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THE RELATION OF HOME INVESTMENT TO UNEMPLOYMENT

I

THE case for " public works " has often been discussed, and there is a final plea that the advocate almost invariably appends to his argument. It is important, we are told, not to overlook the beneficial repercussions that will result from the expenditure of the newly-employed men's wages. But little is done to evaluate these repercussions in concrete terms. The main purpose, though not the only purpose, of this article is to outline the means by which this gap could be filled, and incidentally to suggest that the case for " public works " may be stronger than is always recognised.

The argument will apply to the effects of any net increase in the rate of home investment. The increased employment that is required in connection actually with the increased investment will be described as the " primary " employment. It includes the " direct " employment, and also, of course, the " indirect " employment that is set up in the production and transport of the raw materials required for making the new investment. To meet the increased expenditure of wages and profits that is associated with the primary employment, the production of consumption-goods is increased. Here again wages and profits are increased, and the effect will be passed on, though with diminished intensity. And so on *ad infinitum*. The total employment that is set up in this way in the production of consumption-goods will be termed the " secondary " employment. The ratio of secondary to primary employment is a measure of these " beneficial repercussions " that are so often referred to.

It will simplify the process of exposition if *expenditure by the Government on roads* is taken as a convenient instance of an increase in home investment. But this simplification must not be taken to imply either that there is anything in the argument that confines its application to investment taking place directly under the auspices of the Government, or that the building of more *roads* is a particularly desirable form of investment.

II

It is necessary, in the first place, to clear out of the way the objection that any reduction of unemployment that is effected by Government action will be at the expense of an equal increase of unemployment in some other quarter. If the Government were to raise the funds required to pay for the roads by means of taxation, it is obvious that unfavourable reactions would be probable. Of these the most important would be the "secondary unemployment" that would result if increased taxation were to reduce the taxpayers' expenditure on consumption-goods. The amount of this "secondary unemployment" would depend on the extent to which increased taxes are paid at the expense of consumption rather than of saving. But that is a matter for separate study; and throughout this article it will be supposed that the necessary funds are raised by means of borrowing.

It is sometimes claimed that if the Government borrows money for the purpose of building roads, this necessitates an equal reduction in the funds available for investment from other sources.[1] But it is clear that even if this claim has any force at all, it cannot have a universal application. For it is always within the power of the banking system to advance to the Government the cost of the roads without in any way affecting the flow of investment along the normal channels. If it assists the processes of thought, it may be imagined that the Government obtains its funds in this kind of way. But it will become clear in the sequel that no such hypothesis is really necessary. For it will be demonstrated later on [2] that, *pari passu* with the building of roads, funds are released from various sources at precisely the rate that is required to pay the cost of the roads.

It is, however, important to realise that the intelligent co-operation of the banking system is being taken for granted. It is supposed that the object of the Central Bank is to achieve the maximum of employment that is consistent with remaining on the gold standard. If the increased circulation of notes and

[1] How important is the influence that has been exerted upon British policy by this claim is forcibly demonstrated by the following information supplied in 1927 by the British Government to the International Labour Office: "While it is not possible to give any specific indications that competition arose with other enterprises owing to the raising by the State of moneys for the various State-assisted employment projects, the decision taken by the Government at the end of 1925 to restrict grants for relief schemes was based mainly on the view that, the supply of capital in the country being limited, it was undesirable to divert any appreciable proportion of this supply from normal trade channels." (*Unemployment and Public Works*, published by The International Labour Office, 1931, p. 30.)

[2] See p. 189.

the increased demand for working capital that may result from increased employment are made the occasion for a restriction of credit, then any attempt to increase employment—whether it is by way of road-building or by any other means, or, indeed, by awaiting the return of world prosperity—may be rendered nugatory.

III

It will be assumed throughout the greater part of this article that money-wages are not raised as a consequence of the reduction in unemployment or of any rise in prices with which the reduction in unemployment may be associated. Even if this assumption is not entirely reasonable, it is clear that it is essential if the analysis is to proceed at all. (But it *is* suggested, though with some hesitation, that over a limited, and not so very limited, range the assumption is not appreciably wide of reality.) To take into account the effects of a possible rise in wages would necessitate, not only an estimate of the amount of the rise, but, far more serious, an analysis of the effect of a rise in wages on the level of employment; and such an investigation must be ruled outside the scope of this article.

An attempt will, however, be made [1] to demonstrate that there is *some* increase in employment even though real-wages are maintained at their former level—or, in other words, if money-wages are raised so as to compensate for the rise in prices. But to the extent, on the other hand, that it is to the reduction in unemployment rather than to the rise in prices that wages respond, there is clearly no method whatever of increasing the volume of employment.

IV

Finally, no account will be taken, in assessing the effects on employment, of any increase in productive efficiency that may result from the Government's expenditure. That, perhaps, is why roads are a good illustration to adopt as an object of such expenditure.

For this reason, too, the argument of this article could, with suitable modifications, be applied to a discussion of the desirability of reducing the Sinking Fund or of the undesirability of reducing the dole.

V

Considerable use will be made in these pages of the expression "saving on the dole." It must be clearly understood that these

[1] In a subsequent number of the ECONOMIC JOURNAL.

words are not intended to imply any moral judgment on the system of unemployment insurance. The word " dole " is used, purely as a matter of convenience, to cover the whole of the expenditure of an unemployed man on consumption, whether it is derived from the Unemployment Insurance Fund, from local authorities, from charity, from borrowing, from his friends and relations or from his own accumulated savings.

For the purpose of developing the argument it will be assumed that when a man obtains work, the " saving on the dole " that results does not have the effect of increasing the consumption of other members of the community. Above all, this assumption presupposes that any change that occurs in the expenditure of the Unemployment Insurance Fund falls entirely on the rate at which the fund is increasing or diminishing its debt and on the amount of the budgetary Sinking Fund. Manifestly this assumption is a somewhat unreal one. Even if contributions to the Fund are not affected, a reduction in the cost of transitional benefit will almost certainly lead to some reduction of national taxation, and a reduction of the rate at which the Fund is getting into debt will lead to some scaling down of the Chancellor of the Exchequer's standards of respectability in regard to Sinking Funds—and so again to a reduction of taxation.

