8.9	8.8	101.17	101.93
	1	1966	1840	106.8	10.7	10.3	96.64	98.91
1931	2	1963	1820	107.9	11.2	11.1	98.91	97.49
	3	1963	1764	111.3	11.4	10.8	96.92	98.23
	4	1959	1744	112.3	9.9	10.2	98.87	99.44

TABLE II—(continued)

Year.	Quarter.	I. Index of Money Wage-Rates. (Adult-Males.) (1911 = 1,000.)	II. Index of Wholesale Prices. (1911 = 1,000.)	III. Index of Product Wage-Rates.	IV. Unemployment Percentage.	V. 3-quarterly moving Average of Unemployment.	VI. Rate of Change in Wholesale Prices.	VII. 3-quarterly moving Average of Rate of Change in Whole- sale Prices.
1929	1	1958	1788	109.5	9.3	9.7	102.52	100.58
	2	1977	1794	110.2	10.0	10.5	100.34	101.66
	3	1979	1832	108.0	12.1	11.7	102.12	100.22
	4	1974	1799	109.7	13.1	13.3	98.20	97.90
1930	1	1973	1680	117.4	14.6	15.4	93.39	96.94
	2	1956	1667	117.3	18.5	17.9	99.23	96.18
	3		1599		20.5		95.92	

Column I, from *Quarterly Bulletins of Statistics*, and *Australian Year Books*, Nos. 20-23.

Columns II and IV, from *Development and Migration Commission's Report on Unemployment and Business Stability in Australia*, p. 49, and from *Quarterly Bulletins of Statistics*.

Column III is obtained by dividing the index of wage-rates by the index of wholesale prices for each year and multiplying by 100.

Column VI is obtained by dividing the index of wholesale prices for each year by that of the preceding year and multiplying by 100.

Columns V and VII are 3-quarterly moving averages of columns IV and VI respectively.

TABLE III

PRE-WAR WAGE-RATES, WHOLESALE PRICES, AND UNEMPLOYMENT, IN GREAT BRITAIN

Year.	I. Index of Money Wage-Rates. (1850 = 100.)	II. Index of Wage- Rates with trend removed.	III. Index of Whole- sale Prices. (1900 = 100.)	IV. Index of Whole- sale Prices with trend removed.	V. Index of Pro- duct Wage- Rates.	VI. Index of Pro- duct Wage- Rates with trend removed.	VII. Trade Union Unemployment Percentage.
1850	100	160	107	83	93.4	205.4	
1851	100	159	110	86	90.9	202.9	3.9
1852	100	158	108	84	92.6	204.6	6.0
1853	110	167	123	99	89.4	201.4	1.7
1854	114	170	138	114	82.6	194.6	2.9
1855	116	171	133	109	87.2	199.2	5.4
1856	116	170	137	113	84.7	196.7	4.7
1857	112	165	142	118	78.9	190.9	6.0
1858	110	162	127	103	86.6	198.6	11.9
1859	112	163	128	104	87.5	199.5	3.8
1860	114	164	132	108	86.4	198.4	1.9
1861	114	163	131	107	87.0	199.0	5.2
1862	116	164	135	111	85.9	197.9	8.4
1863	117	164	137	113	85.4	197.4	6.0
1864	124	170	140	116	88.6	200.6	2.7
1865	126	171	135	111	93.3	201.8	2.1
1866	132	176	136	112	97.1	202.1	3.3
1867	131	174	133	109	98.5	200.0	7.4
1868	130	172	132	108	98.5	196.5	7.9
1869	130	171	131	107	99.2	193.7	6.7
1870	133	173	128	104	103.9	195.9	3.9
1871	138	177	133	109	103.8	191.3	1.6
1872	146	184	145	121	100.7	184.0	0.9
1873	155	192	147	124	105.4	185.9	1.2
1874	156	192	136	114	114.7	191.7	1.7
1875	154	189	128	107	120.3	193.8	2.4
1876	152	186	127	107	119.7	189.7	3.7
1877	151	184	125	106	120.8	187.3	4.7
1878	148	180	116	98	127.6	190.0	6.8
1879	146	177	111	94	131.5	191.0	11.4
1880	147	177	117	101	125.6	181.0	5.5
1881	147	176	113	98	130.1	182.6	3.5
1882	147	175	112	98	131.3	180.3	2.3
1883	149	176	109	96	136.7	182.2	2.6

