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**THE INCIDENCE OF
INCOME TAXES.**

THE INCIDENCE
OF
INCOME TAXES

BY

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**TO
MY MOTHER**

PREFACE

IN this book an analysis is given of the incidence both of partial income taxes, that is of income taxes which are levied on the incomes arising from particular lines of industry, and of a general income tax. The scope and arrangement of the book is shown in the first chapter. An analytical table of contents is given, showing in detail the topics which are dealt with: it is hoped that it will facilitate the task of the student who may wish to use the book as a text.

My interest in the topic commenced while attending the lectures on public finance of Professor W. R. Scott. Embarkation of the inquiry was encouraged by Mr. J. W. Nisbet, who afterwards did much to assist me in it. I was subsequently much indebted to the kindness and assistance of Mr. R. H. Coase, Mr. J. K. Eastham, Dr. A. L. Macfie and Professor J. Morgan Rees. The distinguished reader for Messrs. Macmillan suggested certain alterations and extensions in the manuscript; and his advice, I believe, led to a substantial improvement in the final form of the book.

Numerous references have been given in the footnotes to different authorities. This has enabled me to acknowledge my main obligations to other writers, among them the great Italian economists De Viti, Barone, Einaudi and Fasiani. It may also assist the student in his further reading.

Part of Chapter VIII is reprinted, by permission of the editors, from *The South African Journal of Economics*, 1937.

January 1939

D. B.

CONTENTS

PART I

THE OLDER THEORY OF THE INCIDENCE OF A GENERAL INCOME TAX

CHAPTER I

INTRODUCTORY	PAGE 3
------------------------	-----------

CHAPTER II

THE THREE ARGUMENTS OF THE OLDER THEORY OF THE INCIDENCE OF A GENERAL INCOME TAX	5
---	---

CHAPTER III

MR. COATES'S THEORY AND STATISTICAL INVESTIGATION	19
---	----

CHAPTER IV

TWO MAIN SOURCES OF AN IMPROVED DOCTRINE: THE <i>COLWYN REPORT</i> AND DE VITI DE MARCO'S <i>FIRST</i> <i>PRINCIPLES</i>	30
--	----

PART II

THE INCIDENCE OF PARTIAL INCOME TAXES

CHAPTER V

A TAX ON THE INCOME OF A MONOPOLIST	45
---	----

CHAPTER VI

THE INCIDENCE OF A PROPORTIONAL INCOME TAX ON THE DIAMOND MONOPOLY IN SOUTH AFRICA	57
---	----

X THE INCIDENCE OF INCOME TAXES

CHAPTER VII

THE INCIDENCE OF A PARTIAL INCOME TAX	PAGE 65
---	------------

CHAPTER VIII

THE INCIDENCE OF A PROPORTIONAL INCOME TAX AND OF THE PRESENT INCOME TAX ON SOUTH AFRICAN GOLD MINING	82
---	----

PART III

THE INCIDENCE OF A GENERAL INCOME TAX

CHAPTER IX

THE CONDITIONS ASSUMED AND THE METHOD TO BE FOLLOWED	119
---	-----

CHAPTER X

ON THE DISREGARD OF THE EXPENDITURE OF THE TAX PROCEEDS IN THE THEORY OF INCIDENCE	134
---	-----

CHAPTER XI

THE EFFECT OF THE INCOME TAX IN DIRECT ALTERATION OF DEMAND SCHEDULES	145
--	-----

CHAPTER XII

THE EFFECT OF THE INCOME TAX ON THE SUPPLY OF LABOUR PER INDIVIDUAL	157
--	-----

CHAPTER XIII

THE EFFECT OF THE INCOME TAX IN CHANGING THE SIZE OF POPULATION IN SHORT PERIODS AND IN THE LONG PERIOD	168
---	-----

CHAPTER XIV

THE EFFECT OF THE INCOME TAX ON THE QUANTITY OF CAPITAL IN THE SHORT AND IN THE LONG PERIOD	180
--	-----

CONTENTS xi

CHAPTER XV

	PAGE
CONCLUSIONS. THE INCIDENCE OF A GENERAL INCOME TAX IN A STATIONARY COMMUNITY	196

CHAPTER XVI

CONCLUSIONS (<i>continued</i>). THE INCIDENCE OF A GENERAL INCOME TAX IN A PROGRESSIVE COMMUNITY	207
--	-----

CHAPTER XVII

THE EFFECT OF THE INCOME TAX ON UNCERTAINTY-BEARING	216
---	-----

CHAPTER XVIII

THE BRITISH INCOME TAX : HOW SHOULD WE ALTER IT ?	227
---	-----

PART IV

ADDITIONAL PROBLEMS

CHAPTER XIX

THE THEORY OF DOUBLE TAXATION OF SAVINGS	269
--	-----

CHAPTER XX

CO-OPERATIVE SOCIETIES AND THE INCOME TAX	285
---	-----

APPENDIX	307
--------------------	-----

INDEX OF NAMES	315
--------------------------	-----

ANALYTICAL TABLE OF CONTENTS

PART I

THE OLDER THEORY OF THE INCIDENCE OF A GENERAL INCOME TAX

CHAPTER I

INTRODUCTORY

CHAPTER II

THE THREE ARGUMENTS OF THE OLDER THEORY OF THE INCIDENCE OF A GENERAL INCOME TAX

1. This theory held that the incidence of an income tax is not shifted because :
 - (i) it gives rise to no transfer of resources between different branches of industry.
 - (ii) it leaves the number of firms in each branch the same as before, and
 - (iii) it leaves the output of each firm the same as before.
2. Arguments (i) and (ii) examined and found defective. The kernel of truth in the older theory is contained in argument (iii).

CHAPTER III

MR. COATES'S THEORY AND STATISTICAL INVESTIGATION

1. Deficiencies of his time analysis.
2. Coates's position in relation to the effects produced by the income tax on the supply of capital and the rate of interest is unsatisfactory.
3. As is his treatment of the distribution of the tax proceeds by the State.
4. His statistical evidence and its object.
5. The representative firm and the interpretation of Mr. Coates's statistics.

CHAPTER IV

TWO MAIN SOURCES OF AN IMPROVED DOCTRINE: THE COLWYN REPORT AND DE VITI DE MARCO'S FIRST PRINCIPLES

Section I. *The "Colwyn Report" (1927)*

1. The *Report's* definition of incidence and effects. Defects of this definition.
2. Some shortcomings of the Committee's treatment of "incidence".
3. It contains no real treatment of the expenditure of the tax proceeds.
4. In dealing with "effects", the *Report* takes account of the variation of supplies of factors of production through time — a very important improvement on existing doctrine.

Section II. *De Viti de Marco: "First Principles of Public Finance" (1928)*

5. De Viti shows that in considering the incidence of a tax, the expenditure of the revenue which it provides must be taken into account.
6. De Viti uses general equilibrium analysis and has a definite conception of the State.
7. If we adopt the improvements introduced by the *Colwyn Report* and by De Viti, a more satisfactory theory of the incidence of a general income tax seems to be attainable.

PART II

THE INCIDENCE OF PARTIAL INCOME TAXES

CHAPTER V

A TAX ON THE INCOME OF A MONOPOLIST

1. If the private factors of the monopolist are in fixed supply to the business, output and price are unaffected by the tax.
2. If his private factors are not in fixed supply, but have alternative uses, output is reduced by the tax and price increased. This is the more important case for practice.
3. Uncertainty present and the private factors of the monopolist in fixed supply. (a) If he considers only the curves of most probable revenue and costs, price will be unchanged. (b) If he takes into account the whole schedule of expected profits corresponding to each price, there may be a rise or a fall in price.
4. Uncertainty present and the private factors of the monopolist in variable supply. (a) If he considers only the curves of most probable revenue and costs, there will be a rise in price. (b) If he takes into account the whole schedule of expected profits corresponding to each price, then price is still likely to rise.

CHAPTER VI

THE INCIDENCE OF A PROPORTIONAL INCOME TAX ON THE
DIAMOND MONOPOLY IN SOUTH AFRICA

1. Introductory.
2. History of taxation of the diamond industry.
3. The appropriate assumptions for analysing the effects of the tax.
4. In the long run the burden rests entirely on the shareholders of De Beers and on the purchasers of diamonds.
5. In the short period wage rates and the prices of stores will fall.

CHAPTER VII

THE INCIDENCE OF A PARTIAL INCOME TAX

1. Graduation may be either personal or impersonal.
2. Assumptions made.
3. How a tax affects the return to the fixed factors in the short period.
4. An analysis by means of diagrams of the cost situation in the short period, and the rise in price which takes place in the long period.
5. Removal of the assumption of fixed technical coefficients.
6. Extension of the treatment to make allowance for the altering price expectations of buyers and producers.
7. Extension to the case in which the factors of production are not in perfectly elastic supply to the industry.
8. A partial income tax graduated in an impersonal fashion will be capitalised or amortised.
9. A tax graduated in a personal fashion will also be capitalised.

CHAPTER VIII

THE INCIDENCE OF A PROPORTIONAL INCOME TAX AND OF
THE PRESENT INCOME TAX ON SOUTH AFRICAN GOLD MINING

1. Introductory, explaining the present position in the South African gold-mining industry.
2. The assumptions appropriate to the case.
3. The incidence of a proportional income tax on gold mining in the short and long periods, and concluding with a summary.
4. The incidence of the present tax on gold mining, following Dr. Busschau's method of analysis.
5. The incidence of the present tax (*continued*), and dealing with the long as well as the short period.
6. Criticism of Busschau's analysis.
7. Discussing the choice between a proportional and the present income tax.
8. Another type of tax suggested that will fall purely on rent.

PART III

THE INCIDENCE OF A GENERAL INCOME TAX

CHAPTER IX

THE CONDITIONS ASSUMED AND THE METHOD TO BE FOLLOWED

1. Seligman's use of the words incidence and effects.
2. These words as used by the Colwyn Committee and by Silverman.
3. Cannan, Marshall and Edgeworth. Our usage of the terms.
4. Treatment of the Time Element in the theory of incidence.
5. The methods of Lausanne might seem to be appropriate to the problem. We adopt, however, partial equilibrium methods.
6. Some of the MAIN ASSUMPTIONS involved. The method employed is that of stationary states. The position of knowledge and uncertainty in the method.
7. The industries in the community are assumed to be working under conditions of perfect competition. The "key to the problem".
8. Explains why we assume a small increase to be made in the height of the income tax.

