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(You may like to see this -
it is an early draft, which has not yet
been revised. I am sorry to say it is not
final.)*

NATIONAL INCOME AND EXPENDITURE AFTER THE WAR

1. This paper is an attempt to project the figures of the Budget White Paper into the post-war period, with the object of ascertaining in round figures the resources likely to be available for various alternative and competitive purposes. The figures given are based on what seem prima facie to be plausible assumptions, but they should be regarded as illustrative rather than prophetic. They have been set forth in an Appendix somewhat elaborately and in such a form that different assumptions can be easily substituted and the result calculated.

2. The upshot is that "standard" post-war national income at factor cost with White Paper definitions can be taken (see Appendix § 12) at £m6500 (± 200), increasing thereafter by £m100 annually, on the assumptions stated, of which the most important are the following:-

(1) 1,000,000 men in H.M. Forces. Each 250,000 above or below this figure would make a difference of about £20,000,000, this figure being the result of the conventional method adopted to measure the contribution to the national income of men in the Forces.

(2) 800,000 men unemployed (or a somewhat larger aggregate of men and women together, 10 women reckoning as the equivalent of 7 men for the purpose of this calculation). Each 250,000 above or below this figure would make a difference of about £100,000,000.

(3) Wage-cost at a level 30 per cent above 1938 in round figures. (Current wage-cost is 28.4 per cent above 1938). Each 2.5 per cent movement in wage-cost above or below this figure would make a difference of about £145,000,000.

(4) The margin of \pm £m200 around £m6,500 is provided to allow for different assumptions as to the loss of skill of labour on account of the war and the gain in technical efficiency, compared with 1938, when the war is over. No separate allowance has been made to cover the loss of ultimate product resulting from a deterioration in the terms of foreign trade, this being regarded as one element in the factors on which depends the technical efficiency of the national productive resources.

3. The method adopted for the computation of the national income assumes that all factor costs, other than house-rents, have increased to the same extent as the assumed increase in wage-cost (i.e. 30 per cent). Gains in productive efficiency are assumed for the purpose of statistical comparison, to show themselves in an increased return to the factors of production, over and above the increase of 30 per cent in their cost, though, if they occur, they may in fact show themselves partly in lower prices and only partly in higher returns.

If market prices in fact exceed this index because they also reflect an excess profit due to scarcity, the national income measured in terms of money is increased by the amount of such excess profit. There is, however, a further reason of quite a different kind why the index number of market prices, including foreign as well as domestic produce, may differ from the index of wage-cost. For if the price of imports has risen relatively to the price of exports, this is reflected in market prices, but obviously not in calculations relating to the amount of domestic output.

4. Does our figure of £m6,500 (+ 200) look reasonable on general grounds?

At a level of factor costs 30 per cent higher than in 1938, the national income of 1938 would have been about £m6,000; and the national income of 1941 about £m6,700. But the latter figure was somewhat reduced by the method adopted for computing the output of men in the Forces, namely as being measured by their pay and allowances in cash and kind, which works out at less than the net output per wage earner in industry. If they had been employed in industry, in addition to those already so employed, the value of the national income in 1941 would have been nearly £m7,000. Thus our post-war estimate assumes a substantial falling off from war-time productivity.

5. The most difficult and problematic of our assumptions relates to the measure of industrial efficiency after the war compared with 1938. As pointed out in the Appendix, a fairly large proportion of the labour forces is employed during the war on the same or similar work to that on which they will be employed after the war. The progress of electrification, the improvements in the internal combustion engine, the greater familiarity with mass-production methods acquired by many manufacturers, the introduction of a wide range of American-designed machine tools, the standardisation of product and the cutting out of redundant and unnecessary variations of type, the concentration of industry, the elimination of middlemen and many unnecessary costs of distribution, the pruning of "extras" which do not add to the value of product proportionately to their expense, the dilution of fully skilled men, the acceleration of training, the revolution in agriculture, - surely much or most of all this will remain as a permanent gain. Moreover the loss of skill on the part of men absent in the Forces must have been partly offset by the great numbers trained in industry for the first time and the benefit to individuals by "up-grading" and the advantage of experience on high grade jobs which they might have waited for years to get or might never have had in peace-time conditions.