But, in relation to the amount of the saving on the dole, any reduction of taxation that occurs is likely to be small—this will be obvious if consideration is paid to the present level of the real Sinking Fund—and the consequent increase in expenditure on consumption will be still smaller. In so far, however, as it occurs, it adds an *a fortiori* force to the argument of the following pages. The secondary employment is increased if road-building results in less taxation and consequently in greater expenditure by taxpayers on consumption-goods.[1]

VI

I turn now to the often debated question of the effect of Government investment on the general level of prices. This question has been debated from various points of view. It has

[1] If this increase in expenditure were exactly equal to the saving on the dole, and if it were divided between home- and foreign-produced goods in the same proportions as the dole is divided, then the same consequences would ensue as would ensue on my assumption—that there is no such increase in expenditure—if the dole were zero, *i.e.* if the unemployed lived on air. If a greater amount were spent on home-produced goods than would have been spent on home-produced goods if the money had been spent by the unemployed, then the results can be gauged by supposing, on the basis of my assumption, that the dole is negative.

been debated with an eye on the expansion of bank credit that may accompany the building of roads. Somewhat more adapted, perhaps, to the end in view have been the discussions that have centred on the various alleviations that partially set off the increase in purchasing power caused by increased investment. Of these the most important are the saving on the dole and the increased imports of consumption-goods and of raw materials that take place when employment is increased.

But it is, I think, quite clear that a very important, though nevertheless extremely obvious, consideration is usually omitted in these discussions. It is, perhaps, its very obviousness that accounts for its being so persistently overlooked. For the line of approach that will now be taken up is the one that would be followed under the impulse of crude common-sense—there is no room here for analytical subtleties. No claims of originality are advanced for adopting it, but that does not mean that it is not very important.

The price-level and output of home-produced consumption-goods, just like the price and output of any single commodity, are determined by the conditions of supply and demand. If the conditions of supply can be regarded as fixed, both the price-level and the output are determined by the demand; and there is a unique correlation between price-level and output. For a given output of consumption-goods there corresponds a certain price-level of consumption-goods; and this is their price-level quite independently of the causes that are responsible for maintaining the given output. If there is a certain increase in employment on the production of consumption-goods, the change in their price-level is the same whether the increased employment is fostered by large advances from the Central Bank to the Government or whether it is the symptom of the return of prosperity by a more natural route. If this is to be true, it is only necessary that the change shall be actuated by a change in the conditions of demand and not by a change in the conditions of supply. Then the volume of employment engaged in producing consumption-goods and the price-level of home-produced consumption-goods are uniquely correlated. For a given increase in the output of consumption-goods the change in their price-level depends only on the supply curve of consumption-goods in general, the curve being drawn from the point of view of the particular period of time that is under consideration—long, short, or otherwise. If the supply curve rises steeply, there is a large rise in prices; if conditions of constant supply price prevail, there is no

rise in prices; and if the supply curve were falling, there would be a fall in prices.

VII

The relief of unemployment by means of national development is often objected to on the grounds that it will cause a rise in the cost of living. The extraordinary fatuity of this objection is, of course, quite apparent. There is nothing unnatural about the rise in prices caused by the building of roads. It will occur equally if employment in the production of consumption-goods is stimulated to an equal extent by more natural means (other than a reduction of costs). Indeed, if it is an improvement in world economic conditions that is the cause of increased employment, the cost of living will rise by considerably *more* than if the cause is the building of roads. And this for two reasons. In the first place, not only the whole of the secondary employment but also part of the primary employment will in this case be engaged in producing consumption-goods. For part of the primary employment will be engaged in the production of commodities that are to be exported or that were previously imported, and some of these commodities will be identical with commodities that enter into consumption at home. It follows that, for a given volume of primary and secondary employment, the output of home-produced consumption-goods is greater, and therefore the cost of living is higher, if the cause of the change is an improvement in the conditions of world demand than if it is the building of such things as roads, whose production can be carried on without appreciably affecting the condition of supply of consumption-goods. But it is the second reason that is likely to be more important quantitatively. An increase in employment that is part of a general revival in world trade will be accompanied by a rise in the prices of imported consumption-goods (including the supremely important category of food) and of imported raw materials, while the rise in prices that is caused by a purely local policy of road-building will be almost entirely confined to that part of the national consumption that is produced at home. The effect on the cost of living is, therefore, far more serious in the former case than in the latter case.

Even more fantastic is it to argue at the same time that road-building causes a rise in prices and yet that it is not responsible for any *net* addition to the volume of employment. The rise in prices, if it occurs at all, is a natural concomitant of increased output, to a degree indicated by the slope of the supply curve.

It is impossible to maintain at the same time that prices will rise and that there will be no increase in output. If the result, owing to the operation of some mysterious cause, of the construction of roads by the Government is an equal reduction of investment in other channels, there is no secondary employment and no rise in prices. But if it is a fall in the output of *consumption*-goods that compensates for the employment provided on the roads (as might *conceivably* be the case if the Government raises the necessary funds by taxation rather than by borrowing), then the effect of road-building is to cause a *fall* in prices (on the assumption that production takes place under conditions of increasing supply price).

VIII

It should now be clear why it is hopeless to discuss the possibility of a rise in prices in terms merely of the saving on the dole and the increase in imports that result from increased employment. These indeed are two factors, as we shall see later, that determine the amount of the secondary employment. But before it is possible to deduce the magnitude of the change in prices, it is necessary to introduce the slope of the supply curve. Nor is it as simple as that. For the amount of secondary employment itself depends, as will be shown later, on the extent of the rise in prices by which it is accompanied. The two are uniquely correlated, but the amount of secondary employment is effect as well as cause. The amount of secondary employment must be such that, together with the primary employment, it gives rise to just so much alleviation to the original investment (in the shape of saving on the dole, increased imports, and so on) as will account for the rise in prices that is appropriate to that amount of secondary employment. If the supply of commodities in general is perfectly elastic, there can be no rise in prices and the secondary employment must be such as to make it so. If the supply of commodities in general is perfectly inelastic, there can be no secondary employment and the rise in prices must be so great that the net secondary employment is zero.

