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THE CENSUS OF PRODUCTION AND THE NATIONAL DIVIDEND.

THE Report of the First Census of Production of the United Kingdom (1907)¹ affords an opportunity of considering the statistics of production and of income with reference to each other, and with reference to the economic conceptions of production, distribution, value, and income.

In the General Report by Mr. A. W. Flux, which precedes the detailed tables, we find not only a descriptive summary of the new statistical results obtained, but also an attempt by means of sweeping and bold estimates to obtain a complete valuation of all goods and services produced or rendered in the United Kingdom, and a comparison of this total with current estimates of income. In the following summary table, which is re-arranged from the very involved analysis in the report, the only values that were obtained directly by statistical inquiry are those of net outputs, customs and excise, and excess of imports; the rest are estimated from rough and imperfect data. The merchandising and carriage of goods from the ports and (in various stages of manufacture) from factory to factory is estimated as costing from 10 to 15 per cent. of the value of imported materials; and the transport of goods from the ports or factories to the retailers appears to be taken as about 25 per cent. of their value, while 35 per cent. more is added for retailers' profits and expenses. From comparison with the population census of 1901, it is supposed that about one million workers employed in small workshops or on their own account were omitted from the census, and it is suggested that their net product averages about £50 per person per annum. The increase of investments abroad is from Sir G. Paish's estimate read to the Royal Statistical Society. The cost of maintenance of capital is based on a rough estimate of the value of buildings and plant combined with a sketchy inquiry as to the percentage to be allowed. The remaining item, as to services not productive industrially, is discussed below. Though the estimates have so slight an apparent basis, it seems

¹ Cd. 6,320.

probable that a good deal of care has been spent in considering them, and wide margins of error (expressed as $\pm$ in the following table) are assigned in the report, so that it is believed confidently by the compilers that "gross inaccuracy is excluded."

TABLE I.

	£	
Net output of industries and mining	690,000,000	
Certain raw materials produced and used at home	18,000,000	
Net output of agriculture ...	180,000,000	
Net output of fisheries ...	12,000,000	
Result of direct inquiry ...		900,000,000
Estimated omissions ...	50,000,000	
Duties on home goods ...	48,000,000	
Merchanting and carriage before completion ...	35,000,000 $\pm$ 8,000,000	
Merchanting and carriage of exports to ports ...	45,000,000 $\pm$ 10,000,000	
Merchanting and carriage and retailers' expenses:—		
of home goods	365,000,000 $\pm$ 50,000,000	
of imports ...	127,000,000 $\pm$ 17,000,000	
Occupation of houses, personal services, &c. ...	375,600,000 $\pm$ 25,000,000	
Total of estimates and duties		1,045,000,000 $\pm$ 110,000,000
<i>Value of net output of goods and services produced or rendered in the United Kingdom</i>		1,945,000,000 $\pm$ 110,000,000
Value at port of imports less value of exports... ..	145,000,000	
Duties on imports	15,000,000	
Increase in value of investments abroad	100,000,000	
		260,000,000
<i>Value of goods and services available for consumption or saving by the people of the United Kingdom...</i>		2,205,000,000 $\pm$ 110,000,000
Less cost of maintenance of home capital		175,000,000 $\pm$ 5,000,000
Net income of the United Kingdom... ..		£2,030,000,000 $\pm$ 115,000,000 ¹

The total thus obtained on the productive side may be compared with total income as hitherto measured.

TABLE II.

	£
1907. Estimated income above income tax limit ...	880,000,000
" wages	740,000,000
" intermediate income	325,000,000
Total income	£1,945,000,000

¹ Of course the various errors may tend to balance one another, and the probable error of the sum is less than the total of the probable errors of the parts; but it hardly seems worth while to apply the theory of probability to such rough estimates, especially as no error is assigned to omissions or to investments. The total given in the report, where the items are grouped differently, is £1,918,000,000 to £2,158,000,000.