CHAPTER X

ON THE DISREGARD OF THE EXPENDITURE OF THE TAX
PROCEEDS IN THE THEORY OF INCIDENCE

1. The classical theory disregards the expenditure. But we *should always so far as possible* take into account effects produced by any increased expenditure which the tax renders possible.
2. Edgeworth, Marshall, Bastable, Hobson, Stamp and Seligman in relation to this problem.
3. Wicksell in 1896 laid the foundations of a more comprehensive theory.
4. Barone and Einaudi. Since De Viti's work appeared, the practice of taking the proceeds into account, has become more general.

CHAPTER XI

THE EFFECT OF THE INCOME TAX IN DIRECT ALTERATION
OF DEMAND SCHEDULES

1. The allocation of the governmental expenditure is determinate.
2. How the consumption of the individual alters when his income either increases or diminishes.
3. In the short period the *amount* of consumption goods consumed by the poor will increase, that consumed by the rich will diminish.
4. On the *proportion* of the national income of goods and services which is consumed by the working classes in the long period.

5. In the short period the *amount* of indivisible goods consumed by the community will increase.
6. On indivisible goods as a *proportion* of the national income of divisible plus indivisible goods in the long period.
7. In the short period the prices of the goods consumed by the poor will rise, those consumed by the rich will fall. In the long period the relative prices of goods will depend on the new levels of factorial prices.
8. The series of time changes set up from the side of demand, in the rewards of the factors of production.

CHAPTER XII

THE EFFECT OF THE INCOME TAX ON THE SUPPLY OF
LABOUR PER INDIVIDUAL

1. Knight's argument.
2. Shown by indifference curves that when an income tax is imposed, the individual may either work longer or shorter hours.
3. The curve of supply of labour for the individual derived from the indifference curve diagram.
4. On balance the labour supply of the working classes will fall.
5. How the economic effects will work themselves out.

CHAPTER XIII

THE EFFECT OF THE INCOME TAX IN CHANGING THE SIZE OF
POPULATION IN SHORT PERIODS AND IN THE LONG PERIOD

1. Introductory.
2. Effect on death rate in the short and in the long period.
3. Birth rate of the lower-income classes rises in the short period immediately following on the imposition of the tax.
4. A fall takes place in the birth rate of the lower-income classes and of the higher-income classes, after the lapse of a further period of time and also in the long period.
5. Summary.
6. The changing age-composition of the population will cause changes in demand schedules through time, and capital wastage.

CHAPTER XIV

THE EFFECT OF THE INCOME TAX ON THE QUANTITY OF CAPITAL
IN THE SHORT AND IN THE LONG PERIODSection I. *Analytical*

1. Three assumptions.
2. In the short period the volume of capital contracts.

3. After the lapse of the long period the volume of capital will be smaller.
4. The depreciation quota of capital in each year is only a small percentage of the whole; and on this account the rise in the rate of interest is slower. But the changing size and age-composition of the population also cause capital wastage. Had population remained constant, the rate of interest in the long period would have been higher than initially.
5. In the long period the quantity of capital *per head* may have declined or have risen; but a decline seems to be the more probable outcome.

Section II. *Criticism of some contrary views expressed by De Viti and Einandi*

6. These views stated.
7. The conditions under which the views would be valid.

CHAPTER XV

CONCLUSIONS

THE INCIDENCE OF A GENERAL INCOME TAX IN A STATIONARY COMMUNITY

1. Variations in capital and population considered together: their economic effects in the period between the imposition of the tax and the date (OA + 15) years.
2. Their economic effects between the date (OA + 15) years and the long period.
3. In the long period the worker's standard of living, including in this the benefits he derives from social services, may be either higher or lower than initially — which we cannot say definitely.
4. Variation in the supply of labour per head in the short and long period taken into account.
5. Summary.
6. The changing structure of demand and production in the short period.
7. The consumption of divisible and indivisible goods in the long period. Movements in the relative prices of divisible goods in the long period.

CHAPTER XVI

CONCLUSIONS (*continued*)

THE INCIDENCE OF A GENERAL INCOME TAX IN A PROGRESSIVE COMMUNITY

Section I. *Analytical*

1. We consider the case of a community which is progressing continuously and smoothly. The main effects of the tax will be the

same as those for the stationary community, with an additional influence on risk-bearing.

2. Effect on population.
3. On capital.
4. On risk-bearing.
5. On supply of labour per individual.
6. On demand schedules and prices.

Section II. The case of Great Britain

7. The demand for capital on account of new entrants into industry, and that arising from technical progress, is going to fall off. Up to some point national income and national investment will both be stimulated by increasing the consumption of the country through higher levels of income taxation.
8. We believe, however, that the British Income Tax has already passed the point up to which this is so.

CHAPTER XVII

THE EFFECT OF THE INCOME TAX ON UNCERTAINTY-BEARING

1. The meaning of uncertainties. The willingness of investors to supply uncertainty-bearing may be increased or diminished.
2. An alternative proof of the same.
3. There is wide agreement, however, that the British Income Tax does in fact reduce the willingness of investors to provide uncertainty-bearing.
4. The demand for uncertainty-bearing will also be reduced by the tax: and the total effect of the tax will be to reduce the amount of uncertainty-bearing undertaken by the community.
5. Note. Since the war the Income Tax has been one of the factors tending to depress the heavy industries of Great Britain.

CHAPTER XVIII

THE BRITISH INCOME TAX: HOW SHOULD WE ALTER IT?

Section I. Judging a good tax system. Some remarks on method

1. The incidence of taxes should be taken into account in determining the best tax distribution. But though all recognise this to be true, few act on the principle.
2. Outline of "the most appropriate" method in the theory of distribution of taxation.
3. This method reasons in terms of the objective changes produced and can claim the support of Barone, Benham and Simons.
4. We point out three ends of policy which we believe we should strive to attain:
 - (A) a more even distribution of a given national income,

XX THE INCIDENCE OF INCOME TAXES

- (B) to reduce the extent of the impending fall in the size of the country's population,
- (C) to maintain, so far as possible, the rate of growth in the size of the national income.

Section II. *Probable movements in population and national income, 1940-70; and the structure of the British Income Tax (1937-38)*

- 5. The rate of increase of the national income will depend on technical progress and on the size of the occupied population of the country. The probable future size of the national income.
- 6. The rates of Income Tax and Sur-Tax payable by the individual and the various allowances made.
- 7. Joint-stock companies pay standard rate of Income Tax on moneys placed to reserve.

Section III. *How to alter the Income Tax*

- 8. To secure end A, the social services should be extended, this being financed out of Income Tax,
- 9. To secure end B, child allowances in the Income Tax should be much increased and a scheme of family allowances introduced for poorer parents.
- 10. To secure end C, income consumed should be taxed at a higher rate than income saved.
- 11. The suggestion, supported by Fisher, Einaudi and Pigou, that savings should be totally exempt from an income tax, seems less desirable than this.
- 12. Summary of proposals.

Section IV. *Two possible objections to the proposals*

- 13. A high rate of Income Tax would be an embarrassment should war occur.
- 14. If we believe that war is probable, the proceeds of higher rates of Income Tax and Sur-Tax should be devoted to rearmament instead of to the ends A and B mentioned above.
- 15. Some authorities believe that increasing the Government's budgetary income and expenditure makes stability of the economic system more difficult to achieve.

PART IV

ADDITIONAL PROBLEMS

CHAPTER XIX

THE THEORY OF DOUBLE TAXATION OF SAVINGS

- 1. The theory in the works of J. S. Mill, Fisher and Pigou.
- 2. The main reason for not accepting the view that saving is double-taxed.
- 3. An alternative view put forward.
- 4. This view illustrated by a diagram.

5. What is the economic *significance* of the statement that an income tax differentiates against savings?
6. The interpretive aspect of the theory.
7. The moral aspect.
8. Criticism of Ricci's and Guillebaud's *presentation* of the view that savings is not double-taxed.
9. MacGregor's criticism of J. S. Mill and of Ricci does not seem well-founded.

CHAPTER XX

CO-OPERATIVE SOCIETIES AND THE INCOME TAX

Section I. *The economic effects of taxation of co-operative reserves*

1. In 1933 co-operative reserves were made liable to Income Tax.
2. As a result, co-operative societies will sell a smaller volume of goods than they otherwise would have done, at an unaltered price level. Some other cases mentioned.

Section II. *Is it just to tax co-operative reserves?*

3. The position of the societies in regard to income taxation before and after 1933.
4. The financial constitution of co-operative societies.
5. The societies appear to earn what is neither distinctly a surplus nor distinctly a profit. We will speak as if it were profits that they earned.
6. The society member occupies a position similar in some respects, but different in others, from that of the ordinary shareholder in a joint-stock company. We will speak as if the total profit of a society were definitely imputable to its members.
7. The Income Tax ought to be assessed on a person's income.
8. Using this principle, we calculate the maximum aggregate payment of Income Tax to which co-operators should have been liable in 1931-32. By doing so we find that this aggregate payment *before* moneys placed to reserve were made liable to tax, was already a little too great. Statistics are given showing the amount of additional tax to which the societies have been liable since 1933.
9. The argument of the Raeburn Committee and its grave defects.
10. Referring to a recommendation of the Royal Commission of 1920.

APPENDIX

1. Public works in a depression and the Income Tax.
2. If an income tax is progressive, a person whose income fluctuates pays a higher rate of taxation than that corresponding to his average size of income.
3. The severity of a progressive income tax increases when a rise occurs in the general price level.
4. Examples of calculation of liability to British Income Tax (1937-38).

I

THE OLDER THEORY OF THE INCIDENCE
OF A GENERAL INCOME TAX

CHAPTER I

INTRODUCTORY

FOR a considerable period it has been held by economists that the incidence of a general income tax is not shifted, and that such a tax has no tendency to raise or otherwise alter the prices of commodities. The most careful formulation of this theory, which, for convenience, I refer to as the older theory, can be found in the writings of Professor Seligman¹ and Mr. Coates;² and a view in some respects similar, was adopted by the Colwyn Committee on National Debt and Taxation which drew up its *Report* in 1927.