It can, therefore, be argued that, so far from industrial efficiency having stood still during the war years, we shall find ourselves with at least the usual secular improvement in hand as soon as the special war-time difficulties of black-out and of transport and of the shortage of certain materials and of excessive strain and overtime are removed. If so, the calculation in § 12 of the Appendix would justify the higher limit of £m6,700 for £m6,500 as our standard estimate of post-war national income; and we might adhere to this figure even after allowing for deterioration in the terms of foreign trade. The lower limit of £m6,300 assumes a very modest gain from the above war-time changes after allowing for a possible deterioration of labour skill.

We shall find in the sequel that if, after a short interval of transition, the state of industrial efficiency allows us to take £m6,700 in place of £m6,500 as our standard estimate (reckoned at a price level 30 per cent above 1938), this will make all the difference between comfort and discomfort in the early post-war years.

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6. In the first two years after the war it would be prudent to assume a larger army, heavier interim unemployment, and temporarily reduced efficiency as compared with our "standard" estimate of £m6,500. On the other hand, it is inevitable - particularly if the above factors are operating - that we should have a heavy adverse balance of trade during these two years, i.e. a continuance for the time being of overseas disinvestment.

It seems not unlikely that these two factors may be of the same order of magnitude, thus roughly offsetting one another and leaving disposable resources at a fairly constant figure around £m6,500. For example, in the first year national income might be as low as £m6,150 and the adverse balance £m350; in the second year national income £m6,300 and the adverse balance £m200; in the third year national income £m6,450 and the adverse balance £m50; in the fourth year national income £m6,550 and the favourable balance £m50; - thus leaving the domestically disposable resources at around £m6,500 throughout this period; i.e. about 8 per cent in volume above the domestically disposable resources in 1938, although we should not be earning this increment from our own resources until the fourth year after the war.

7. It is to be doubted if we can get much closer to the prospects than this. As we have seen in § 5 above more optimistic, but far from extravagant, assumptions as to efficiency, would allow us another 3 per cent improvement. It would need very pessimistic - and, surely, highly unplausible - assumptions to bring us out significantly worse off in disposable resources than in 1938. Such a result could only come about in practice through an absolute inability to import either in exchange for exports or on credit and its equivalent. An absolute inability to import necessary food and raw material would constitute a breakdown in our national economy of which this survey does not attempt to take account.

8. Can we forecast how this aggregate might be divided between (a) personal consumption (b) government expenditure on goods and services and (c) domestic investment?

Let us begin with government expenditure (central and local) on goods and services. Pre-war expenditure corrected for higher costs and a larger army (we need not assume that additional munitions will be required - at least for a time!) might be put at £m1,300. Let us raise this to £m1,400 to allow a margin for unavoidable new services (other than new transfer payment services). After
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deducting expenditure by local authorities and adding (say) £m650 for transfer payments, this would correspond to an ordinary budget of about £m1,750. But, obviously, government expenditure would not fall to this figure until demobilisation had proceeded far enough to reduce the size of the Forces to our "standard" assumption. The discharge by the Government of all arrears of payments in respect of war contracts, which do not involve any current expenditure on goods and services, are, on the other hand, in the nature of transfer payments. Altogether, perhaps we might take ordinary government expenditure on goods and services (including local authorities) at £m1,800 in the first complete post-war year, £m1,600 in the second and £m1,400 thereafter. (These figures are exclusive of the budgetary cost of transfer payments.)

9. For what level of personal consumption must we provide as indispensable?

In 1941 consumption, adjusted for indirect taxes on consumption, was £m3,863 at the prices then ruling; which for reasons explained above, were somewhat above the level of wage-cost in this year. Adjusting to a uniform price level 30 per cent above 1938, consumption may have been about £m3,900 in 1941, and about £m4,650 in 1938.

Let us begin by assuming a consumption of £m4,000 in the first post-war year (which would probably mean a significant improvement on 1942 consumption which is likely to be appreciably below 1941.) How much is left over for net investment?

To begin with, a small adjustment has to be made. National income as calculated excludes all indirect taxes. Expenditure, whether personal, government or investment, is not easily adjusted for indirect taxes on production, as distinct from consumption, amounting to about £m200. The above estimates of expenditure include indirect taxes on production. Thus in order to reckon how much is left for investment, the cost of which will also be inclusive of indirect taxes on production, we have to start by adding on £m200 to our estimated £m6,500 of disposable resources, in order to reach a total which includes indirect taxes on production.