In this table Income (above £160) and Wages are estimated on the method used in *THE ECONOMIC JOURNAL*, 1904, p. 459, brought up to date; while Intermediate Income, that received as small salaries or profits, or small pensions, interests, &c., is estimated from the Report¹ on Incomes to the British Association, printed in the *Statistical Journal*, December, 1910, modified for application to 1907. If we may suppose that the various statements in Table I. were not influenced by knowledge of aggregate income as generally estimated, the agreement is very remarkable, for no one can hope to get such a total correct within 5 per cent. It certainly appears that "gross inaccuracy is excluded" so far as the total is concerned, if we may regard an error of 5 per cent. as venial.

The total may be exhibited in another form :—

TABLE III.

	£	
Gross output of agriculture, mining, and industry, including raw material, home or imported, and excluding duplication	1,360,000,000	
Carriage, merchandising and retailing connected with home goods ...	442,000,000	
Duties on home goods	48,000,000	
<i>Value of goods produced or finished at home when delivered to customer or on ship</i>		1,850,000,000
Imports ready for consumption ...	220,000,000	
Duties on, transport and retailing of, such imports	140,000,000	
		360,000,000
<i>Total for consumption or export</i>	2,210,000,000	
Subtract exports... ..		465,000,000
<i>Total goods for home consumption or saving...</i>	£1,745,000,000	± 80,000,000 ²

Net output, as used in Table I., "expresses completely and without reduplication the total amount by which the value (at works) of the products of . . . the group, taken as a whole, exceeded the cost (at works) of the materials purchased from outside." Gross output in Table III. includes the value of raw materials, and of goods imported and manufactured or finished at home; but goods passing through more than one factory are only counted once. The value of material goods ready for use was then £1,745,000,000.

It was found possible to separate capital goods, "such as, by

¹ Before this report (September, 1910) intermediate income had been estimated by me at £100,000,000 less.

² Then the former total, £2,030,000,000, is thus obtained :—subtract £175,000,000 as above and also £15,000,000 imports for maintenance of capital or stock, add £100,000,000 invested abroad, and £375,000,000 houses, services, &c.

their nature, must be employed in making or repairing machinery, plant, or buildings," from consumption goods "such as are adapted for the personal use of consumers" both in the Census of Production and in the Imports. The value of capital goods so found, with an estimate for transport, is added to the (net) value of new buildings and other works of construction, maintenance or repair, as shown in the Census, and the total £355,000,000 is obtained. Of this about one-half is allotted to the maintenance of capital values in their condition, and the other half remains for re-investment. A further relatively small sum of imports, £65,000,000, is regarded as maintaining or increasing the value of personal goods (furniture, jewellery, &c.), say £15,000,000 for maintenance and £50,000,000 for increase.

We may then compile the following tables :—

TABLE IV.

		£
Material goods for personal consumption		1,325,000,000
Capital goods, for maintenance of plant, &c.		175,000,000
" " " consumer's stock		15,000,000
" " " investment		180,000,000
Increase of consumers' stock		50,000,000
Total as in Table III.... ..		<u>1,745,000,000</u>

and finally,

TABLE V.

	£	£
Personal consumption—Material goods ...	1,325,000,000	
" Services and houses	375,000,000	
Material and immaterial goods used		1,700,000,000
Additions to capital and stock at home	230,000,000	
" investments abroad ...	100,000,000	
Savings ...		330,000,000
Total income ...		2,030,000,000

The tables now given arise directly from the estimates in Mr. Flux's report, with alterations in arrangement and wording. It is not proposed to criticise here the individual figures. Whatever alteration might be made in detail if fuller information were available, it is not likely that the general relations of the parts would be much affected.

"Everything that is produced in the course of a year, every service rendered, every fresh utility brought about, is a part of the national income. We must be careful not to count the same thing twice."² Very great care has been taken in the Census of

¹ Cf Professor Pigou, *Wealth and Welfare*, p. 354. "... Mr. Bowley's estimate, that one-sixth or one-seventh of the national dividend is converted into capital annually." For *estimate*, read *guess*. I cannot find now where I published it.

² Marshall, *Principles*.