In December of 1927, however, a very important article by Mr. D. H. Robertson appeared,³ which made it plain that the arguments on which the economists had relied to show that the incidence of a general income tax is not shifted, were erroneous. The whole matter was seen to require further investigation.

The following chapters of Part I of this book outline the older theory of the incidence of a general income tax and go on to criticise this theory. When it has been made clear that the older theory is no longer

¹ E. R. A. Seligman, "Income Taxes and the Price Level", in his *Studies in Public Finance*, p. 59, and republished as Appendix XII, *Appendices to the Report of the (Colwyn) Committee on National Debt and Taxation*.

² W. H. Coates, "Memorandum on the Incidence of the Income Tax", Appendix XI in the same volume of appendices.

³ D. H. Robertson, "The Colwyn Committee, the Income Tax and the Price Level", *Economic Journal*, 1927.

tenable, instead of proceeding direct to a reconstruction of this theory we deal in Part II with the incidence of partial income taxes, *i.e.* taxes assessed on the earnings of particular lines of industry. These taxes are interesting and important in themselves; and an insight into their nature helps one to an understanding of the incidence of a general income tax.

In Part III the problem of the incidence of a general income tax is again taken up; to construct a theory of the incidence of a general income tax is the main object of this book. Part IV goes on to supplement Part III and deals with some related questions.

Any of the Parts I, II, III or IV can be read independently of the others. If the student's interest is mainly in the incidence of a general income tax, he may omit reading Part I or Part II; or better, he might read Chapter II and then pass on to Part III. Or, if he wishes to examine the incidence of partial income taxes, he can read Part II alone.

CHAPTER II

THE THREE ARGUMENTS OF THE OLDER THEORY OF THE INCIDENCE OF A GENERAL INCOME TAX¹

1. Down to 1927 it was generally held by economists that the incidence of a tax on income is not shifted but remains where it has been placed. Such a tax, they believed, leaves the prices of commodities and the rewards of the factors of production, at the same levels as it had found them. The only difference introduced into the situation by the tax, according to this theory, is that each person hands over a portion of his income to the Government for its uses, instead of using it on his own account.

The theory that the economists had put forward can be summarised as follows, in a way which shows the relationship between its different parts. There are three arguments in the theory :

- (i) An income tax which has been imposed, leaves each producer still a producer in the industry in which he had been to begin with.
- (ii) The number of firms in each industry remains constant.
- (iii) Each firm places the same quantity of goods on the market as it had done to begin with.

¹ The present chapter is much indebted to D. H. Robertson, *art. cit.*, *Economic Journal*, 1927; to Cabiati's "Per riempire alcune 'empty boxes' finanziarie", *Giornale degli Economisti*, 1928; and to Fubini's "Sull' influenza dell' imposta sulla domanda e sull' offerta", *Giornale degli Economisti*, 1929.

Hence, the theory concludes, the total supply of each commodity is unchanged by the tax. Therefore the price of each commodity is unchanged.

Let us state each of the arguments of this theory in turn; afterwards we go on to examine and criticise them.

(i) The first argument, as the economists who use it are careful to point out, only applies to the case of a general income tax, which is imposed on all branches of industry. When a general tax of this kind is imposed, it will not pay any industrialist to transfer his business from one branch of industry to another; because he could not escape the tax by doing so. Let us suppose that the entrepreneur's income in his present branch is R ; and that after payment of the income tax he is left with 80 per cent of R . Then 80 per cent of R will still be a greater net income than it is open to him to obtain in any other branch. He will, therefore, remain in the same branch as he had been initially. Thus the tax sets up no tendency to a transfer of resources between the different portions of the industrial field, but leaves each producer still a producer in that industry in which it had found him to begin with.

(ii) The Marginal Firm or No-Profits Firm argument is stated by Seligman as follows: ". . . the question [is] how the marginal producer, the producer at the margin, is affected. . . . A tax on income is a tax on net profits; and net profits are not cost, but the surplus over cost. A tax on profits cannot reach the man who makes no profits. But the man at the margin who makes no profits . . . pays no tax because he makes no profits. . . . If the man at the margin who at any particular time fixes the price

for the entire supply of commodities that is sold in the market pays no tax, how can the income tax be added to the price? The tax on profits is paid only by the man who makes profits, that is by the intra-marginal producer, not by the marginal producer. But the tax paid by the intra-marginal producer cannot affect the price which is fixed by the marginal producer who pays no tax.”¹

The skeleton of this argument would be :

Price is determined by the marginal or no-profits firm.

This firm makes no profits and therefore pays no income tax. Since *it* pays no income tax, *its* position is unaffected by the tax. Price, therefore, is unaffected by the tax.

That is, although a general income tax be imposed, it will leave the price structure unaffected.

(iii) The Marginal Unit argument of this theory completes the proof. In addition to there being a marginal or price-determining firm, these theorists hold, there is for each firm a marginal or price-determining unit of production. The marginal unit for any firm is the last unit of production that the firm is just induced and no more to place on the market. Sir Walter Layton states the argument briefly and effectively thus : if we consider any firm, “ production under competition continues up to that point where the last unit of output makes no contribution towards profit and therefore nothing towards the revenue of the State. This is the unit of production which determines prices, which should there-

¹ Seligman, *art. cit.*, *Appendices to the Colwyn Report*, p. 121.

fore be unaffected by a tax on those units which yield some profit. On the same reasoning, the amount of output should remain unchanged.”¹

The argument can be illustrated very simply by the curve of marginal costs MC in the diagram. If the firm is producing in a competitive market, the price of the commodity remains unchanged whether the firm increases or reduces its output: price therefore can be shown by a horizontal straight line.

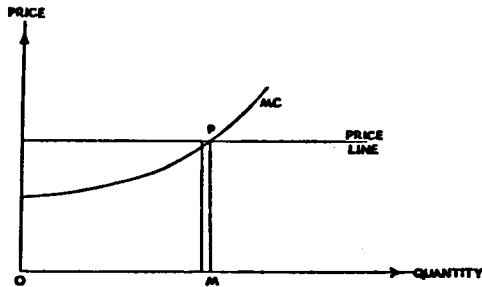


DIAGRAM I

The producer, it is known from economic theory, will in these circumstances continue production just up to the point at which marginal cost is equal to price, and no further. If he were to produce beyond M he would incur a loss on the extra units that he produced: if he were to produce less than OM units he would forgo a gain on the units he had refrained from producing. The OMth unit which he produces, fetches a return shown by the area of the very thin rectangle in the diagram: and the cost of production of this unit is given by the same area. This unit just covers its cost of production and no more. It yields the producer no profit over and above its cost

¹ *Minutes of Evidence taken before the (Colwyn) Committee on National Debt and Taxation, p. 177, § 11.*

of production. The producer makes no payment of income tax on account of this unit, since he makes no profit from it. Hence the production of this unit is left unaffected by the income tax; the OMth unit will continue to be produced after the tax as it had been before it. But if the OMth unit is produced, the firm's output must be unchanged, because the firm had initially produced OM units of output.

Thus the economic theory which we outline, seeks to establish that when a general income tax is imposed, there will be no interchange of resources between the different branches of industry, that the number of firms in each branch will remain unchanged, and that the output of each one of these firms will likewise be unchanged. If the logic of these arguments be correct, then the theory holds itself to have established that commodity and factorial prices will be left unaltered by the tax. But are the arguments of the theory valid? That is what we must discuss.

2. (i) The first argument of the theory we are describing affirms that since the whole of the economic field is taxed, each manufacturer will continue in the same line of production as before. An assumption underlying this argument is that the gross income of each person in the new situation, *i.e.* his income before he pays the income tax, remains the same as it had been initially. Let us, to begin with, grant this assumption.

Even then the conclusion which the argument purports to arrive at will not follow. There will still be some transference of resources from one part of the field to another. One requirement which must be fulfilled in order that a condition of equilibrium should exist, is that the "net advantages" offered to a person by his occupation, should be the highest

on his scale of preferences which it is open to him to attain, when not only the monetary reward of the occupation but also the social esteem, leisure, etc., attaching to it are counted among its net advantages. The income tax reduces only one form of the net advantages of different occupations, the monetary advantage. Consequently, a person who was formerly hovering in choice between two occupations, one whose net advantages are largely monetary and another whose advantages are largely non-monetary, and so not taxed, may now tend to favour more strongly the class of occupation affording its net advantages more largely in the non-monetary form. Or even, as can be shown,¹ it is possible that the individual will, in these circumstances, be brought by the income tax, from a state of indifference in choice, to a decision favouring the occupation which will afford him the larger monetary income. Again, a person of certain psychological tastes may be led to retire earlier from business as a result of an income tax which swallows up part of his earnings: the effort may then seem to him not worth while. Yet the same tax may induce another man to extend his business life over a longer period, until he makes that accumulation of capital on which he has set his mind.

Changes and shifts of economic resources we know that there will be, even though we were to grant the assumption that the gross earnings of the factors of production would be left unaffected by the tax. The direction of the changes we do not here need to inquire into: it is sufficient for our purpose to establish the fact of change. Thus, even granting the assumption most favourable to it, the contention of the first

¹ See Chapter XII *infra*.

argument of the older economic theory of the income tax would not be true.

A more obvious set of causes exists, which makes the event differ still further from what this argument contends it would be. If we look at the matter from the side of demand, those taxpayers who have handed over a portion of their income to the Government are now in possession of a smaller sum of money to spread over their saving and consumption. For this reason their demands for consumption goods, and also for production or capital goods, will undergo alteration. Moreover, the Government of the country has now come into possession of a larger spending power; the goods which are dominantly consumed by the Government will be in greater demand. Corresponding to this altered structure of demand in the community, there will be a transference of resources between different branches of industry. As a result of this, an intricate system of changes in the rewards of the factors of production will take place — the very thing that had been assumed away by the first argument of the older theory.