TABLE III—(continued)

Year.	I. Index of Money Wage-Rates. (1850 = 100.)	II. Index of Wage- Rates with trend removed.	III. Index of Whole- sale Prices. (1900 = 100.)	IV. Index of Whole- sale Prices with trend removed.	V. Index of Pro- duct Wage- Rates.	VI. Index of Pro- duct Wage- Rates with trend removed.	VII. Trade Union Unemployment Percentage.
1884	150	176	101	89	147.5	189.5	8.1
1885	159	174	96	85	155.2	193.7	9.3
1886	148	172	92	82	160.9	195.9	10.2
1887	149	172	91	82	163.6	195.1	7.6
1888	151	173	93	85	162.3	190.3	4.9
1889	156	177	96	89	162.5	187.0	2.1
1890	163	183	96	90	169.8	190.8	2.1
1891	163	182	96	91	169.8	187.3	3.5
1892	162	180	91	87	178.0	192.0	6.3
1893	162	179	91	88	178.0	188.5	7.5
1894	162	178	84	82	192.8	199.8	6.9
1895	162	177	83	82	195.2	198.7	5.8
1896	163	177	81	81	201.2	201.2	3.3
1897	166	179	83	82	200.0	201.5	3.3
1898	167	179	85	83	196.5	199.5	2.8
1899	172	183	91	88	189.0	193.5	2.0
1900	179	189	100	96	179.0	185.0	2.5
1901	179	188	93	88	192.5	200.0	3.3
1902	176	184	92	86	191.3	200.3	4.0
1903	174	181	92	85	189.6	200.1	4.7
1904	173	179	93	85	186.0	198.0	6.0
1905	174	179	96	87	181.2	194.7	5.0
1906	176	180	103	93	170.9	185.9	3.6
1907	182	185	107	96	170.1	186.6	3.7
1908	181	183	97	85	185.6	203.6	7.8
1909	179	180	99	86	180.9	200.4	7.7
1910	179½	179½	104	90	176.2	193.6	4.7

Column I. Reproduced from Layton, *Introduction to the Study of Prices*, p. 150.

Columns III and IV. Reproduced from Pigou, *Industrial Fluctuations*, pp. 363-64.

Column V. Index of money wage-rates divided by index of wholesale prices and multiplied by 100.

Columns II, IV and VI are the figures respectively of Columns I, III and V, with trend removed. For methods of removing these trends see p. 206, footnote.

Column VII. From Pigou, *ibid.*, pp. 353-54.

TABLE IV
 AUSTRALIAN BANKING STATISTICS, 1901-28
 (For the quarter ending 30th June in each year.)

Year.	I. Excess of De- posits over Advances and Investments.	II. Proportion of Non- interest-bearing Deposits to Total Deposits.	III. London Balances of Australian Banks with London Offices.
	£ m.	%.	£ m.
1901	3.25	40.85	- 2.32
1902	5.71	40.26	- 1.75
1903	3.53	40.39	- 2.97
1904	4.50	38.90	- 2.74
1905	12.98	37.55	2.30
1906	19.29	38.53	5.63
1907	18.46	41.51	5.02
1908	12.85	40.48	- 2.93
1909	20.07	39.75	6.24
1910	29.28	42.52	18.43
1911	30.68	43.38	12.26
1912	26.05	43.66	12.14
1913	30.91	41.39	21.48
1914	40.67	42.84	19.11
1915	46.85	43.08	19.86
1916	44.22	48.11	- 5.16
1917	63.33	50.39	24.20
1918	58.33	49.95	23.97
1919	44.29	47.77	24.90
1920	67.80	50.41	42.22
1921	40.74	45.23	6.56
1922	56.32	49.1	25.39
1923	56.28	46.4	23.08
1924	46.31	48.0	29.99
1925	60.25	46.8	60.78
1926	52.44	45.6	41.20
1927	21.87	43.7	28.82
1928	21.20	40.3	56.81

Column I. Includes the Commonwealth Bank's "Savings Deposits."
 Calculated from the figures of Deposits and of Advances and Investments
 given in the *Australian Finance Bulletins*:—Nos. 11, p. 74; 18, p. 41;
 and 19, p. 38.