Production not to duplicate entries. The governing method was to reckon the net output of each unit, by subtracting the value of all things delivered to the unit from that of all things delivered by it. In the case of industry, allowance is finally made for the maintenance of capital; in agriculture it had to be assumed that the condition of the soil was on the whole the same at the end as at the beginning. In the case of mines and quarries, no allowance is made for depletion of value; royalties are thus treated as income. In those cases such as the postal service, shipbuilding in dockyards, and other undertakings by the central or local governments, the product is valued, in one category or another, at the net cost of production; thus, if profits are made they are nowhere included as income, and, if there is no question of profits, it is assumed that there is no excess of value of the finished product over the cost. Thus a substantial part of the national income is ignored.

No serious attempt is made, or can be made, to separate goods from services. In Table I. we pass from the net output of material goods to a composite item including transport and merchants' services, and then to direct services of persons and direct services of capital, such as house accommodation. We are left with the familiar difficulties that furniture provides satisfaction of the same nature as houses, and that there is no line that separates paid from unpaid domestic services. In any case, the total value of production, like the total income, is a matter of arbitrary delimitation.

Some people attach importance to the aggregate of material goods ready for consumption that are available for a nation. They will find it very difficult to obtain any estimate from the report, even if they can frame a definition. The material goods for personal consumption of Table V. (£1,325,000,000) are called in the report "goods and services consumed or exchanged for services by classes engaged in production and distribution," and are intended to be reckoned at the prices paid by the consumer as they reach his hands. The next item, abbreviated into "services and houses," £375,000,000 ("goods consumed or exchanged for services by classes engaged in supplying services" in the Report), is composed of several roughly estimated items: (i) Income from ownership of buildings not used for production, assumed to be the value of the services rendered; (ii) railway and tramway revenue from passenger service, less value of coal consumed and destruction of capital goods, and less receipts from commercial travellers; this is assumed to equal the value of services rendered to non-business travellers; it involves the distinction between travelling on

business and of necessity or on pleasure, and assumes that the value of a railway ticket is equal to the price paid for it; (iii) the part of postal service which is not for business; (iv) the services of domestic servants, taken as equal in value to the aggregate of wages and the value of board and lodging; (v) the services of the central and local government, so far as not already reckoned in production, whether as duties or as goods produced by the governments; (vi) the services of the professional and artistic classes and of the business groups not already reckoned in (v) or in the Census; (vii) some other persons rendering direct service.

Two points arise out of this category: first, that there is no universal means of valuing services rendered in production apart from services rendered directly; second, that such services can only be valued by estimating the income of those performing them, while material goods and a great part of transport services can be valued by their selling price in the open market. The distinction, if there be one, between the value on the productive side and the income of occupied persons on the receipt side, can only be preserved over an undefined part of national income. In fact, we get only a very partially new estimate of national income from the Census. The "net product" is exhausted (after maintenance of capital) by rents, interests, profits, salaries and wages, and these all appear or are estimated in income tax returns, "intermediate" income and wages.

Unfortunately, the Report does not provide material for checking any of the former estimates of income, owing to the classification by industries as a whole, which is necessarily adopted. Thus, the agricultural total would only enable us to get at the unknown total of farmer's profits,¹ if we could isolate agricultural rent and interest and wages by other reckonings, and the estimates are so hazardous as to make the remainder doubtful to a prohibitory degree; and other cases are similar.

It will have been noticed that duties are included in the value of goods to the consumers, and therefore as part of the national income, while the governmental services for which the duties pay are not included. Now a man receiving a professional income of £500 in return for services, may pay £15 in direct taxation, corresponding to £15 worth of governmental services, and have so much less with which to purchase other services; whereas, if he spent £10 on spirits and tobacco, he receives the £10 worth of goods himself, and also pays for (say) £7 worth of government

¹ Practically farmers' incomes are only included in the income tax net assessments if their rents are over £480, and they are then assumed to be one-third of rent

services, as when a purchaser buys a pound of tea and receives a handsome picture into the bargain. This specious argument, that in indirect taxation you get government services for nothing, has, I think, not been noticed by Tariff Reformers!

In the method of the Report the government services paid for by indirect taxation are not counted as of any further value. This seems an unnecessarily complicated method; it would have been simpler to leave out the addition to net product, and value the services in full. But perhaps the writer wished to force readers to consider interesting problems relating to consumers' surplus. Goods in general are worth to all but the marginal purchasers more than they pay for them.