Thus we see that the first argument of the theory which we are examining, must be regarded as erroneous: the conclusions it drew did not follow from the premises; and the premises themselves had been unsuited to discussion of the case.

(ii) The argument of the older theory which relates to the no-profits firm also appears to be very defective. It collects together into itself a number of mistaken ideas. The marginal firm of economic theory is not, as this argument alleges, a no-profits firm. The marginal firm is, it is true, a firm which is just undecided as to whether or not it should continue in its present line of production: a slight increase in

the favourable factors would determine it to continue, and a slight diminution, to cease production. The profits of the firm at the moment, and in the short run, however, are by no means decisive in determining whether or not a firm is at the margin. The marginal firm may, at the moment or in the short run, be earning no profits ; but it may also be a firm which is earning large profits ; or perhaps even large negative profits, that is, be making a considerable loss. The case last mentioned might, for example, occur where a firm was newly established and expecting for some time yet to suffer losses, as part of a process of building up a business connection. Only, in this case the firm would look forward to a period in the future at which it expected to recoup these losses out of profits, once it had become fully established. Indeed, when the upholders of the argument that we examine pointed to one set of firms, and held that because at the moment their profits or their losses were of a certain amount, therefore such and such was the case — when they did this they were running counter to a fundamental tenet of economic theory, namely, that the facts of the past, even of the immediate past, do not in themselves matter (“ bygones are forever bygones ”): they have no significance except in so far as they are a guide to future expectations. It is in terms of expectations that our theory should reason.

The position of false eminence to which, in some writings, the no-profits firm had been raised, grew out of a misunderstanding of Marshallian doctrine ; and it was a misunderstanding which at the time was very widespread. Marshall, however, had never depicted the marginal firm as being the no-profits firm. He had intended his doctrine of the margin, when used to

trace price and production changes through time, to be taken in conjunction with his doctrine of the "representative firm", a conception totally different from that of the no-profits firm. "Our representative firm", he said, "must be one which has had a fairly long life, and fair success, which is managed with normal ability, and which has normal access to the economies, external and internal, which belong to that aggregate volume of production; account being taken of the class of goods produced, the conditions of marketing them and the economic environment generally."¹ The representative firm would cover, among other costs, "interest and insurance on all the capital", and "the gross earnings of management (including insurance against loss), of those who undertake the risks, who engineer and superintend the working".²

Marshall would have disliked saying that the margin determines price: he always considered the margin as being itself determined by the forces of demand and supply, and as altering when either of these altered.³

He was, again, much more concerned with the economics of the long period than of the short period, and had in view chiefly the ultimate results of economic forces. It may be conjectured that if he

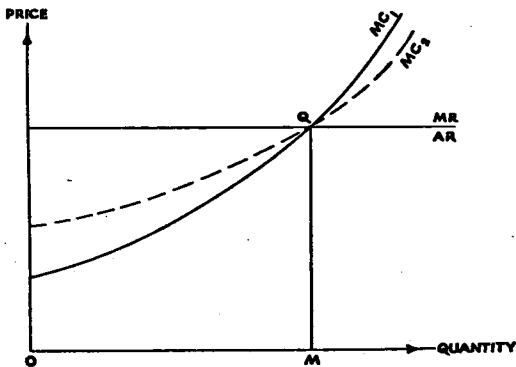
¹ Marshall, *Principles of Economics*, p. 317; and Robertson, *art. cit.* p. 568.

² *Principles*, p. 343. The point is well illustrated by his discussion of a tax on printing presses, *ibid.* p. 415. An explanation of the nature of the representative firm and its place in Marshallian doctrine can be found in the following: Robertson, *art. cit.*, *Economic Journal*, 1927; Robertson, Shove and Sraffa, "Increasing Returns, and the Representative Firm: a Symposium", *Economic Journal*, 1930; Robbins, "The Representative Firm", *Economic Journal*, 1928; and Davenport, *The Economics of Alfred Marshall*, p. 359 f.

³ *Principles*, p. 410. Contrast with this attitude the statements of Seligman and Layton quoted.

had been dealing with the problem of the income tax he would have considered long-period influences, certainly from the side of costs, and, less certainly, from the side of demand: among long-period costs he would have included "interest and insurance on all capital and the gross earnings of management". Once he had discovered what long-period effects were going to be, short-period effects could have been handled with more firmness, being the first steps from the initial position towards that of the long period. The writers whom we are considering, on the other hand, showed little or no concern for the long-period.

(iii) The third argument, that of the marginal unit, gives a correct definition of what is meant by the marginal unit. This argument could be stated in its correct form as follows: if demand remains unchanged (*i.e.* all demand curves in the system remain unchanged), and if all factorial prices remain unchanged, then the unit of output which had been the marginal unit before the tax will continue to be the marginal unit after the tax has been imposed. Let us illustrate and prove that this is so by means of a diagram:



We draw MC_1 , the curve of marginal costs for a firm selling its commodity in a competitive market; the average and marginal revenue for the firm will be the horizontal coincident lines AR and MR in the diagram. If there were no tax, the OMth unit, corresponding to the point of intersection of MC_1 and MR, would be the marginal unit: for this unit, marginal revenue and marginal cost to the firm are equal. The firm's output, were there no tax, would be OM.

After the tax the new curve of marginal costs must be of the shape MC_2 shown: because the income tax absorbs a portion of the profit from each unit of output sold. On the OMth unit of output sold there is no profit. Hence the new curve of marginal costs, MC_2 , still cuts the curve of marginal revenue in the point Q, corresponding to the output OM. The firm, therefore, will still market OM units as before.

An hypothesis on which this conclusion depends is that the supply curve of each factor of production remains unaltered in shape. This is equivalent to supposing that, despite the tax, the factors are willing to accept the same gross rewards as before for the same services as before, even though they have now to pay to the Government out of these gross rewards certain sums by way of income tax. An assumption of this kind is very far-reaching indeed. But, and here is the point, so far as practical application of the argument is concerned, there is no reason to believe that in actual life the supply curves of the factors of production remain unaltered in shape when a change in the height of the tax takes place. Indeed, as we go on to show, there is reason to believe the contrary. Let us suppose that a general income tax

has been imposed. It is then no solution of the problem to state what would have happened had it been the case that the supply curves of the factors had remained unaltered, when in fact (as we show later) they will have altered. What the solution of the problem does require is that we should find out the changes in the shapes of the supply curves of the factors of production which accompany a given alteration in the tax. From the side of supply *the shape of the curve of marginal costs to a firm is a function of the height of the tax. It will alter in a determinate way when the tax alters.*

So also from the side of demand: *the shape of the curve of marginal revenue of a firm is a function of the height of the tax.*

What the argument that we have examined proves — and it is in this third argument that the kernel of truth of the older theory is to be found — is, that if we know the shape of the curves of average and marginal revenue for a firm in the new situation, and also the shape of its curves of cost-excluding-tax, in the new situation, we already know, without taking the tax into further account, what price and output for the firm will be (and since for each firm, hence also for the industry). *The influence of the income tax on the situation is already sufficiently taken into account when we have determined the alteration that it induces in the shape of the demand curves and curves of cost-excluding-tax. This theorem must be borne in mind by the reader throughout the whole of the subsequent discussion.*

The truth of this theorem can be seen by reference to diagram III. Suppose that, for any firm, after the tax has been imposed, the curve of marginal

revenue and curve of marginal cost, when cost is reckoned so as to exclude income tax, are MR and MC respectively. The diagram again presupposes perfect competition in the industry, the curve MR being shown as a horizontal straight line. An output of ON units equates marginal revenue to marginal cost, if we disregard the tax.

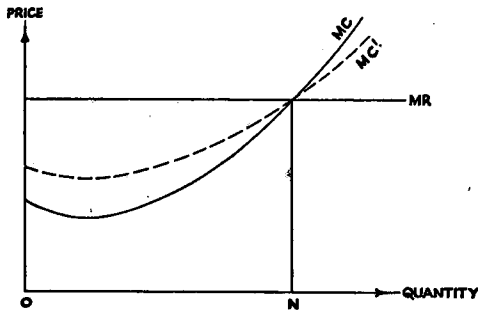


DIAGRAM III

When the income tax which has been imposed is taken into account the new curve of marginal cost to the firm, when cost is reckoned so as to include the tax payment, becomes MC^1 . The tax absorbs a portion of the profit from each unit of output sold, so that the shape of the curve is as shown. The ONth unit of output yields no profit; and the curves MC, MC^1 therefore coincide at a point corresponding to an output of ON units. And an output of ON units still equates marginal revenue for the firm to its marginal cost, when the tax is taken into account in its cost reckoning. Hence if, in the following pages, we can find the influence which a general income tax exerts on the shape of the marginal revenue and marginal cost curves for the different lines of industry, this will

be sufficient to determine the effects produced by the tax on prices and outputs. No *additional allowance* need be made for the part played in costs by the general income tax itself. The tax only affects price and output implicitly, by causing an alteration in the shapes of the curves of revenue and of cost-excluding-tax.

CHAPTER III

MR. COATES'S THEORY AND STATISTICAL INVESTIGATION

1. THE most thorough-going attempt to show that the incidence of the income tax is not shifted in the form of a rise in price, is that of Mr. W. H. Coates.¹ Because his view is contrary to the one which we go on to express, and also because he attempts a statistical, as well as a theoretical investigation, his treatment of the problem appears to be particularly worthy of examination. The examination will, I think, help us to understand the limitations attaching to a direct statistical approach to the question.

The statistical investigation made by Coates was one of the greatest thoroughness. It was carried out by him while he was Director of Statistics and Intelligence in the Inland Revenue Department. Over a quarter of a million trading accounts had been voluntarily furnished to the Department by firms: of these Coates made an investigation by sample; the breadth and completeness of his statistical inquiry has deservedly received praise from all who have considered it.