Column II. *Finance Bulletins*:—Nos. 11, p. 48; 12, p. 47; and 22, p. 40.

Column III. London balances are the excesses of the assets in London over
 deposit liabilities in London of all Australian banks with London offices.

TABLE V
 AUSTRALIAN BALANCE OF PAYMENTS, 1901-28
Credits.

Year.	I. Recorded Exports.	II. Net Increase in Public External Debt.	III. Bawra Dividends.	IV. Total Credits.
	£ m.	£ m.	£ m.	£ m.
1901	49·70	5·2		54·90
1902	43·92	6·7		50·62
1903	48·25	5·0		53·25
1904	57·49	1·7		59·19
1905	56·84	0·7		57·54
1906	69·74	2·0		71·74
1907	72·82	- 5·3		67·52
1908	64·31	- 2·3		62·01
1909	65·32	6·1		71·42
1910	74·49	2·6		77·09
1911	79·48	8·8		88·28
1912	70·10	6·8		76·90
1913	78·57	14·4		92·97
1914-15	60·59	5·3		65·89
1915-16	74·78	4·3		79·08
1916-17	97·96	18·6		116·56
1917-18	81·43	20·9		102·33
1918-19	113·96	0·5		114·46
1919-20	149·82	10·8		160·62
1920-21	132·16	11·3	7·7	151·16
1921-22	127·85	42·2	9·9	179·95
1922-23	117·87	3·9	5·9	127·67
1923-24	119·49	48·1	5·3	172·89
1924-25	162·03	0·1		162·13
1925-26	148·56	37·5		186·09
1926-27	144·90	11·8		156·70
1927-28	143·21	54·3	3·9	201·41

Column I. Taken from *Statistical Abstracts for the Dominions*, Nos. 52 and 53, and *Australian Year Book*, No. 21.

Column II. Figures for the years 1901-13 taken from Wood, *Borrowing and Business in Australia*, p. 153; those for 1914-28 from *Australian Year Book*, No. 21, p. 1019.

Column III. Taken from *Australian Year Book*, No. 21.

TABLE V—(continued)
 AUSTRALIAN BALANCE OF PAYMENTS, 1901-28
Debits.

Year.	V. Recorded Imports.	VI. Interest on Public External Debt.	VII. Freight.	VIII. Total Debits.	IX. Balance of Pay- ments.
	£ m.	£ m.	£ m.	£ m.	£ m.
1901	42.43	6.43	3.33	52.19	2.71
1902	40.68	6.61	2.99	50.28	0.34
1903	37.81	6.77	2.54	47.12	6.13
1904	37.02	6.80	2.21	46.03	13.16
1905	38.35	6.85	2.56	47.76	9.78
1906	44.74	6.91	3.35	55.00	16.74
1907	51.81	6.69	3.84	62.34	5.18
1908	49.90	6.59	3.71	60.20	1.81
1909	51.17	6.77	3.82	61.76	9.66
1910	60.01	6.85	4.52	71.38	5.71
1911	66.97	6.54	5.16	78.67	9.61
1912	78.16	6.77	6.27	91.20	- 14.30
1913	79.75	7.35	6.73	93.83	- 0.86
1914-15	64.43	9.26 ^a	16.00 ^b	80.43	- 14.54
1915-16	77.74	10.35 ^a	17.20 ^b	94.94	- 15.86
1916-17	76.23	12.05 ^a	18.40 ^b	94.63	21.93
1917-18	62.33	15.25 ^a	22.00 ^b	84.33	18.00
1918-19	102.36	15.60 ^a	22.20 ^b	124.56	- 10.10
1919-20	98.97	17.26 ^a	23.20 ^b	122.17	38.54
1920-21	163.80	18.23	8.84	190.87	- 39.71
1921-22	103.07	20.49	4.74	128.30	51.65
1922-23	131.76	20.79	5.27	157.82	- 30.15
1923-24	140.62	23.20	6.05	169.87	3.02
1924-25	157.14	23.75	5.97	186.86	- 24.73
1925-26	151.64	25.55	6.37	183.56	2.30
1926-27	164.72	26.83	6.92	198.47	- 41.77
1927-28	148.12	31.09	5.78	184.99	16.42

Column V. As for Column I.