In general it can be said that, for a given supply curve, the secondary employment is smaller the greater are the saving on the dole, the increase in imports, and the other alleviations that accompany a unit increase in employment. It follows that it is perfectly true to state that the greater the extent of these alleviations, the smaller is the rise in prices that results from a given amount of road-building. But from such a view-point the problem

is liable to assume a peculiarly distorted aspect. It is not merely that there would be a failure to recognise the predominant importance of the supply curve—the fact, for instance, that if supply is perfectly elastic, there *can* be no rise in prices. It might also appear that the claims of road-building as a national policy are stronger if the alleviations (saving on the dole, increase in imports, etc.) are great than if the alleviations are small, because it is when the alleviations are great that the rise in prices is small. But in fact it may just be if the alleviations are great that road-building is least justifiable, for it is then that the *secondary employment* is small—and the "beneficial repercussions" are weak. It is possible to imagine a case—it is very far removed from reality—where unemployed men who are set to work on making roads devote the whole of the net increase in their incomes to goods that have to be imported. There would then be no rise in prices—the alleviations are equivalent to the whole of the original investment. But road-making would be a far weaker economic proposition than it is in fact, for there would be no secondary employment.

IX

Perhaps it is not altogether inappropriate to pause at this point to consider the appearance of our line of approach in the light of Mr. Keynes' new equations. The building of roads represents an increase in investment. But before it is possible to assess the net effect on the difference between savings and investment, it is necessary to bring into the account those alleviations which have already been several times referred to. Payment of the dole represents negative saving, and the saving on the dole represents, therefore, an addition to total savings. An increase of imports, whether of consumption-goods or of raw materials, represents a diminution of the foreign balance and therefore of total investment. If entrepreneurs continue to spend the same amount of money on consumption-goods as before although output has increased, their savings, in Mr. Keynes' sense, have increased. On the other hand, to the extent that non-wage-earners (and wage-earners who were previously in employment) increase their expenditure on consumption-goods irrespective of any increase in total output—whether as a result of the fact that they have more to spend, because of increased profits, or of the fact that prices of consumption-goods have gone up—savings diminish: this is an *aggravation*. The new value of the difference between savings and investment, appropriate to

Mr. Keynes' equations, can only be deduced by subtracting the alleviations corresponding to the total new employment from the cost of the roads, and adding the aggravation.

If the supply of consumption-goods is perfectly inelastic, there is no secondary employment and the problem is considerably simplified. It is only necessary now to consider the alleviations associated with a *known* volume of primary employment—and to subtract the aggravation. Prices rise by an amount corresponding to the difference between the cost of the roads and the amount of these alleviations. If the aggravation can be neglected, the rise in the price-level of home-produced consumption-goods is equal to the increase in expenditure directed towards them by the roadmakers divided by their volume. This is the case when all productive resources available for the production of consumption-goods are already being utilised and, over a certain range of output and over a sufficiently short period of time, it is not possible to increase their output appreciably and there is no incentive for an appreciable reduction of output.

But simplest of all is the case where it is not the supply of consumption-goods that is completely inelastic but *total* employment that is fixed, so that if investment increases, the production of consumption-goods must diminish by an equal amount. Then there is no alleviation, since there is no change in employment, and if in addition the aggravation is negligible, the rise in the price-level of consumption-goods is simply equal to the cost of the new investment divided by their volume. This is the case to which Mr. Keynes' equations apply in their full simplicity. It occurs when the whole of the factors of production are employed, and continue to be employed, in producing either for consumption or for investment.

At the other end of the scale is the case, very much closer to the actual conditions that prevail to-day, where the supply of consumption-goods is perfectly elastic. The price-level of consumption-goods is then constant, and, however great may be the cost of the investment that is taking place in road-building, the secondary employment will be such that the total alleviation (*minus* the aggravation) keeps the difference between total savings and total investment at a constant amount (or, more accurately, at an amount that varies in direct proportion with the output of consumption-goods).

But this conclusion—that under certain circumstances employment can be increased without any significant alteration in the difference between savings and investment—does not in the

slightest degree invalidate the causal force of Mr. Keynes' argument. The motive force that increases employment is an increase in investment or a reduction in savings. As a concomitant of this increase in employment occur other changes in savings and investment which, partially or wholly, neutralise the effect on the difference between savings and investment of the change that is the cause of the increased employment.

X

It should now be clear that the whole question ultimately turns on the nature of the supply curve of consumption-goods. At normal times, when productive resources are fully employed, the supply of consumption-goods in the short period is highly inelastic. The building of roads carries with it little secondary employment and causes a large rise in prices. But at times of intense depression, when nearly all industries have at their disposal a large surplus of unused plant and labour, the supply curve is likely to be very elastic. The amount of secondary employment is then large and the rise in prices is small.

If there is in existence a large stock of surplus resources that are not very inferior to the worst of those that are actually being employed,[1] the elasticity of supply is likely to be very large indeed up to the level of output at which this surplus would be becoming inappreciable. Provided that output is not carried above this level, an expansion of employment bears with it only a very small rise of prices. The greater the depth of the depression, the greater is the expansion of employment that is associated with a given rise in prices. And the greater the expansion of employment that has already been secured by a policy of road-building, the greater is the rise in prices that accompanies a given further expansion of employment; for the short-period supply curve is concave upwards. It is clear, then, that if there is ever any justification for expenditure on " public works " as a means of reducing unemployment, the justification is greatest when depression is most severe; and the scale on which it is desirable that such a policy should be carried on is also then most extensive.

XI

I turn now to a calculation of the ratio of secondary to primary employment, and I begin by assuming that the supply of con-

[1] As is, *par excellence*, the case when the " short-time " method of working plant is in operation over a wide field.

sumption-goods is perfectly elastic over the range that is in question. (The adoption at this point of such a sweeping assumption is to be regarded purely as a means of simplifying the treatment—it would be quite possible, on lines that will be indicated later, to begin with a perfectly general case.) An attempt will be made below [1] to assess the extent to which the results require modification in the light of the conditions that prevail in this country at the moment, and it will be suggested that the modification is not very large.