Coates's theory is a variant of the "theory of three

¹ W. H. Coates, "Memorandum on the Incidence of the Income Tax", *Appendices to the Report of the (Colwyn) Committee on National Debt and Taxation*, Appendix XI. Coates's Memorandum is examined by Robertson, *art. cit.*, and by Einaudi, "Per una ricerca sulla traslazione dell' imposta di ricchezza mobile ed in ulteriore critica del progetto Rignano", *Riforma Sociale*, 1927.

arguments" which we have just examined; and it contains the fallacies of that theory. One of the essential weaknesses of this type of theory is that although it has set out to trace price changes through time, its whole technique is unsuited to the purpose: and this becomes very clear in the present Memorandum. The inquiry must concern itself essentially, he says, with the short period; and for him the short period is very short indeed, sometimes concerning merely "the facts of the moment".¹ If it were merely the moment with which we were concerned, price could not change: and later on we will see that — if we exclude alteration in demand conditions — the shorter the period of time chosen, the smaller is the price change within it likely to be.

Coates attacked the business men, in particular Mr. P. D. Leake, for considering, in their theorising, what would take place in the "long run". But their procedure had at any rate a certain amount of reason behind it, inasmuch as each lapse of a short period of time can be regarded, if progress is made by an even process — an important proviso — as an additional step from the initial point towards the long-period result. A theory of the long period will, in these circumstances, tell us something valuable about the short period. (The theory of the short period is, of course, important also: and it would be of most service if developed in conjunction with the theory of the trade cycle — not an easy matter at the present day, and much less so at the time when Mr. Coates was writing.)

2. As a result, probably, of the weakness in his treatment of the time factor to which we have alluded,

¹ "Memorandum", § 7 and § 36.

Coates's theory is specially unsatisfactory when dealing with savings, interest and capital. He points out that the bulk of the community's savings is made by the rich and that the volume of their saving is cut down when the income tax is raised. Whether or not this will cause a rise in the rate of interest will depend on the use which is made of the additional yield of the tax. "In sum", he concludes, "it is probable that the rate of Income Tax has a consequential effect upon the rate of interest." He excuses himself from a consideration of the effects of a rise in the rate of interest, however, by saying that "As the number of steps in the causative chain between rate of tax and rate of interest increases, so do the possibilities of disentangling the effect of the tax from that of numerous other intervening forces become more remote".¹ This is a line of theorising on which the position taken up by Coates is quite unsatisfactory, but which ought to fit harmoniously into a completed theory.

3. Once he has decided to concentrate his attention on what happens during the short period, it would be most natural for Coates to regard the larger possibilities of variation as coming from the side of demand: because the shorter the period of time the more nearly fixed will be the cost factors in production. As he himself puts it, "Demand price is a creature of the moment. Supply price, on the other hand, is the present effect of numerous forces set in motion in the past."²

Let us place in relation to this strand of Mr. Coates's argument, another, which relates to the use which the Government makes of the money that it has

¹ *Ibid.* § 54.

² *Ibid.* § 6.

collected in taxation. Here, obviously, is a case where demand conditions which are comparatively easy of short-period treatment, can be taken into account. What is Coates's position here? When the tax is levied on the profits of a firm, he says, "As for demand, it is often hastily supposed that the purchasing power taken by taxation simply disappears into the void. The national balance sheet makes it clear, however, that all the revenue collected is disbursed again."¹ When the Government collects the money from a firm and then spends it, the whole process, he points out, is just the same as if the number of shareholders in the firm had been increased. At this point he has drawn a demand and supply diagram and holds that "Certainly no change in the various forces resulting in the equilibrium of price indicated by the diagram would be anticipated from an increase in the number of shareholders in the companies concerned."² Yet surely Coates's theory is here essentially in contradiction with itself. If the number of "shareholders" in the companies has been increased, the scales of preferences of the new shareholders will be different from those of the former shareholders; and so their money expenditure will be distributed over the various goods, in a different way from formerly. Alterations in the demand curves for the various commodities will take place even in the short period. Price changes ought, therefore, to be expected. But on Coates's view the income tax leaves prices unaffected.

4. Mr. Coates's general approach to the problem is, first, to repeat the arguments of each of the two opposing groups who had expressed views on the

¹ *Ibid.* § 37.

² *Ibid.* § 37.

matter ; that of the group of economists to which he himself belongs, who held that the incidence of the income tax is not shifted, and that of the group of business men who stated that their opinion was that the income tax had repercussions causing prices to rise. He then states that he believes that the correctness of the arguments of the two groups can be tested by a statistical examination of the profit situation in firms, at different dates in time. To do this he chose as statistical variable the percentage of profit per unit of output earned by a firm. The significance of this variable is that if the average size of the variable increases (falls), at one date as compared, with an earlier date, then we know that at the later date the manufacturer is charging more (less) per unit of service at the later date, than at the earlier.¹ The periods of time over which the variable was examined, were the income tax years 1920-21, 1922-23 and 1912-13. The examination covered each of the seven industrial groups : Cotton, Wool, Iron and Steel, Metals, Food, Wholesale Distribution and Retail Distribution.

Mr. Coates states that the issue between the two schools, the economists and the business men, is "largely a question of fact. Are the industries of the country mainly in the hands of representative concerns, whose normal cost of production determines price, as the business school contends, or, on the contrary, are they in the hands of concerns whose varying circumstances and abilities show, in competitive conditions, results varying from losses, or small profits, up to large profits, per unit of business ?" ²

¹ *Colwyn Min. of Ev. Questions* 8961-3.

² "Memorandum", § 17.

This appears to Coates to be the crucial issue. The form which the issue has for his mind can be stated thus. Is the dispersion of the variable small and its frequency curve of the type A shown in the diagram? If so, he will conclude that business is for

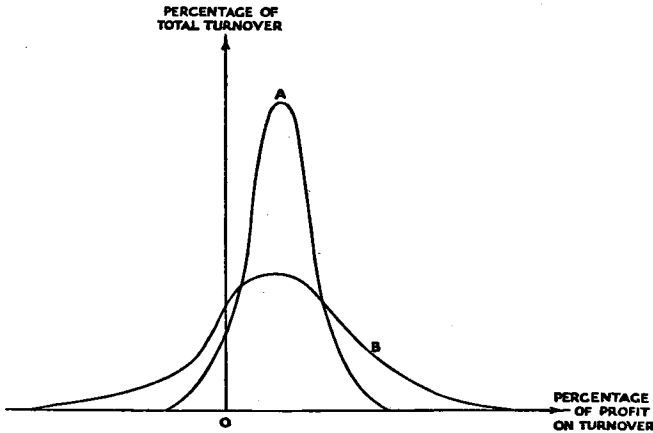


DIAGRAM I

the most part in the hands of representative concerns, all of about the same standard of efficiency, and that the view of the business men is correct. If, on the contrary, the dispersion of the variable is large and its frequency curve of type B, then he will conclude that the financial circumstances of firms in each industry vary very widely, and that the view of the income tax held by economists (that its incidence is not shifted) is correct. Why he thinks the problem can be resolved to this form, Mr. Coates does not explain. Let us for the moment pass over this difficulty.

In fact the dispersion of the variable turns out to be very large for each of the industrial groups

examined,¹ and the frequency curve of type B.² By analysing the statistics relating to the pre-war period, he showed that this wide dispersion of the variable was not a phenomenon confined to the post-war period alone, though by this time it had become greater. The essential features of the statistics for both the pre-war and post-war periods are contained in the following table.

PROFIT AS A PERCENTAGE OF TURNOVER³
(Aggregate of Seven Industrial Groups)

	1912-13	1922-23
Median	4.61	4.11
Mean deviation from median	3.59	6.01
Lower quartile	2.53	1.24
Upper quartile	7.67	8.46

Since the frequency curve is of type B, Coates is led to conclude that the ideas of the business men were mistaken, and those of the economists correct.

He uses these statistics further, to break down the contention of the business men. In 1912-13, he points out, the standard rate of income tax was 1s. 2d.; in 1922-23, 5s. in the £. In 1912-13 the net rate of profit on turnover, therefore, was $226/240 \times 4.61$ per cent = 4.34 per cent. If it were this net rate which had to be maintained, then the gross rate of profits would have required to have risen in 1922-23 so as to be sufficiently large to yield a net rate of 4.34 per cent. Suppose the gross rate

¹ Except the curve for Retail Trade which shows a tendency to become of type A. For the quarter ending March 1923 its median percentage of profit on turnover is 5.45 per cent, and the mean deviation from the median 2.72 per cent.

² "Memorandum", p. 92, graphs I and II.

³ *Ibid.* § 39.

of profit in 1922-23 had been Z. This would have meant that $180/240 Z = 4.34$ per cent, giving $Z = 5.79$ per cent. But the gross rate of profit had not in fact shown an increase of the order of 1.2 per cent. This, Mr. Coates says, affords further evidence of the wrongness of the business view.¹

On the other hand, the statistics, in Mr. Coates's opinion, afforded positive evidence in favour of the correctness of the economic theory which he had expounded: because, "even in the most profitable period here analysed . . . there is evidence that in practically all groups some part of the total turnover was sold at a loss. . . . The existence of marginal concerns is clearly indicated."²

5. Although the technique which he displays in analysing the statistical material is most admirable, Coates's interpretation of the statistics is open to a number of criticisms. He states that the issue between the two views he is examining, can be resolved into the question of whether the shape of the frequency curve of profits is of type A or of type B. But he in no way attempts to substantiate this statement, the truth of which appears to be more than doubtful.

Here, indeed, Mr. Coates has got himself into an awkward dilemma. Either, in the statement that we have quoted, he is using the term representative firm in a non-Marshallian sense; and to modify the existing terminology in this way without explicit warning would be bad and confusing. Or else he is using the term in a Marshallian sense; in which case what he says would seem to imply that Marshall would have held that the incidence of the income tax

¹ *Ibid.* § 44.

² *Ibid.* § 27.

is shifted — but in the absence of any pronouncement on the subject by Marshall himself this must remain mere assumption. (It is even possible, so to speak, that Mr. Coates is caught on both horns of the dilemma at once: that he uses the term in a non-Marshallian sense, though believing the sense to be that of Marshall. There is some evidence for this view.)