Thus, on the basis of £m4,000 personal consumption and a government expenditure of £m1,800 on goods and services, we are left with £m900 for investment. If in the second and third years we allow the reduction of government expenditure first of all to £m1,600 and then to £m1,400 to be

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balanced by an increase of personal consumption first of all to £m4,200 and then to £m4,400, we have a steady figure of £m900 available for investment in each of the first three post-war years.

10. This represents a high, but not impossible, standard of austerity; for even in the third year after the war period consumption would be 5 per cent below 1938. How high a level of saving does it imply? To ascertain total saving, we have to deduct from £m900 the amount of overseas disinvestment, leaving £m550 in the first year, £m700 in the second year and £m850 in the third year. To ascertain personal gross saving we have to deduct government and business saving and add on death duties.

In view of the pressure of deferred personal expenditure and the natural reaction from war-time restrictions, it seems unlikely that total saving would reach these figures in the early post-war period except with the assistance of a level of taxation sufficiently high to allow substantial government saving and a somewhat strict direct control of consumption through rationing etc.

If, however, we were content with a balance of £m600, instead of £m900, available for net investment in each year, thus reducing the demand on total saving by £m300, this result might be attainable with less strain; for we should have reached the pre-war level of consumption by the third year, and have got nearly half-way back to pre-war consumption in the first year.

Also if post-war industrial efficiency proves high enough to allow the substitution of £m6,700 for £m6,500 as our standard, that would permit £m800 as the rate of annual investment and also a satisfactory relaxation of restrictions on personal consumption. There might also be a further economy in the amount expended by government on goods and services below the assumed estimate. And unemployment might turn out to be less than 800,000, which is a pessimistic assumption.

11. The chief demands on the pool of resources available for net investment are, in the early period, the following:-

- (a) Re-stocking
- (b) Working capital
- (c) Costs of change-over to peace-time production including the liquidation of war contracts
- (d) Deferred repairs and maintenance
- (e) War damage to buildings
- (f) Re-building the mercantile marine
- (g) Strictly new investment

/Towards

Towards (a) and (b) we have the liquidation of government-owned stocks and other proceeds of the War Disposals Board. The other items can be met either at a slower or a faster pace. At a first glance it would appear that £m600 a year (equivalent to £m460 at pre-war prices) available for net investment would do no more than provide at a minimum pace for the items other than strictly new investment. But £m800 to 900 should be a fairly comfortable allowance. It should be remembered that these figures are calculated on the basis of a price increase of 30 per cent over 1938, and would be correspondingly higher if a higher level of prices in fact prevails. (It is apparent what an important difference £m200 - 300 of national output, more or less, will make in mitigating or aggravating the difficulties of the post-war situation, when we come to the final analysis.)

It would be useful if the appropriate departments would make estimates of their capital requirements under each of the above headings in each of the first three post-war years.

12. It would seem likely that, in the first two or three post-war years, demand for goods and services on the part of the government, private consumers and investment, might be sufficient to absorb disposable resources of as much as £m7,250 if they were available and in the absence of any controls. This compares with £m6,500, increased by £m200 if we take the more optimistic assumptions, as the measure of the disposable resources likely to be available.

If this is correct, the necessity of controls both on consumption and on investment is evident. On the other hand, the restricted standards of consumption and investment which should be physically possible are not intolerable; and the higher limit of £m6,700, if attainable as the national output, should prove very tolerable indeed.

13. If it is permitted to draw morals from the above, the two following emerge clearly -

(a) The continuance of controls is indispensable since the existence of potential excess demand is indisputable and outside the limits of possible error.

(b) But the curtailment (or slackened pace) of investment should be left to be decided by actual physical impediments and not by an attempt to lay down beforehand a programme reduced to the procrustean bed of a

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predetermined figure such as £m600 or any other amount; for the range of uncertainty is too great to allow prior determination. No harm in having ready a programme considerably larger than we can carry out.

The amount available for investment is, within wide limits, necessarily and properly a residue and is subject to the wide range of error inevitable in estimating residues. The above suggests a range of £m600 to £m900 as reasonably probable; this is very wide, yet it would not be safe to assume that the true figure will certainly lie within it. Since inflation and not deflation is clearly the danger in the early post-war years, there is perhaps, some risk of our becoming too precautions about it. There should be only those limitations on production (as distinct from consumption) which are made physically inevitable by the shortage of materials or suitable labour.