Let each man who is placed in employment receive a wage W, and let the increase in profits that is associated with the employment of each additional man be P. Let the value of the increase in imports of raw materials and unfinished goods that accompanies the employment of each additional man be R. For the sake of simplicity it will be assumed that W and P are the same for both primary and secondary employment.

Let the employment of each additional man involve a *net increase* in the rate of expenditure on home-produced consumption-goods of mW out of his wages and of nP out of the addition to profits with which his employment is associated. Then the total increase in the rate of expenditure on home-produced consumption-goods is

$$m\mathrm{W} + n\mathrm{P}.$$

The direct result is a further addition to the volume of employment [2] of amount

$$\frac{m\mathrm{W} + n\mathrm{P}}{\mathrm{W} + \mathrm{P} + \mathrm{R}} \text{ men}$$

$$= m\frac{\mathrm{W}}{\mathrm{W} + \mathrm{P} + \mathrm{R}} + n\frac{\mathrm{P}}{\mathrm{W} + \mathrm{P} + \mathrm{R}} = k \text{ (say) men.} \quad (1)$$

It follows that for each man placed in primary employment, the number who receive secondary employment is

$$k + k^2 + k^3 + \ldots$$

$$= \frac{k}{1 - k}.$$

And the ratio of secondary employment to primary employment is

$$\frac{k}{1 - k} \quad \ldots\ldots\ldots \quad (2)$$

[1] See p. 186.

[2] I am here considering the position in the final position of equilibrium when everything has settled down. But some time will, of course, elapse between the point when the primary employment begins and the point when the secondary employment reaches its full dimensions, because wages and profits are not spent quite as soon as they are earned. I do not enter into the question of this time-lag.

Let the expenditure of an unemployed man (the " dole ") be U, and let a proportion m' of the increase that takes place in his income when he becomes employed be devoted to home-produced consumption-goods.

Then $$m'(W - U) = mW;$$

or $$m = m'\left(1 - \frac{U}{W}\right) \quad . \quad . \quad . \quad . \quad (3)$$

It can be seen that, for every man put to work on the roads, the volume of secondary employment is great to the extent that the dole forms only a small proportion of a full wage, to the extent that a man who becomes employed devotes a large proportion of the increase in his income to home-produced goods, to the extent that a large proportion of any addition to profits that accompanies increased output is spent on home-produced consumption-goods, and to the extent that increased production necessitates the import of only a small proportion of raw materials. The more a country approximates to a closed system and the smaller the dole in relation to a full wage, the greater is the ratio of secondary to primary employment. Now the United States constitute a better approximation to a closed system than do most countries and the ratio of the income of an unemployed American to that of an employed American is notoriously small. It may be expected, therefore, that the ratio of secondary to primary employment is a good deal larger in the United States than in most other countries.[1] A perfectly closed system, to go one step further, is the world as a whole. It follows, as is indeed quite obvious, that an international policy of " public works " would be far more efficacious from the point of view of each separate country than a purely local policy. Finally, as a limiting case, it may be instructive to contemplate a closed system in which there is no dole,[2] and in which any increase in profits that accompanies an increase of output is either negligible in amount or devoted entirely to consumption. One man put to work on the roads would then place all the remainder of the unemployed into secondary employment.[3]

[1] The argument, can, of course, be reversed to deal with the secondary unemployment that accompanies primary unemployment due to a *decrease* in the rate of investment. A slump in the rate of investment spread evenly all over the world would fall more heavily in those regions, like the United States, where the dole is relatively low than in those regions, like this country, where the dole is relatively high.

[2] Or in which any saving on the dole results in an equal increase of expenditure on consumption on the part of taxpayers, etc. (see p. 176).

[3] For a general statement of this possibility, to cover the case when supply is not perfectly elastic, see p. 189 below.

It is a matter of considerable difficulty to make exact, or even at all approximate, estimates of the various quantities contained in the above equations. But it is hoped that, until more precise investigation can be undertaken, the following figures [1] will help to convey some idea of the orders of magnitude that are concerned for the case of this country at the present time.

I shall assume in the first place that the cost of imported raw materials and unfinished goods entering into the *addition* to output that is associated with increased employment constitutes $\frac{1}{10}$ of the *retail* price of the extra product. In other words, $\frac{R}{W+P+R}$ is supposed to be $\frac{1}{10}$. I shall then assume that $\frac{W}{W+P+R}$ (the ratio of marginal wages cost to the price of the product) is $\frac{7}{10}$ and that $\frac{P}{W+P+R}$ is $\frac{1}{5}$.

It also seems reasonable to suppose that when a man becomes employed, $\frac{1}{6}$ of the *increase* in his income is devoted to imported *finished* goods (excluding the costs of transport and distribution, payment for which is to be regarded as expenditure on *home*-produced goods). In other words, I put m' equal to $\frac{5}{6}$.

The estimate of the ratio of the " dole " to a full wage involves some consideration of the type of man who will be drawn into employment by a policy of the kind that is under consideration. It seems probable that a moderate addition to the ranks of the employed would be recruited mainly from the younger of the unemployed, whose families are of less than the average size. It may perhaps be concluded that $\frac{U}{W}$ is rather *less* than $\frac{1}{2}$.

There remains only the quantity n, but here assessment is largely a matter of guess-work. The best that I can do is to suggest that it would be extremely unreasonable to suppose that as small a proportion as $\frac{1}{3}$ of any increase that took place in the rate of business men's earnings [2] would be devoted to home-produced consumption-goods.

The following table is intended to indicate how the value of the ratio of secondary to primary employment, given in

[1] They are based, for the most part, on statistical material that has been placed at my disposal by Mr. Colin G. Clark, to whom I should like to express my great gratitude. But the responsibility for the statistical conclusions that I have attempted to derive from this material rests entirely with me.