Coates expresses the view that representative concerns are “concerns equipped with appliances and ability, more or less on the same level”.¹ When he has completed his statistical investigation he neglects to state definitely whether he concludes that the representative firm does or does not exist. But since he states that the dominant feature of the statistics is the magnitude of the dispersion of the variable, we may safely infer that he regards the representative firm as having no real existence. Einaudi, who, like Coates, upheld the marginal firm argument, was quite definite on the matter: he referred to the investigation as being “the first to show to us the non-existence of the representative firm”.² Mr. Keynes, with Coates's evidence before him, expressed the view that the magnitude of the dispersion “is so considerable as to do some damage to the conception of the Representative Firm”.³ Robertson, however, believed that the shape of the frequency curve obtained “would not greatly have surprised Marshall”.⁴ Robbins in his discussion of the concept the representative firm, pointed out, in agreement with the position of Robertson, that while the representative firm is in some sense an average

¹ *Ibid.* Annexe II, § 3.

² *Art. cit.*, *Riforma Sociale*, 1927, p. 272.

³ *Economic Journal*, 1927, p. 205.

⁴ *Art. cit.*, *Economic Journal*, 1927, p. 571.

firm, the average is not one which can be directly apprehended from the statistics of an existing situation. "It is *an average which would only emerge arithmetically under conditions when all present tendencies to change had reached a state of equilibrium.*"¹ From the discussion of Robertson, Robbins and Davenport it appears that Mr. Coates had misunderstood the nature of the Marshallian doctrine of the representative firm. Nor can it be said that the issue between the two schools of thought on the income tax, the economists and the business men, boils down to a question of fact, that of whether the dispersion of the profit variable be large or small. The theoretical foundation of Mr. Coates's work crumbles and his statistics can throw but little light on the problem at issue.

Again, in the arithmetical example of Coates's which we have quoted, he seeks to discredit the argument of the business men on the score that their argument would only have been true had it been the case that the rate of profit on turnover had increased by roughly $1\frac{1}{2}$ per cent between 1912 and 1922. Yet if it had been logical for him to use the figures in this way, it would have been logical to have made still further use of them: the figures would have been equally capable of showing that the rise in the income tax which had taken place between the two dates had in fact caused a fall in the rate of profits, so that business men were now content to accept a smaller gross share of profit per unit of turnover than they had been formerly. Though Coates stopped short of

¹ *Art. cit.*, *Economic Journal*, 1928, p. 390. Robbins's italics. See also Davenport, Robertson and Shove, *loc. cit.* on p. 13 above. Coates's "Memorandum" did much to stimulate the important discussion on the theory of costs which took place about this time.

this use of the statistics, the use that he did make of them was no more logical.

A more obvious interpretation of the statistics was given by Sir Alan Anderson.¹ He pointed out that 1922 as compared with 1912 was a year of very bad trade. "What you have proved is that the net return per unit with a heavy Income Tax in that very bad year was the same as the net return per unit without the same Income Tax in a normal good year."²

The interpretation of the statistics suggested by Sir Alan is simple and unforced. He uses in support of the view of the business men, the same set of statistics as Mr. Coates had used to discredit it. This illustrates the dangers which beset economists when they are dealing with a complicated piece of theory involving a number of variables, and they have to place reliance on the evidence of statistical series.

¹ See the summary of the statistics that we have given in the table on p. 25 *supra*.

² *Colwyn Min. of Ev.* Question 9386.

CHAPTER IV

TWO MAIN SOURCES OF AN IMPROVED DOCTRINE : THE COLWYN REPORT AND DE VITI DE MARCO'S *FIRST PRINCIPLES*

SECTION I

The "Colwyn Report" (1927)

1. AN appreciable portion of the *Colwyn Report* is devoted to sustained and difficult reasoning investigating the economic reactions produced by an income tax. In the course of this some improvements are introduced, which must be retained in any analysis which is made subsequently. At the outset of its treatment, however, the *Report* commits an error; and, rather ungenerously perhaps, we will give attention to begin with to the two main deficiencies of the *Report*, only referring to its important positive achievements later.

A cardinal point in the Committee's treatment of the problem is the meaning it gives to the words, incidence and effects of taxation. The Committee defines its use of the terms in the following passage :

" We may now pass to a discussion of the incidence and effects of the several existing taxes. By way of preface, we may explain the meaning which we think it convenient to attach to the term ' incidence of taxation '. In general usage the term covers not only the initial burden of a tax, but also the whole range of consequential effects. Economists, however, have

given it a narrower meaning. For them 'incidence' is only concerned with the question on whom the more immediate burden of the tax as a tax rests. This is the first thing to be decided about any tax. It is to be distinguished from the question of further effects, which may be exceedingly important. For instance, the burden of a tax may rest upon an employer, and in consequence he may cut down his staff; in such a case the effects of the tax may be more serious to the employees than to anyone else, but the incidence of the tax is not said to be upon them.

"For the purpose of analysis we think it useful to follow the economists in using the term incidence of taxation in this narrow sense, distinguishing it sharply from the further effects of taxation, and dealing separately with the latter."¹

Now unfortunately the deficiencies of this vital passage of the *Report* are numerous and deep. The suggestion of the phrase that incidence has regard to "the more immediate burden of the tax", is that the Committee is going to refer to the consequences produced by the tax in the short period as being its incidence, consequences produced in a longer period as being part of its effects. And this, it is true, is roughly what the Committee has in mind.

But if so, the sentence which holds that if a tax which is imposed on an employer causes him (in the short period?) to dismiss some of his workpeople, then the reduction in the number of his workpeople is not part of the incidence of the tax, becomes not merely confusing, but wrong. It introduces a distinction other than that of time, a distinction which

¹ *Report of the (Colwyn) Committee on National Debt and Taxation*, p. 106.

appears to depend on whether the person concerned is, or is not, himself liable to payment of the tax. Such further explanations as the *Report* gives, leave the position still obscure.

The Committee, we take it, means by its definition, that the incidence of a tax refers to the price and other economic consequences brought about by the tax after the lapse of a short period of time. But, in fact, the incidence of a tax has not been taken by economists, as the Committee alleges, to refer to its short-period consequences. The classical school of economists meant by incidence, the economic consequences produced by the tax after the lapse of the *long* period; while Marshall and Edgeworth used a time analysis, in which incidence referred to effects produced by the tax either after the long period of time, or after a short period of any given length.¹

That the *Report* should err on a point in the history of economic doctrine, is in itself quite unimportant. The difficulty is, that when it makes the error, the Committee says it is going to use the word incidence in its usual meaning; but it really is going to use it in an unusual and abnormal meaning; and this goes a long way to mislead students of the *Report*. If, as many of them probably do, they attribute to incidence the meaning it has in the writings of the classical economists, they draw entirely wrong conclusions about the Committee's findings. Thus the meaning given to incidence in the *Report* has created a great deal of misunderstanding.

For the sake of clearness we will express the Committee's meaning as we have given it above (that incidence refers to short-period, and effects to longer-

¹ Cf. *infra*, Chapter IX, § 4.

period, results of a tax), in the alternative non-Marshallian fashion, which speaks not of periods of time but of supplies of the factors of production. We can then say that *when factorial supplies are taken to be fixed, the Committee is going to refer to the economic consequences of the income tax as its Incidence. When factorial supplies are taken to be variable, the consequences of the tax will be referred to as its Effects.*¹

We are now clear as to the meaning that the Committee is going to give to the words Incidence and Effects. We have criticised the Committee's definition of Incidence on the ground of obscurity, that it departs from traditional usage, and that it will mislead readers: but, and this is important, these criticisms have been levelled against the use to which the word Incidence has been put; the meaning of Effects we consider to be quite plain.

In fact, and apart from the nicer points in definition, does the meaning which the Committee gives to Incidence greatly reduce the value of the *Report* as an economic document? The first feature to be noticed is that whereas fifty pages are devoted to treatment of the Effects of the income tax, only ten pages are given to a discussion of the Incidence of the tax: so that the value of only a small portion of the *Report* is called in question by us.

We should regard detailed criticism of so small a portion of a valuable *Report* as being niggling and unnecessary, were it not that we believe that readers can only benefit from the *Report's* treatment of the income tax, after they have clearly realised the defects

¹ For the remainder of this chapter when the words Incidence and Effects are used in the meaning of the Colwyn Committee, they are printed with capital letters.

of the initial portion which deals with Incidence ; and since they would, we believe, be unlikely to discover these defects for themselves after even two or three perusals of it, we will point them out in some detail.

2. The section on the Incidence of the income tax opens thus :

“ The question of Incidence is of special practical moment in the case of the Income Tax. There are two current views ; according to one a general Income Tax cannot be shifted by the person on whom it is laid, while according to the other it can be shifted, and is in fact shifted, in the form of an addition to price.

“ If and so far as the latter view is correct, the Income Tax must abandon part of its chief claim to virtue as a method of taxation. However carefully graduated, it can no longer be said to satisfy the canon of ability to pay, if the burden is indiscriminately shifted : if this happens, no one can tell how much tax he really suffers. This implication is usually not developed by those who advocate the view that Income Tax is added to price. They more often pursue the argument that Income Tax is responsible for raising prices, and is therefore a potent factor in depressing trade.”¹

It admits of little or no doubt, however (in the view of the present author), that the Incidence of the income tax in the sense in which Incidence is defined by the Comité, has very little “ practical moment ”. We are to rule out while discussing it — if the above view of the Committee’s definition be correct — any changes which take place in the supply schedules of the factors of production. We are also, it will be found by

¹ *Report*, p. 108.

reading this section, to rule out any changes taking place in the demand curves for commodities.¹ And Incidence in this sense of the word is not very important.

After the passage from the *Report* which we have just quoted, the Committee goes on to criticise the opinion held by business men that the income tax leads to an increase in the prices of commodities. As against the contention of the business men, the Committee shows that the Incidence of the tax cannot be shifted. But is this legitimate? The business men were considering the influence of the tax on prices over a period of time of a number of years — they were considering, that is, the question of real practical importance — and to show as against them, that the Incidence of the tax is not shifted, is to attempt to refute them by disproving something they had never believed.