The continuance of controls should clearly include the raw material controls in particular. These are the lynch-pin of the whole system, since rationing and price stabilisation and priority allocation all depend on them. But raw material control must not become a means, or a pretext, for hoarding raw materials. Consumers of raw materials must be prevented from hoarding them. But available raw materials should not be withheld from actual use unless for exceptional reasons. The maintenance of security stocks must not become a habit or stand in the way of use, particularly in the early years. When we again reach the era of surpluses, the time for re-building them will return.

J.M.K.

28.5.42.

Statistical Appendix

1. The method adopted is to express the income from current production as a function of employment, labour productivity, factor prices etc., and then to make certain additions to this amount for items, such as the net income of dwelling houses, which do not depend on these variables. To avoid confusion in the main analysis it will be convenient to dispose of these special items first.

2. There are three items which it is convenient to exclude in this way and they will be denoted as follows -

A = net income from dwelling houses etc.

B = net income from foreign investments

C = income in cash and kind of H.M. Forces and Auxiliary Services.

It is evident that none of these items form part of the current net output of labour. C, which might at first sight seem an exception, cannot conveniently be so treated since the net output of the forces is treated as being equal to their income. They are therefore in a very different position from workers in industry for whom income represents about one-half of net output.

These three items have been estimated as follows -

£ millions

	1938	1940	1941	1944
A	265	265	265	265
B	200	175	150	100
C	85	450	710	210
Total	550	890	1,125	575

The value of A is the same as the figure implicit in the White Paper. B for 1938 has been taken from the Board of Trade's estimate and for later years has been roughly estimated. C is the cash pay, allowances and income in kind of H.M. Forces and Auxiliary Services. The average income in this sense of all officers and other ranks of H.M. Forces in 1941 was £208. The estimate of C for 1944 assumes therefore that H.M. Forces are approximately one million in number.

We shall now estimate the remaining and more important part of the national income. The first factor to be considered is employment.

3. An estimate of employment involves the following steps

- (a) An estimate of the number of gainfully occupied male and female wage earners. It will be convenient here to treat shop assistants as wage earners although in the White Paper they were treated as salary earners. From this figure an allowance must be made for unemployment.
- (b) An allowance for the difference in the average productivity of men and women.
- (c) An allowance for changes in hours of work.
- (d) An allowance for the fall in the average productivity of wage earners due to bringing into industry of progressively less efficient workers.

In short, writing

N_m = number of male wage earners (including shop assistants)
in work

N_w = number of female wage earners (including shop assistants)
in work

s = the ratio of the productivity of the average female wage earner to the average male wage earner

h = the proportionate addition to the labour force over 1938
resulting from the increase in hours worked

z = the proportionate reduction in the labour force due to the fall in
average productivity resulting from bringing less efficient
labour into industry.

then employment is equal to

$$(N_m + sN_w) (1 + h) (1 - z)$$

Each of these variables must now be considered separately.

4. A rough estimate of the order of magnitude of the ratio of men's to women's productivity (s) may be made as follows. It may first be assumed that the ratio is not greater than unity nor less than 0.5 which is the ratio of earnings. Indeed, it is likely that the ratio is greater than 0.5 owing to the preference of employers for the employment of men and to the monopoly position of men's trade unions. On the other hand, in the case of similar work the average ratio is likely to be less than unity on account of the greater sickness rate among women; let us put it at 0.9. But again, over the whole of industry the average woman has a less skilled

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job than the average man, so that the ratio must be further reduced. In the absence of a lengthy investigation into the occupational grouping of the two sexes, we shall assume that the true ratio is approximately the mean of 0.9 and 0.5, i.e. that $s = 0.7$.

5. The information in paragraph 4 together with data on unemployment, an assumption about the post-war level of unemployment, and an assumed rate of growth of the wage earning population, may be used to make an estimate of wage earners in employment in 1944. Writing j for the annual proportionate growth of the wage earning population and k for the post-war unemployment proportion, it will be assumed that

$$j = 0.002$$

$$k = 0.05, \text{ i.e. the equivalent of 800,000 male wage earners unemployed; see below.}$$

The position in 1944 can be worked out either from 1938 or from 1941. Provided we adopt the same assumptions in both cases and provided that any constants used are accurate, we should reach the same conclusion from each starting point. The two calculations for 1944 are as follows:-