[2] The part played by the earnings of small shopkeepers, poor shareholders, etc. is not to be overlooked.

the last column, depends on the values that are adopted for $\frac{U}{W}$ and n.

$$\frac{W}{W+P+R} = \frac{7}{10},\ \frac{P}{W+P+R} = \frac{1}{5},\ m' = \frac{5}{6}.$$

$\frac{U}{W}$	n	$m = m'\left(1 - \frac{U}{W}\right)$	k (by equation (1))	$\frac{k}{1-k}$
$\frac{3}{7}$	$\frac{3}{4}$	$\frac{10}{21}$	$\frac{29}{60}$	$\frac{29}{31} = \cdot 94$
$\frac{3}{7}$	$\frac{2}{3}$	$\frac{10}{21}$	$\frac{7}{15}$	$\frac{7}{8} = \cdot 88$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{12}$	$\frac{47}{120}$	$\frac{47}{73} = \cdot 64$
$\frac{1}{2}$	$\frac{1}{3}$	$\frac{5}{12}$	$\frac{43}{120}$	$\frac{43}{77} = \cdot 56$

The first row of figures is possibly on the liberal side, as supplying an estimate of the ratio of secondary to primary employment, but it seems very much more certain that the last row is on the conservative side. If we were to suppose that in actual fact the ratio is $\frac{3}{4}$, we might, it may perhaps be suggested, be erring in the direction of under-statement.

XII

The next step is to make an allowance for the fact that supply is not perfectly elastic. Under the conditions that prevail at the moment it seems reasonable to suppose that the short-period elasticity of supply is not less than 4, *i.e.* that a 4 per cent. increase in the domestic output of consumption-goods would be accompanied by a rise in prices to the *ultimate consumer* of less than 1 per cent. It is now necessary to make an estimate of the elasticity of demand for these goods. If people's expenditure on consumption-goods does not alter when their price-level is raised, the elasticity of demand for them is unity. But actually it seems probable that people would spend rather more on consumption, and save less, if prices were to rise. To the extent that they would do so, the elasticity of demand is less than unity. On the other hand, many classes of consumption-goods meet with foreign competition, either abroad, in the case of exports, or in the domestic market itself, and for them the demand may easily be elastic rather than inelastic.[1] Setting one consideration against the other and assessing each so far as it is possible to do so, I suggest that the demand for home-produced consumption-goods

[1] But the tendency of foreign competition to increase the aggregate elasticity of demand for our goods is offset to some small extent by the rise that takes place in the foreigners' demand curve as a result of the expansion in our imports.

is likely to be inelastic rather than elastic, provided that small changes are under consideration. Let us suppose that the elasticity is unity. A 1 per cent. rise in prices would then, taken by itself, be responsible for a 1 per cent. contraction of consumption, and consequently of output. But we are supposing that a 1 per cent. rise in prices would be accompanied by an increase in output of at least 4 per cent. It would appear then that when the output of consumption-goods expands by 4 per cent., the extra expansion that *would* have taken place if there had been no rise in prices would have been less than 1 per cent.—and the total expansion would then have been less than 5 per cent. It may be concluded, on the basis of the assumptions that have been made, that the fact that supply is not perfectly elastic necessitates a reduction of the estimate of secondary employment of the last section by less than $\frac{1}{5}$. Such a small alteration is, of course, negligible.

But even this conclusion is unduly conservative.[1] It completely overlooks the fact that a rise in prices is the cause of an increase in profits and that part of these increased profits is likely to be spent on home-produced consumption-goods. It can easily be seen that if the whole of the increase in profits that is the direct result of higher prices were spent on home-produced consumption-goods, then, on the basis of an elasticity of demand of unity, output would be precisely the same as though there were no rise in prices at all. And if the demand for consumption-goods has an elasticity less than unity, then the same assumption leads to the conclusion that the rise in prices actually causes the output to be greater than it would be if there were no rise in prices. The less elastic the supply, the *greater* would be the secondary employment! This last result is mentioned here mainly as a *curiosum*—it is unlikely in practice that a sufficient proportion of the increase in profits that results from a higher level of prices would be devoted to home-produced consumption-goods—but the theoretical possibility of its occurring is worth emphasising.

XIII

Let us return for a moment to the case, worked out in section XI, in which supply is supposed to be perfectly elastic. If N

[1] This section, and a considerable portion of the rest of the article, is largely the result of the co-operation that I have received from Mr. J. E. Meade of Hertford College, Oxford. I must content myself with a general acknowledgment, but it will, I hope, be clear that my treatment is fundamentally based on work of Mr. Meade's that is as yet unpublished.

men are placed in primary employment, the total increase in employment is, by equation (2),

$$N\left(1 + \frac{k}{1-k}\right) = \frac{N}{1-k}.$$

For each man placed in employment the saving on the dole is U, the increase in imports of raw materials and unfinished goods is R in value, the increased imports of finished goods that result from the newly-employed man's expenditure are $(1 - m')(W - U)$ in value, and the sum of the increase in unspent profits and of the increase in imports of finished goods to which the newly-accruing profits are devoted is $(1 - n)P$. The total sum of these items is

$$\begin{aligned} &U + R + (1 - m')(W - U) + (1 - n)P \\ &= W + P + R - (mW + nP), \text{ by equation (3)} \\ &= (W + P + R)(1 - k), \text{ by equation (1).} \end{aligned}$$

But we have seen that if N men are placed in primary employment, the total increase in employment is $\frac{N}{1-k}$. It follows that the sum of these items is $N(W + P + R)$, which is precisely the value of the product of the primary employment, *i.e.* the cost to the State of the roads.

We have then the following relation :—

> Cost of investment = saving on dole + increase in imports + increase in unspent profits.

The last head comprises that part of the increase in profits that is devoted neither to home-produced consumption-goods nor to imported goods.

Now this relation, far from being the logical consequence of summing an infinite geometrical progression, is in reality self-evident in nature and is merely a particular case of a general relation, due to Mr. J. E. Meade, that covers the case when supply is not perfectly elastic, so that prices rise when employment increases. This general relation is a derivative form of Mr. Keynes' formula for profits.[1] In its most general form Mr. Meade's relation runs as follows :—

> Cost of investment = saving on dole + increase in excess of imports over exports + increase in unspent profits — diminution in rate of saving due to rise in prices.

[1] It is to be noted that the word profits is here being employed in the ordinary sense of the difference between business men's receipts and their outgoings, and not in the sense in which Mr Keynes employs the word. But it is clear that Mr. Meade's relation is merely a special statement of Mr. Keynes' general proposition that " profits " are equal to the difference between investment and savings.