The difficulties of reading and seeing clearly the drift of this section of the *Report*, have perhaps been sufficiently indicated by now. At one point in it the Committee comes very near to defining Incidence in the way in which, we have suggested above, it really intends to use the word. It supposes that there are three dealers, each selling the same commodity, and after describing the individual circumstances of each, says: "Let it also be assumed that, apart from the raising of the Income Tax, the conditions affecting supply and demand remain the same".² And it proceeds to show that the Incidence of the tax on the dealers cannot be shifted.

The section on Incidence reaches the conclusion

¹ If this were not the case, the Committee could not possibly arrive at the conclusion it does, that the Incidence of an income tax is not shifted.

² *Report*, p. 115. See also p. 116.

that "the broad economic argument is true over practically the whole field and for practically the whole of the time, any exceptions being local or temporary and insufficient to invalidate it".¹

The "broad economic argument", however, is not designed by those who use it, *e.g.* Seligman and Coates, to apply only to the very short period of time after the tax has been imposed, to which alone this section of the *Report* should refer. It has reference to a wider context than this; and its holders believe it enables them to show that the "incidence" of an income tax is not shifted either in the short or in the long period. But this section of the *Report* should have no reference to the long period of time at all: it should be regarded as covering no cases other than those in which "apart from the increase of the Income Tax, conditions affecting supply and demand remain unaltered". Coates and Seligman spoke in a context much more general than this and of much greater practical importance. Truly the definition of Incidence adopted by the *Report* has raised a hornets' nest of troubles.

3. The other feature of the *Report* which may give rise to difficulty, is its treatment of the financial resources that the income tax yields to the Government. The committee feels the importance of this aspect of the problem and alludes to it, rather uncomfortably, on a number of occasions.

"In particular," it says at one place, "so far as it is applied in payment of pensions, unemployment relief, etc., it [the Income Tax] supports the purchasing power of the worker and increases the total effective demand for necessaries."²

¹ *Ibid.* p. 119.

² *Ibid.* p. 165.

Again: "Especially in the lower ranges of liability [to the Income Tax], the individual and his family may benefit directly from the expenditure on health, pensions, education, etc." ¹

And in another place: "The Income Tax clearly levels down the higher incomes, although there is a counteracting movement so far as it is applied in payment of debt interest. Thus, to this extent, it redistributes saving power in favour of the moderate and lower incomes." ²

But it fails to give any systematic account of the expenditure of the tax proceeds in its theory of Incidence or of Effects. Had the Committee been more fully aware of this aspect of the situation, changing demand schedules, it would not have arrived at the conclusions which it did eventually reach. The Incidence of the income tax is not shifted, it concluded, meaning by this that in the very short period the supply schedules of commodities remain unaffected by the tax. But manifestly, even though this should be so, in the very short period the demand schedules for commodities will be altered, and some price reactions will follow. Likewise had the Committee's treatment of the expenditure of the tax revenues been correct, its analysis and conclusions in regard to the Effects produced by the tax over the longer period would have been different.

4. By far the longer part of the *Report* relating to the income tax is the section on "The Effects of the Income Tax", with which it would be difficult to disagree. It traces the effects of the income tax over a period of time on the saving of the individual and its quality (*e.g.* whether the individual becomes less

¹ *Ibid.* p. 128.

² *Ibid.* p. 141.

or more willing to undertake industrial risks in his investment); and whether he will be likely to extend or curtail his output of personal effort as a result of the tax. The effect of the tax on the savings made by joint-stock companies, *i.e.* on company reserves, receives detailed consideration; as does its effect on the willingness of these companies to bear risks.

The Committee also took account of an aspect that is not mentioned at all in this book (which deals only with a closed economic system)—the influence of the tax in causing individuals to live abroad, or companies, public or private, to transfer their headquarters abroad in order to avoid liability to the British Income Tax. In this inquiry the Committee was assisted by figures supplied by the Board of Inland Revenue which showed that transfers abroad down to the date at which the inquiry was made (1924), had been on a relatively small scale.¹ The main factor causing companies to transfer their headquarters abroad appeared to be not so much the height of the British Income Tax, as the occurrence of double taxation by the British Income Tax and the income tax of a foreign country in the case of shareholders resident abroad. The high rates of income tax in most foreign countries after 1918 would be a sufficient deterrent to prevent any appreciable movement of individuals abroad. It is possible, however, that the removal of companies abroad may have become more important since the date when the Board of Inland Revenue presented this report. No later figures have been published on the topic.

Its conclusion in regard to the "Effects produced

¹ *Appendices to the Report of the (Colwyn) Committee on National Debt and Taxation, Appendix No. XVII.*

by the Income Tax" the Committee states thus :

" We have seen that, with unimportant exceptions, the Income Tax is not passed directly into the price of goods and services. Whether prices are indirectly affected is another question, depending on the total effect of the tax on saving and enterprise. Saving and enterprise are undoubtedly diminished to some extent. . . . So far as the Income Tax, operating in these ways, has any tendency to reduce the volume of production, it must also have a tendency to increase prices. . . . It appears to us that over the whole field its influence on prices has been of little relative importance."¹

SECTION II

De Viti de Marco : " First Principles of Public Finance " (1928)

5. De Viti introduced one or two most significant improvements into the theory of incidence. In a celebrated passage he points out that effects produced from the side of demand must be taken into account.

" The current theory [of incidence] ", he says, " rests on two traditional errors of classical economics.

" The first of these is the practice of considering the problems of Public Finance as if they were completely independent of the phenomena of Private Economics. As a result, no attempt is made to see what happens to the tax once it has left the budget of the taxpayer ; on the contrary, there is a general disposition to suppose that the tax represents a loss of wealth for the taxpayer and for society.

" The other error consists of treating all economic

¹ *Report*, p. 164.

phenomena, and therefore also taxes, from the point of view of the producer, who is directly subject to the tax and translates it into an increase in cost or a diminution in profits; whence it is supposed that the immediate effect of the tax is to increase prices, through a reduction or a threatened reduction in supply.”¹

And he goes on:

“In no case is the immediate effect of the tax such as to modify the existing supply of goods. . . .

“The supply remains, for the moment, as it was.

“The same cannot be said of demand. . . . The *immediate* and *necessary* effect of the tax . . . is that it changes the previously prevailing demand curves for private goods on the part of the taxpayers and the State. . . . This implies variations, upward and downward, in the previously prevailing system of prices. . . .

“The producers of goods the demand for and price of which have increased, shift the tax; the others feel its incidence. . . .”

“But”, he continues, “these phenomena are not definitive. . . .

“On the abstract hypothesis of free competition the following results will be realised: first, the producers who, as a result of increased demand, have shifted the tax will tend to increase production; second, the producers who, as a result of decreased demand, have borne the incidence of the tax will tend to decrease their own production, transferring their activities to industries of the first group; third, new savings and new labour-power, as they become available, will strengthen the two-fold movement of the first and the second groups.”²

¹ *Op. cit.* pp. 148-9.

² *Ibid.* pp. 152-5.

Numerous attempts had been made to take into account the reactions of taxation from the side of demand before this passage was written; but the endeavour to make expenditure of the tax proceeds a part of the general theory of incidence was greatly strengthened by De Viti's work, and the improvements that have resulted have been very considerable.

6. Another aspect of his theory, one which should not pass unnoticed by the student, is that De Viti makes use of the methods of general equilibrium analysis and insists that, in discussing the incidence of a tax, we must assume that the system commences at a position of equilibrium in which the tax which is imposed is the only element producing change; and the system can again come to rest in a position of equilibrium, only after all the forces towards change have worked themselves out, and each individual consumer and producer has attained the most desirable situation which it is open to him to achieve. A similar conception of equilibrium has been used by many other writers in public finance, but their use of it has nearly always been implicit; in De Viti's hands the method is made explicit.

His conception of general equilibrium, too, is sufficiently wide to embrace a theory of the State or Government, in so far as it gathers revenue which it devotes to ends such as road construction, maintenance of the army and navy and the social services. As Einaudi remarks, De Viti's concept of the State makes his theory specially suitable as a starting point for the inquiries of others, who, while they may not be able to agree with the entire working-out of his theory, will yet be able to accept all its essential assumptions.

Thus, a number of theorists in public finance have found it possible to start off from the same premises as De Viti: they have incorporated those results of his analysis that had been satisfactorily established and have gone on to establish others which their successors will find it possible to accept. This explains — among other things — why De Viti's work should be held in such high esteem: it can be made the basis for an exact theory of public finance.

7. Conclusion: One of the main virtues of the *Colwyn Report*, we pointed out, was that it took into account the variability of the supplies of the factors of production induced by the imposition of the income tax; while one of its main defects was its inability to take into account changes brought about from the side of demand. In the converse fashion, although De Viti's theory makes allowance for changes from the side of demand, it will be found that his work altogether overlooks changes brought about by the tax in the supply of savings or of labour, and treats these important aspects of the problem as if they did not exist. In our attempt to obtain a more complete picture of the incidence of a general income tax we must have regard to the manifold effects produced on the demands for commodities, and as well effects produced in the supply schedule of the factors of production. The main ingredients for a satisfactory theory of the income tax seem to be provided if we combine the *Colwyn Report's* treatment of the effects of the tax in producing variation in the supplies of the factors of production, with De Viti's treatment of the demand aspect, and make use also of his economic conception of the State.

II
THE INCIDENCE OF PARTIAL
INCOME TAXES

CHAPTER V

A TAX ON THE INCOME OF A MONOPOLIST

1. LET us consider the case of a person who has a monopoly in the manufacture of an article, on whose income a tax is imposed. We suppose that the monopolist is confronted with a perfectly definite demand schedule for his commodity, and that he knows the shape of it in the neighbourhood of the point of equilibrium; also the shape of his cost curve in the neighbourhood of the point of equilibrium.

We can conveniently refer to the factors which the monopolist himself supplies as his private factors.¹ In this paragraph we consider the case in which the private factors of the monopolist in the business concerned are in a supply which is fixed and cannot be altered.

If the tax imposed is a proportional one and is constructed so as to fall on the reward to the private factors of the monopolist, then very simple reasoning shows that the price of the commodity will remain unchanged. The monopolist had fixed price before the tax so as to get the maximum possible reward. Let the tax be one of 20 per cent. If he leaves the price unaltered, his net reward will be 80 per cent of the maximum gross reward. But this is greater than 80 per cent of any other reward. By leaving the price of the commodity unaltered, therefore, he will get the

¹ This terminology is used by J. R. Hicks, "Annual Survey of Economic Theory; Theory of Monopoly", *Econometrica*, 1935.

greatest reward that it is open to him to achieve. Hence in the case considered, a proportional tax has no effect on either the price or the output of the commodity.