(1) Beginning with 1938

Male wage earners in work	10.53	
" " " unemployed	<u>1.41</u>	
	11.94	11.94
Female wage earners in work	4.39	
" " " unemployed	<u>0.46</u>	
	4.85	
4.85 x s		<u>3.40</u>
		15.34
15.34(1 + jt) $j = 0.002, t = 6$		15.52
Assumed permanent increase in female labour force resulting from the war	0.25	
0.25 x s		<u>0.18</u>
		15.70
<u>Less</u>		
Wage earners retained in H.M. Forces on the assumption that these consist of 1.00 million men -	0.40	
Occupied wage earners in 1944		<u>15.30</u>
15.30 (1 - k): $k = 0.05$		<u>14.53</u>

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On these assumptions the employed wage earning labour force in 1944 will be equivalent to 14.53 million men.

(2) Beginning with 1941

Male wage earners in work	9.69	
" " " unemployed	0.21	
" " " in H.M. Forces	<u>2.11</u>	
	12.01	12.01
Female wage earners in work	5.31	
" " " unemployed	<u>0.21</u>	
	5.52	
5.52 x s		<u>3.86</u>
		15.87
15.87(1 + jt): j = 0.002, t = 3		15.97
Increase in female wage earners in work between 1938 and 1941 less decrease in unemployment of female wage earners over the same period	0.67	
Less		
s(0.67 - 0.25)	-	0.29
Wage earners retained in H.M. Forces on the assumption that these consist of 1.00 million men	-	<u>0.40</u>
Occupied wage earners in 1944		15.28
15.28 (1 - k): k = 0.05		<u>14.52</u>

On these assumptions the employed wage-earning labour force in 1944 will be equivalent to 14.52 million men.

6. It will be convenient at this point to set out the method for arriving at the number of wage earners in the Forces given the size of the Forces. This is important since in the light of plans for demobilisation it is probably possible to make an estimate of the size of the Forces at various intervals after the war in place of the round figure used above.

It appears from a comparison of unemployment books surrendered and entrants into H.M. Forces that about 75 per cent of all entrants since the beginning of the war have been wage earners. At the beginning of the war there were about 468,000 men in H.M. Forces. Hence writing

T = all members of H.M. Forces in millions

W = peace time wage earners in millions

/we

we have

$$W = 0.75(T - 0.468)$$

It is of course possible that the figure 0.468 is unduly swollen by abnormal additions to the forces in the period just before the war. If this be so, a figure smaller than 0.468 should be taken, in which case W would, of course, be larger for any given value of T.

7. It is possible to construct an index of hours worked in the following manner:-

Let E_0 = average actual hourly earnings in year 0 i.e. 1938

W_0 = average hourly wage rates in year 0

H_0 = average normal hours in year 0

g = average ratio of overtime to normal rates of pay and $e_0, w_0,$

$h_0,$ and n_0 be the values of E, W, H and N in a single industry in Year 0. Then

$$E_0 = \frac{S(e_0 n_0)}{S(n_0)}$$

$$W_0 = \frac{S(w_0 n_0)}{S(n_0)}$$

$$H_0 = \frac{S(h_0 n_0)}{S(n_0)}$$

where S is a summation sign.

The proportionate change in hours between year 0 and year 1 is equal to

$$\frac{1}{g} \left\{ \left(\frac{E_1}{W_1} - \frac{E_0}{W_0} \right) + \left(\frac{H_1}{H_0} - 1 \right) (g - 1) \right\}$$

In order to evaluate this expression we shall assume that average normal hours have remained unchanged, i.e. that $H_1 = H_0$; that $g = 1.5$; that, in view of the first assumption above, an index of weekly wage rates can be taken to represent the series W; and, finally, that on the average hours were normal in 1938. This being so, current hours as a proportion of the hours worked in 1938 are given by

$$0.3 + \frac{0.505 E_0}{W_0}$$

Where

E_0 = average current earnings

W_0 = average current wage rates as measured by Bowley's wage index on the base August 1939 = 100.

We thus obtain as an index of hours of work on the base of 1938 = 1.000 the figure of 1.059 for 1940 and 1.089 for 1941.

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It appears from studies on hours of work and fatigue that the weighted average of production in an hour of overtime is approximately 88 per cent of production in a normal hour. Accordingly, it would appear that additional working hours added some 5.2 per cent to the labour force in 1940 and about 7.8 per cent in 1941. The assumption that in the post-war period there is a return to the average hours worked in 1938, that is that $h = 0$, can therefore be seen to imply a considerable reduction in effective employment.