In this equation the second term on the right-hand side includes both the effect of increased employment in causing an increase in the volume of imports of consumption-goods and of raw materials and the effect of higher prices in causing an increase of imports and a reduction of exports. The third term comprises the unspent portion (*i.e.* spent neither on home-produced consumption-goods nor on imported goods) of the profits that emerge as a result both of greater output and of higher prices. And the fourth term allows for the increase in people's expenditure that may result when prices go up.

The relation can be deduced in an *a priori* kind of way by considering that money paid out by the Government to the builders of roads continues to be passed on from hand to hand until it reaches one of the *culs-de-sac* indicated by the various terms on the right-hand side of the equation. By utilising it as a basis, it should be possible to deduce a formula for the ratio of secondary to primary employment that is applicable whatever may be the elasticity of supply of consumption-goods.

This relation should bring immediate relief and consolation to those who are worried about the monetary sources that are available to meet the cost of the roads. The increase in the excess of imports over exports is equal, if gold is not flowing at an appreciable rate, to the reduction in foreign lending. So that if one is looking for sources *outside* the banking system, they are available to precisely the right extent. The cost of the roads is equal to the saving on the dole *plus* the reduction in foreign lending *plus* the increase in unspent profits *minus* the reduction in the rate of saving.[1]

In a closed system, such as the world as a whole, the second term of Mr. Meade's relation is *ex hypothesi* zero. If, in such a closed system, there were no dole (*i.e.* the unemployed lived on air) and the newly-accruing profits were devoted in their entirety to consumption,[2] the ratio of secondary to primary

[1] There are some who maintain that if a tariff causes an increase of foreign lending, lending at home must necessarily be contracted in an equal degree. Without entering at all into the question of the general validity of their point of view, it would appear possible to defeat them *on their own ground* by using an argument precisely analogous to the argument of the text. For if a tariff is successful in causing an increase in foreign investment, funds will be released, and will—if one likes to think of it in that kind of way—be available for foreign lending, to an extent exactly equal to the increase in foreign investment—just as the building of roads (home investment) releases funds exactly equal to their cost.

[2] Or, more accurately, if the newly-accruing profits remained unspent at a rate equal to or less than the rate at which savings are diminished as a result of the rise in prices.

employment would be infinite. No matter how small the elasticity of supply of consumption-goods, "one man put to work on the roads would then place all the remainder of the unemployed into secondary employment." Such a system would, of course, be unstable. A small decrease in the rate of investment would result in everybody becoming unemployed.[1]

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I turn now to the question of the quantitative importance of the saving on the dole. Mr. Meade's relation tells us that it falls short of the total cost of the roads by an amount equal to the increase in the excess of imports over exports *plus* the increase in unspent profits *minus* the diminution in the rate of saving that may be brought about by the rise in prices. In a closed system there can be no change in exports or imports, and if only the increase in unspent profits were less than the diminution in the

[1] It may, finally, be of interest to notice how Mr. Meade's methods can be applied to deal with the controversy that is at present raging as to the effect on a country's exports of a reduction in its imports. If there is no change in the rate of home investment, either in this country or in the rest of the world, the effect of a tariff on this country's imports can be represented as follows. (For the sake of simplicity the effect of an alteration in prices on the rate of saving is omitted. It can easily be brought in if its presence is desired.) For this country:

Decrease in excess of imports over exports = saving on dole + increase in unspent profits.

For the rest of the world (considered as a single country):

Decrease in excess of exports over imports = loss on dole + diminution in unspent profits.

If it were supposed that in the rest of the world there is no "dole" (*i.e.* the unemployed live on air) and that business men reduce their expenditure on consumption to the full amount of any reduction in their profits, then it would be quite true that our tariff would cause such a large reduction in the foreigner's volume of output and employment that his purchases from us would fall by an amount precisely equal to the reduction of our imports. Exports then *would* pay for imports, even under those short-period conditions that underlie the argument. But this conclusion depends essentially on assumptions of an extraordinary degree of absurdity; and an examination of the actual conditions that prevail would, it may be supposed, lead to a result of an entirely different order of magnitude. Moreover, if we *are* to make absurd assumptions, it is hard to see why this country should not be allowed to participate. Let us therefore suppose that, in this country also, there is no dole and that business men devote to consumption the whole of any increase in their profits. Then it would follow from the above equation that the imposition of a tariff would cause such a large increase in the volume of our output and employment that (leaving on one side, as irrelevant to the present argument, the effect on our exports of a *rise in their price*, as opposed to that of a fall in the foreigner's demand curve) our imports would not contract at all in the aggregate. We might import less manufactured goods, but we should import more food and raw materials. Exports would pay for imports—yes, but a tariff would cause no net reduction in our imports.

rate of saving, the saving on the dole would more than cover the cost of the roads. Now the world is a closed system. It follows that an international policy of digging holes and filling them up again would result in a net gain to the united treasuries of the world, provided only that business men could be persuaded to be sufficiently spendthrift with the additions to their profits which such a policy would secure for them. Such a hope is almost certainly a vain one. But no account has been taken of the increase in the yield of taxation that would accompany an expansion of output and of employment. If the treasuries of the world were to gain as increased revenue an amount equal to the excess of the increase in unspent profits over the diminution in savings, the promotion, on an international scale, of perfectly useless "public works" would still be profitable, even from a narrow budgetary point of view. We are probably still a little way off reality—but can it be so very far?

To consider international action of this kind is perhaps a little premature. More interesting is the question of the cost that this country would be involved in if it were to act alone. Part of the benefit without any of the cost would then accrue to other countries. To the internationally minded this should not be an objection—indeed this is one of the main respects in which the stimulation of home investment is superior to the stimulation of foreign investment. Moreover, the adoption of a policy of this kind by this country would, by the force of example, induce other countries to adopt similar policies, in whose benefits we should then take a share. But I am content to consider the case where this country acts alone and where the benefits received by the rest of the world are left out of account. It follows from Mr. Meade's relation that under conditions in which in a closed system the building of roads would *just* be a sound proposition (from the narrow budgetary point of view), the national debt, if a single country acts alone, will be raised by the value of the increase in imports (and reduction in exports) which the building of roads will bring about.