Column VI. Taken from Wood, *ibid.*, pp. 153 and 169.

Column VII. Figures for the years 1901-13 and 1921-28 taken from Wood, *ibid.*, pp. 162 and 204; those for 1914-20 from *Australian Year Book*, No. 21, p. 204.

^a These figures are for "Interest and Services."

^b The figures in Column VI are not included in the calculation for these years.

TABLE VI
ANNUAL AVERAGE MARKET RATE OF DISCOUNT (THREE
MONTHS) IN LONDON

Year.	London Market. Rate of Discount.	Year.	London Market. Rate of Discount.
	%.		%.
1901 . .	3.17	1915 . .	3.70
1902 . .	2.97	1916 . .	5.21
1903 . .	3.38	1917 . .	4.81
1904 . .	2.68	1918 . .	3.59
1905 . .	2.62	1919 . .	3.94
1906 . .	3.97	1920 . .	6.40
1907 . .	4.49	1921 . .	5.21
1908 . .	2.29	1922 . .	2.65
1909 . .	2.28	1923 . .	2.70
1910 . .	3.18	1924 . .	3.54
1911 . .	2.92	1925 . .	4.10
1912 . .	3.63	1926 . .	4.51
1913 . .	4.37	1927 . .	4.21
1914 . .	2.88	1928 . .	4.15

The figures for the years 1901-11 are taken from Pigou, *Industrial Fluctuations*, p. 371; those for the years 1912-28 are taken from the *Banking Supplements of the Economist*, May 1918 and May 1929.

TABLE VII

QUARTERLY EXCESS OF AUSTRALIAN BANK DEPOSITS OVER
ADVANCES AND INVESTMENTS

Year.	Q'r.	I. Excess of Deposits over Advances and Investments.	II. 3-quarterly moving Average of Col. I.	Year.	Q'r.	I. Excess of Deposits over Advances and Investments.	II. 3-quarterly moving Average of Col. I.
		£ m.	£ m.			£ m.	£ m.
1913	1	26.7	—	1921	1	19.0	20.6
	2	26.6	26.0		2	26.2	23.7
	3	24.8	26.6		3	26.0	26.3
	4	28.3	29.8		4	26.8	28.9
1914	1	36.4	33.5	1922	1	34.0	32.5
	2	35.8	33.8		2	36.8	34.3
	3	29.1	30.5		3	32.2	32.5
	4	26.7	29.8		4	28.6	31.6
1915	1	33.5	33.5	1923	1	34.0	32.6
	2	40.4	37.5		2	35.3	29.7
	3	38.7	37.4		3	19.7	24.5
	4	33.1	35.0		4	18.4	23.3
1916	1	33.1	30.9	1924	1	31.9	26.4
	2	26.6	27.4		2	28.8	23.6
	3	22.6	22.9		3	10.2	21.1
	4	19.5	22.1		4	24.2	25.8
1917	1	24.2	26.9	1925	1	43.1	35.2
	2	37.1	33.6		2	38.2	36.2
	3	39.6	37.8		3	27.4	30.1
	4	36.6	38.6		4	24.7	30.5
1918	1	39.6	36.0	1926	1	39.4	32.0
	2	31.9	30.4		2	31.9	30.1
	3	19.7	21.3		3	19.1	21.3
	4	12.3	16.3		4	13.0	17.6
1919	1	16.9	16.0	1927	1	20.7	17.3
	2	18.7	20.1		2	18.1	16.4
	3	24.7	27.3		3	10.5	14.9
	4	38.6	38.0		4	16.0	—
1920	1	50.6	44.8				
	2	45.1	42.9				
	3	33.0	31.5				
	4	16.5	22.8				

Calculated from the figures given in the Development and Migration Commission's Report on Unemployment and Business Stability in Australia (1928), p. 52.

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