8. No data are available on z , the fall in the average productivity of wage earners due to bringing into industry progressively less efficient workers, but it does not seem likely that a reduction of more than 5 per cent of the labour force should be made to take account of the fact that new recruits to industry are less efficient than the average peace time worker. This is very roughly equivalent to assuming that the productivity of the average recruit is about 75 per cent of that of the normal peace time worker. Any fall in efficiency through time due to the necessity of tapping sources of labour with lower and lower productivity is assumed to be offset by the increasing efficiency of past recruits resulting from greater experience at their work.

We need to consider the probable level of z after the war. No doubt z will tend to return to zero, but against this must be set the loss of skill of many of those who have served in H.M. Forces, which will be felt at any rate in the short run, and also the fall in productivity due to a partial return in the short run, at any rate, to the restrictive Trade Union practices which have been abandoned during the war. Two calculations will therefore be made; one on the assumption that $z = 0$ and the other on the assumption that $z = 0.025$, which should make adequate allowance for loss of skill during the war.

9. The second factor is productivity. In 1938 this may be estimated as follows:-

$$P_m = \frac{Y - (A + B + C)}{(N_m + sN_w)}$$

where p_m is the net output per head of male wage earners. The value of this constant is £298. This productivity may be assumed to increase at a rate r per annum, so that at the end of t years productivity will be -

$$p_m (1 + r)^t$$

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Under peace time conditions it is usual to assume that productivity increases at the rate of about 1.5 per cent per annum so that r would normally be 0.015. On the other hand it is argued that war time gains in efficiency will not be fully retained in the change from war time to peace time output. It is not altogether easy to see why this should be so to any great extent since throughout the war, production of consumption goods still remains a fairly large part of total production and it is not unreasonable to suppose that it will be possible to apply most of the war time technical advances to peace time production. This process of re-organisation may however take time, so two calculations will be made with $r = 0.010$ and 0.015 respectively. For the sake of interest a third calculation will be made on the assumption that $r = 0$.

10. Finally allowance must be made for changes in factor costs. To measure this an index of wage rates has been used. Although this is clearly inadequate in theory its use may perhaps be justified by the fact that while the earnings of the various factors of production have moved differently, the general movement may not have been very different from that of wages.

Bowley's wage rate index, denoted by c , has been used to measure changes in wage rates. The proportionate increase in 1941 over 1938 was 0.224. It is now nearly 0.3 and it will be assumed that $c = 0.3$ in what follows.

11. The estimate of the net national income at factor cost may now be summarised thus -

$$Y = A+B+C+(1+c)(1+h)(1-z)(N_m + sN_w) p_m (1+r)^t$$

12. The foregoing data and assumptions lead to the following results:-

ESTIMATED NET NATIONAL INCOME IN 1944 AT PRESENT FACTOR COST.

	$r = 0$	$r = 0.010$	$r = 0.015$
$z = 0.025$	6,051	6,388	6,563
$z = 0$	6,192	6,537	6,717

13. The chief assumptions on which these estimates are based may be summarised as follows:-

- (1) The estimate that the employed wage earning labour force will be equivalent to 14.5 million men requires the following main assumptions

(a) that there will be 1.00 million men of all ranks in H.M. Forces in 1944 and that 400,000 of these will be wage earners (see paragraph 5). It may well be that this is too low a figure for the first full post-war year but, if this is so, other factors (particularly (1)(b) and (2) below) are likely to diverge from what is here assumed in a way which will produce a contrary effect on the estimate of the national income.

/(b)

(b) that unemployment among wage earners will be equivalent to 800,000 men (see paragraph 5). This is very considerably higher than the level of 1941 and as much as half a million higher than the present level.

(c) that of all the women who have entered industry or the Auxiliary Services from war time motives or direction, 250,000 will represent a permanent addition to the wage earning labour force (see paragraph 5). This does not seem extravagant and in any case is of minor importance.

(d) that the ratio of the productivity of the average female wage earner to the average male wage earner (s) is 0.7 (see paragraph 4). This is not of great importance, particularly in conditions where the sex composition of industry is not greatly changed, since an alteration in s would to some extent be offset by the value obtained for p_m .