In the case of goods whose price is raised by taxation, so much is cut off from the consumers' surplus and so much is spent on public services; the report assumes that the value of the services equals the amount of taxation, but of course it does not follow that this value equals the detriment to the consumer. In the case of direct taxation the taxed individual is the poorer by precisely the amount of the tax. Hence, whatever way we make our measurements, we are involved in difficult questions of theory and practice. The difficulty originally arises from the fact that value in exchange, which affords the only possible method of valuing production, depends on other factors as well as on the cost of production.

A shifting of taxation from direct collection to indirect would involve (by the method adopted), if the prices rose, an increase in the value of goods and a decrease in the value of services; but official services are equally valuable whether paid for by duties or from income tax, and we can only harmonise the calculation by supposing that lost consumers' surplus is turned into official services behind the back of the accountant. But when part of the incidence of taxation is on the manufacturer (and, of course, in the case of monopoly a great part of it may be), the net product of manufacture, as valued, would fall to the extent of part of the yield of the duty. Taking the extreme case where the manufacturer paid the whole of the duty and did not raise the price of his goods,¹ it appears that the corresponding amount of official services would completely disappear from the aggregate income, whereas in fact there would only be a transference of outgoings to the government from the income-tax payer to the manufac-

¹ So that, e.g. the first and sixth items in Table I. become £680,000,000 and £58,000,000 instead of £690,000,000 and £48,000,000. Then the eleventh item would be reduced from £375,000,000 to £365,000,000 by the subtraction of an additional £10,000,000 from item (v.), p. 58.

turer. On the other hand, in the same case the net assessments to income tax would be reduced, since the manufacturer is only assessed on his profits, and Table II. and Table I. would remain comparable. It appears, then, that the aggregate national income may depend on the method of taxation, by whatever method the aggregate is estimated, even if we suppose that taxation has no effect on the amount of various classes of goods produced. The more successfully taxation is transferred to monopolists, the less the apparent income.

These, and other considerations not arising from the report (such as the difference of marginal utility of money to persons of various incomes, and the continual changes in purchasing power of money), tend to show that Aggregate Income, however measured, is of the nature of a numerical total, whose contents depends on arbitrary definition, and has no very close relation to welfare. Nevertheless, as is generally the case with statistical totals, it can be used for observing changes so great as to render unimportant the probably minor changes in the nature of its content, or changes over a short period when there is strong reason to believe that "other things" are not only "supposed equal" but are, in fact, nearly "equal."

Apart from the analysis of the National Dividend the results of the Census are mainly of statistical, rather than pure economic, interest. Summary excerpts from the tables are likely to give rise to misleading ideas. Thus, one is tempted to say that the net output per wage-earner employed in mining and industry was £110, that (from other data) annual average earnings per wage-earner (man, woman and child) was probably about £50, and that consequently about £60 is produced per wage-earner beyond his wages; while in agriculture the net output per person occupied (including farmers) was £83 in Great Britain, where the average wage was perhaps £45. But these figures are subject to so many qualifications as to be nearly valueless. The net output has to provide for salaries, depreciation of capital, and wear and tear of machinery, interest and advertising, as well as rents, profits, earnings of working employers, and wages, and all these factors differ enormously from industry to industry. In some cases the wage-earner receives the great part of the value of the output, in other cases less than a quarter. The detailed figures are, on the other hand, very useful, for it is possible to tell within limits in the case of separate industries, what is the proportion of wages to the value of net or gross output. Thus, in the cotton industry about 73 per cent. of the gross output or selling value of the goods

goes for materials (including coal), about 17 per cent. to wages, and about 10 per cent. to the other factors just enumerated; or, put otherwise, the wage-earners receive 63 per cent. of the net output. This suggests that after depreciation is met, and advertising, selling expenses and salaries are paid, there is no great margin for increase of wages at the expense of profit.

Other very useful lines of analysis arising from the figures concern the relative importance of different industries as sources of production, and of the relation of home production to imported raw materials and imported manufactured goods; but here, again, so much depends on classification, and there is such enormous variety, that summary quotation is useless.

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