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But let us consider the saving on the dole in the case of this country in concrete terms. Let it be supposed that expenditure on road-building and other forms of home investment increases by £50 million per annum. The primary employment can then be supposed to amount to 250,000 and, on the basis of a ratio of $\frac{3}{4}$, the secondary employment will be 187,500—to make quite

certain let us call it 150,000,[1] so that the total employment will be 400,000. If the dole amounts on the average only to 25*s.* a week, the saving to the Unemployment Insurance Fund will be £25 million per annum, which is just half the total cost. This £25 million the Exchequer can then afford to contribute out of its own resources—that is to say, out of the Sinking Fund in so far as the saving on the dole diminishes the rate at which the Insurance Fund is getting into debt, and out of the ordinary budget to the extent that the saving is in respect to the cost of transitional benefit.

We still have to allow for the increase in the yield of taxation. For each man who is put into employment the money-income of the community increases by considerably more than £120 per annum (say in the form of profits £30 *plus* such increase in the value of output as a whole that takes place as the result of the rise in prices, and £90 as the difference between the wage and the dole). It seems reasonable to suppose that of this amount at least £15 will be paid to the Exchequer in the form of taxation. It follows that if employment is increased by 400,000, the revenue will expand by £6 million—and clearly this is an extremely conservative estimate.

At any rate it would appear safe to conclude that the Exchequer would actually reap a net gain if it were to subsidise capital investment to the extent of *one-half* the capital sum involved. A necessary condition is, of course, that the work would not be undertaken if no subsidy were forthcoming. This condition severely restricts the field over which subsidies to investment are applicable. But even if the Treasury were to confine itself to railway companies and local authorities, it might reasonably be expected that the payment of subsidies of one-half of the capital cost would induce a very substantial increase in the rate of investment.

Let us now take the case where the whole cost is borne by the State. Let us suppose that the Government, national and local, spends the £50 million per annum for three years, at the end of which time conditions may be imagined to have improved. Then if a saving of only one-half is allowed for, the addition to the national debt (including the debt of local authorities) will be £75 million, which, at an average rate of interest of $3\frac{1}{2}$ per cent., amounts to an annual charge in perpetuity of a little over £$2\frac{1}{2}$ million, or about $\frac{1}{15}$ per cent. of the present national income and

[1] This is what the secondary employment would be if the ratio of secondary to primary employment were only $\frac{3}{8}$.

¼ per cent. of the revenue raised by taxation. For this, 400,000 men are put into employment for three years and £150 million, equal in money-value to about ¾ per cent. of the national capital, are spent on capital works. To suppose that the consequent increase in efficiency could lead to an automatic expansion in the yield of taxation equal to the whole of this interest charge of £2½ million would be quite unjustifiable—particularly when account is taken of the reduction in foreign investment that is associated with this increase in home investment—but the increase of efficiency should certainly be taken into account if one wants to consider how a policy of public works at the present time would affect the budgetary problems of the future.

I turn now from the budgetary to the national standpoint. At first sight the natural line of approach might appear to be to regard the increase of £2½ million in the interest payable on the national debt as a burden on posterity and to measure against it the increase in their national income that would result from £150 million having been spent in the past on schemes of a greater or less degree of permanent utility and from 400,000 men having been given work to do for three years instead of having lived in idleness. If this view were correct, it would be sufficient to show that the national income of posterity would be increased by at least £2½ million as a result of this expenditure of £150 million, and then the policy would be fully justified without taking into account any of the benefits that it would confer on the present generation.

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But this view is, of course, fallacious. The payment of interest on the internal debt is not a burden in the real sense of the term—it is a case of transfer expenditure. It is only if the policy results in a reduction of posterity's income that it can be said to inflict a real burden. The only respect in which such a burden can be inflicted is as a result of the reduction in foreign investment that results from the policy. The expenditure of £50 million per annum for three years might reduce our annual balance of trade by, say, £20 million per annum, resulting in a total diminution of our foreign investment of £60 million. The loss of interest from abroad on this £60 million represents, taken by itself, a real burden on posterity. But against it has to be set the benefits that will be permanently derived by increasing the national equipment at a cost of £150 million and by rescuing 400,000 men for three years from the

deteriorating influences of involuntary idleness. It can scarcely be doubted that posterity would inherit an asset rather than a liability as a result of such a policy as we are considering.

But even if there *were* a net real burden on posterity, it would still remain to set against its discounted value the benefit that would be derived by the present generation. Here the problem is a simple one, at any rate so long as the community is regarded as a single entity. The aggregate consumption of the community is necessarily increased as a result of a policy of "road-building," for both the production and the importing of consumption-goods are stimulated. This increase in consumption is a measure of the benefit received by the present generation.

And so long as the building of roads does not involve any diversion of resources away from the production of consumption-goods, it will continue to add to the rate of aggregate consumption of the community. Provided then that it does not result in an actual decrease in the rate of accumulation of capital, material and immaterial, *i.e.* provided that the benefit conferred at home is greater than the loss in respect to foreign investment, as it almost certainly would be—there would appear to be no limit to the period of time during which it would be desirable to continue this policy of public works, except the very important one imposed by the condition that the factors of production employed in building the roads would, if the roads were not being built, remain unemployed.

But this conclusion reaches too far. The progressive increase in the rate of taxation that is necessitated when the national debt increases faster than the national income only fails to involve any real burden on the community as a whole if its "announcement" aspects can be neglected. As the rate of taxation becomes higher and higher, the "announcement" effects become more and more serious—and it is on these lines that one would have to assess the undesirability of progressively increasing the national debt or of permanently retarding its liquidation.

So far we have considered the community as a whole. It remains to say a word about the effect of road-building, while the roads are being built, on the real incomes of the various constituent classes of the community. There are two classes whose real incomes are certainly increased—the newly employed and the business class—and, to the extent that prices rise, there are two classes whose real incomes are diminished—those who were already *fully* employed and the *rentier* class. It has already been said that the real income of the community as a whole is

increased. But of more interest is the effect on the real income of wage-earners as a whole, taking employed and unemployed together.