- (2) The average hours worked by wage earners are assumed to fall back to the level of 1938, that is, it is assumed that $h = 0$ (see paragraph 7). It is easily possible that this may not come about at once.
- (3) The two assumptions about z (see paragraph 8) are set out in the main table (see paragraph 12).
- (4) The three assumptions about r (see paragraph 9) are set out in the main table (see paragraph 12).
- (5) The net income from foreign investments is assumed to be £100 millions in 1944 (see paragraph 2).
- (6) The calculations are based on a level of factor costs 30 per cent higher than those ruling in 1938 (see paragraph 10). At this higher level, the national income of 1938 would have been some £5,980 millions and that of 1941 some £6,734 millions.

14. The estimates in section 2 of the foregoing paper require a knowledge of the effect on the net national income of variations in (i) the number of men in H.M. Forces, (ii) the number of wage earners in work reduced to an equivalent number of men, and (iii) the level of factor costs. The calculations made in section 2 were derived from the following equations from which the effect of assumptions other than those adopted can easily be seen.

(i) Write Y^1 for the change in the net national income due to the transference of one man from civil life to H.M. Forces. Then

$$Y^1 = 210 - 0.75 (1 + c)(1 + h)(1 - z)(1 - k) 298 (1 + r)^t$$

Assuming that

$$\begin{aligned} c &= 0.3 \\ h &= 0 \\ z &= 0.025 \\ k &= 0.05 \\ r &= 0 \\ t &= 6 \end{aligned}$$

we have

$$Y^1 = 210 - 0.75 \times 1.3 \times 1.0 \times 0.975 \times 0.95 \times 298 \times 1.0$$

$$= - 59$$

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whence each 250,000 men transferred to H.M. Forces would reduce the net national income by

$$£59 \times 250,000 = £15,000,000 \text{ appr.}$$

If these assumptions regarding z and r are replaced by the other extreme, namely that $z = 0$ and $r = 0.015$, then

$$\begin{aligned} Y^1 &= 210 - 0.75 \times 1.3 \times 1.0 \times 1.0 \times 0.95 \times 298 \times 1.03 \\ &= -92 \end{aligned}$$

whence each 250,000 men added to H.M. Forces would reduce the net national income by £23,000,000.

It may therefore be said that according to the assumptions made each 250,000 men transferred from H.M. Forces will increase and each 250,000 men allowed to remain in H.M. Forces will decrease the net national income by some £15m to £23m.

(ii) Write Y^{11} for the change in the net national income due to the re-employment of one unemployed male wage earner. Then

$$Y^{11} = (1 + c)(1 + h)(1 - z) 298 (1 + r)^t$$

On the same assumption as before we find that this expression lies between 378 and 423, whence the reduction of unemployment by the equivalent of 250,000 male wage earners would increase the net national income by some £95m. to £106m.

(iii) Write Y^{111} for the change in the net national income due to a 1 per cent increase in factor costs. Then

$$Y^{111} = \frac{Y - (A + B + C)}{100}$$

from which it can be seen that, according to the assumptions made, a 2.5 per cent increase in factor cost would increase and a 2.5. per cent reduction would decrease the net national income by between

$$£5,476,000,000 \times 0.025 = £137,000,000 \text{ appr.}$$

and

$$£6,142,000,000 \times 0.025 = £154,000,000 \text{ appr.}$$

15. The problem in the last paragraph of section 4 in the foregoing paper can be treated by the same method as was used in 14(a) above. For, in the conditions assumed

$$\begin{aligned} Y^1 &= 203 - 0.75 \times 1.3 \times 1.078 \times 0.95 \times 298 \times 1.044 \\ &= -83 \end{aligned}$$

$$W = 2.11$$

so that if all the men who had joined H.M. Forces since the war began were to have returned to their civil occupations, the net national income would have been increased by

$$£103 \times 2,110,000 = £217,000,000 \text{ appr.}$$

that is the 1941 net national income at factor costs 30 per cent above 1938 would have been £6,95m.

16. The table in paragraph 12 suggests the following broad conclusions. It seems likely that immediately after the war the net national income may not be greatly in excess of the level in 1938. But in a short space of time, perhaps not more than a year or two, it should rise to as much as £6,500 million or more in terms of present factor costs and thereafter rise at a more moderate rate, perhaps about £100 million per annum, depending largely on improvements in industrial technique, organisation etc.

J.R.N.S.

29.5.42