This involves the question of the rise in prices that would accompany an increase in employment. Under the conditions that rule at present it seems certain that if 400,000 were put into employment, primary and secondary, the real value of the aggregate income (wages *plus* dole) of the wage-earning class would increase. But under conditions in which the supply of consumption-goods were considerably less elastic than it is likely to be to-day it is quite possible that an increase of employment, brought about in this kind of way, would entail a reduction of the real value of wage-earners' aggregate income. But even then it would not necessarily follow that it would be contrary to the interests of wage-earners as a class for a policy of national investment to be adopted. It is too often forgotten that the main purpose of schemes of this kind is to *reduce unemployment*, and that unemployment does not fail to be an evil when its persistence involves a higher real income to the wage-earning class than would otherwise be obtainable. If this were not so, it might often be in the interests of wage-earners to advocate steps that would still further increase unemployment. But unemployment is an evil in itself, it is an evil on account of the *maldistribution* of the wage-earners' aggregate income that it usually causes, and it is an evil, together with the depression of the industrial system with which it is generally associated, on account of its effect in retarding the rate of economic progress.

XVII

It is necessary, finally, to turn to the effect on the foreign exchanges of an increase in the rate of home investment. Increased employment means increased imports of raw materials and finished goods and, to the extent that prices rise, there is a further increase of imports and a decrease of exports.

The result is that the net amount lent abroad by this country has to be reduced. It has been suggested above that the employment of 400,000 men might mean a reduction in the balance available for foreign lending of £20 million per annum. Unless other factors are brought into operation, this reduction in lending has to be effected by a rise in the various rates of interest. If other things remain equal, there ensues some decrease in the home investment that flows along normal channels, and this partially offsets the increase in investment that takes the form

of road-building. It is important to assess the magnitude of this counteracting effect. Two factors are involved :—(*a*) the sensitivity of foreign lending to the rate of interest, and (*b*) the sensitivity of home investment to the rate of interest. It seems reasonable to suppose that, provided that the change that is under consideration is a fairly small one, the sensitivity of foreign lending to a rise in the rate of interest is considerably larger than the sensitivity of home investment. Moreover, under the conditions that prevail in this country at the present time, an increase in home investment, in the form of road-building, provided it is not undertaken on too large a scale, will result in a considerably smaller diminution in the amount available for lending abroad. It may therefore be concluded that it is not necessary to make any substantial deduction in respect to the effect of the rise in the rate of interest.

But if an attempt is made to increase home investment by a very considerable amount, the reduction in foreign lending is likely to be relatively greater—because a less elastic portion of the supply curve for consumption-goods will now come into operation and because the demand for goods that meet with foreign competition is likely to become more elastic as their price is raised.[1] It also seems likely that the sensitivity of home investment to a rise in the rate of interest becomes greater as the extent of the rise in the rate of interest is increased. It may, therefore, be concluded that the case of an extremely bold policy of road-building might necessitate more serious consideration of the effects of the rise in the rate of interest on home investment. But even then it must not be forgotten that the whole point of a policy of public works is that it enables an increase in the rate of home investment to take place without that *fall* in the rate of interest that would be necessary if we were relying on private enterprise. The fact that it necessitates some rise in the rate of interest is not in itself a valid objection.

But there are available, of course, methods for curtailing, partially or completely, the necessity for this rise in the rate of interest. In the first place, there are the various devices that could be employed with the object of restricting the freedom of foreign lending. Secondly, there is the possibility of combining

[1] On the other hand, the ratio of secondary to primary employment is likely to be less and, therefore, the ratio of the increase in employment (to which a portion of the increase in imports is directly proportional) to the cost of the roads is likely to be less. It follows that the reduction in foreign lending *may* be relatively less when many roads are being built than when only a few roads are being built.

a vigorous policy of home development with the imposition of a tariff. By combining the two measures in suitable proportions, it would be possible to maintain the value of imports at its present level. In this way each would be freed of one of the main objections that can be raised against it. The strain inflicted by road-building on the foreign exchanges would very largely disappear and the tariff would fail to impoverish our customers.

So far it has been supposed that a policy of national investment has no influence on the schedules of people's desire and ability to carry on investment at home and to lend abroad. This is a manifestly unwarranted supposition, but two opposing forces have to be reckoned with, and it is not at all clear where the issue lies.

An increase of output, and of the margin of profit that goes with it, cannot, taken by themselves, fail both to increase the attractiveness and to facilitate the process of investment at home. It is quite obvious that this effect is of great quantitative importance. If there were no opposing forces in operation, it might easily happen that, in spite of the rise in the rate of interest, the ordinary processes of home investment would be promoted rather than retarded by a policy of public works.

This supposes that the state of general confidence is not affected. There is strong justification for concluding on *a priori* grounds that the inauguration of an active economic policy would promote confidence rather than upset it. But this is not a valid reason for disbelieving the warning, so frequently put forward at the present time, that an extensive policy of public works would promote a feeling of distrust. For the state of confidence is a function of what people are thinking, even though their thinking may be completely irrational, and therefore only those who are in touch with the minds of the people are competent to pass judgment on this question.

A lowering of confidence may operate in two ways. It may, in the first place, reduce people's willingness or ability to carry on real investment at home. But also of great importance is its effect in increasing people's desire to hold their money abroad rather than at home. To the extent of the increased pressure to lend abroad, to which the phrase "flight from the pound" is often employed to give exaggerated prominence, the rise in the rate of interest that is necessary to protect the exchanges becomes greater, and its depressing influence on the rate of home investment also becomes greater.

But it is very difficult to believe that the dangers are as great

as is often suggested. There can be no doubt that close contact with men of affairs must lead further towards a realisation of these dangers than can *a priori* reasoning. The only question is whether it may not lead too far. When a practical man declares that a policy of national development would result in a "flight from the pound," his judgment is really valuable only if he means that he himself would fly from the pound—and if he really would undertake the flight when the occasion arose. But too often the economic theory held by the business man bears little relation to his own practices—it is only if the practices of himself and of others like him were different from what they are that their theories could be correct. When a business man's theory involves a hypothesis about men's behaviour to which his own individual conduct fails to conform, he cannot be regarded as a very much sounder judge than the theoretical economist.

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