Next, let us suppose that the tax which has been imposed is not proportional, but is progressive in amount. In diagram I let AR and MR be the average and marginal revenue curves respectively, to the monopolist, and let AC_1 and MC_1 be his curves of average and marginal costs before the tax.

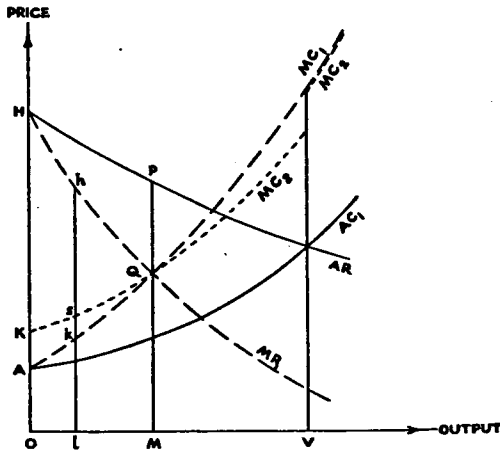


DIAGRAM I

Over the range O to V curve MC_1 is drawn as ——— and MC_2 as In the range beyond V both curves are coincident.

In order to maximise the revenue to his private factors the monopolist will fix output at the level OM given by the intersection of the marginal revenue and marginal cost curves. The price corresponding to this output is PM .

In the diagram the $0l$ th increment of output is shown as affording a return kh to the monopolist.

Of this return the tax absorbs a portion ks . This occurs for the revenue from each unit of output, and the curve of marginal costs to the monopolist becomes displaced into the position MC_2 . Since for the OM th unit of output, marginal cost had been equal to marginal revenue, the monopolist had gained no return on this unit. Therefore he will pay no income tax on it, and the curve MC_2 will intersect the curve MC_1 in the point Q . Thus the curve of marginal costs for the monopolist after the tax has been imposed, will still intersect the curve of marginal revenue MR , in the point Q : and an output OM will still maximise the revenue to the monopolist's private factors. The corresponding price remains unchanged at PM . Price and output are the same for the monopolist after the tax as they had been before it.

Hence we see that when the private factors of a monopolist are in fixed supply, a tax on his income leaves the price and output of his commodity unchanged, whether the tax be proportional or progressive in amount. In the diagram the net revenue of the monopolist before the tax had been equal to area AQH . After the tax his net revenue is KQH . The exchequer has absorbed an amount of revenue AQK .¹

2. The supply of the monopolist's private factors

¹ A case not envisaged in the above is discussed at some length by Amoroso, viz. where the marginal rate of the tax becomes sufficiently high as to absorb the whole of the monopolist's profit from each additional unit of output. In this case there will be an equilibrium output to the left of the point M in the diagram, and also, as can be seen from considerations of symmetry, an equilibrium output to the right of M . He may choose either of these two points of equilibrium. Cf. Amoroso, *Lezioni di Economia Matematica*, p. 226 f.

The case which we have treated and also the case discussed by Amoroso are both covered by the following mathematical proof:

Let the monopolist's total revenue from an output of x units be $R(x)$ and his total cost be $C(x)$.

to this line of production, however, may not be fixed. To see what is meant let us suppose, to begin with, that the nature of the industry is such that the monopolist's private factors have to be applied either all-in-a-lump or not at all. An instance of this might be

The reward to the monopolistic factors, which are in fixed supply, is

$$I(x) = R(x) - C(x).$$

Denote the total tax payment, which is a function of I , by $T(I)$. T is also a function of x , so that we can write it $T(x)$.

Before the imposition of the tax the monopolist maximises I . In order that equilibrium should exist, it is required that

$$\frac{dR}{dx} = \frac{dC}{dx}, \quad \dots \quad (1)$$

with the corresponding condition for a maximum, of differentials of the second order.

After the imposition of the tax the monopolist maximises his net revenue $I(x) - T(x)$. The necessary condition for equilibrium, therefore, is that

$$\frac{dI}{dx} - \frac{dT}{dx} = 0,$$

i.e.

$$\frac{dI}{dx} \left(1 - \frac{dT}{dI} \right) = 0. \quad \dots \quad (2)$$

In equation (2) there are two factors: it is sufficient that either of them should be equated to zero.

If

$$\frac{dT}{dI} = 1,$$

then

$$\frac{dT}{dx} = \frac{dI}{dx}.$$

This is the case discussed by Amoroso, in which the marginal rate of imposition of the tax becomes sufficiently great to absorb the total profit from each unit of output. The curve MC_2 in diagram I, would intersect MR to the left, and again to the right, of the point Q .

In the text we do not envisage a marginal rate of taxation of over 100 per cent, such as this would require, as being possible. Hence, for equilibrium in the case there discussed, it must be the other factor

$\frac{dI}{dx}$ that is equated to zero. This gives

$$\frac{dR}{dx} = \frac{dC}{dx}, \quad \dots \quad (3)$$

which is the same as equation (1). Therefore in this case output and price are the same after the tax as before it.

where the monopolist had to superintend a process for ten hours a day, say, or not at all.

In this case the net reward to the monopolist's private factors is equal to area KQH after the tax instead of AQH as initially. (See diagram I.) The net return to his private factors may now have fallen below the return that they could get in some other part of the industrial field; and if so he will withdraw entirely from the original line of production. The monopolised good will no longer be manufactured.

The more general case, however, is that in which the monopolist can vary the supply of his private factors, labour and capital, as between the production of the monopolised commodity and other commodities. This is also the more important case for practice. Let us illustrate it by a diagram :

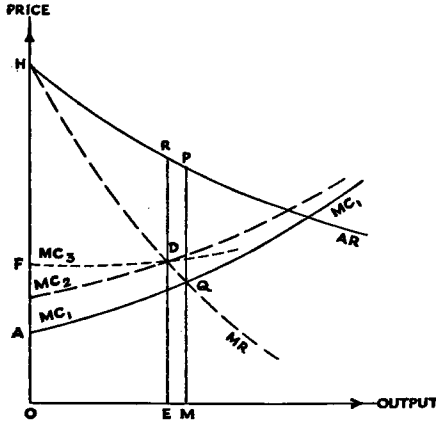


DIAGRAM II

The curve MC_2 is drawn as — — — — —, the curve MC_3 as ······

The curves AR and MR in diagram II are the curves of average and marginal revenue respectively

to the monopolist ; MC_1 is the curve of marginal costs to him before the tax is imposed. In the case we now deal with, the monopolist's private factors are in variable supply to the production of this commodity, *e.g.* he may be able to transfer part of his supply of labour from this to other lines of production ; and may be able to devote his capital either to this or other lines. We assume that it is the whole of the monopolist's revenue from this line of production which is taxed.

When he is drawing up the schedule of costs of production for his business, the monopolist must take into account the cost of his own labour and capital. Each unit of these he will charge to the firm at the figure which the unit would fetch in the most profitable other use open to it. In the case of his labour, if the 7th unit of it, say, which he exerts per day, could fetch in its most profitable other use a sum of seven shillings, he will charge this unit of labour, in the cost schedule of the monopoly, at seven shillings. In the case of capital his system of costing will be the same. If, *e.g.*, the competitive rate of interest be 4 per cent, then he will always charge his capital to the monopoly at this rate.

Since the cost curve MC_1 includes payments to the monopolist's private factors in this way, it is not possible to read off from the diagram what his total revenue is before the tax is imposed. He gets the return that his factors would yield him if employed in their most favourable uses outside the business ; and in addition he gets a surplus return over and above this, equal to AQH (diagram II). His output before the tax is OM, at a price PM.

When the tax is imposed the curve of marginal

costs MC_1 , to the monopolist, will undergo two separate and independent displacements. In the first instance the cost he charges to each unit of labour, and each unit of capital that he devotes to the business, must be raised. Suppose, for example, that the tax be one of 10 per cent. Then 10 per cent of the return that he gets on the 7th unit of his labour will be absorbed by the tax. He had formerly charged this unit of labour in his costing, at seven shillings to the firm. Before his reckoning will be complete he will now have to charge the unit to the firm after the tax at $7(1 + 10/100)$ shillings, that is at seven shillings, 8·4 pence.¹ Similarly each £100 of capital which he employs in this line of production he will now have to charge to the firm at $4(1 + 10/100)$ per cent, that is at 4·4 per cent: because he has now to incur an additional cost on behalf of each unit of labour or capital which he devotes to this line of production, a cost taking the form of a tax payment on the return he gets from the unit. (We are assuming that the rewards to the resources in the most profitable alternative occupations remain unaffected.)

In this way the monopolist's curve of marginal costs, MC_1 , is made to undergo an upward displacement into the position MC_2 , as shown. Since the costs incurred in the production of the QM th unit of output have increased, the new curve of marginal costs MC_2 will not pass through the point Q , but will lie above it. Every point on the curve in fact must undergo a vertical displacement.

In addition the tax absorbs a portion of each increment of monopoly surplus that accrues to the

¹ Throughout this chapter we are disregarding the question of the supply of effort in terms of income.

producer, this being the revenue from his factors when employed in their monopoly use over and above what they would fetch in their most favourable outside employment. The effect of this is to raise the position of the curve of marginal costs, MC_2 , into the position MC_3 . If, after the previous displacement of the curve into the position MC_2 , it had intersected the curve of marginal revenue at the point D, corresponding to an output OE, then since the monopoly surplus from the OEth unit is zero, no tax is paid on the zero surplus corresponding to this unit, and the curve MC_3 will also intersect the curve of marginal revenue in the same point D.

In this case the producer's output, given by the point of intersection of his curve of marginal costs MC_3 , with that of marginal revenue, will be OE instead of OM as initially. OE is always less than OM. His output will have contracted and the price of the commodity will no longer be PM, but the higher amount RE.¹

The extent of the resultant contraction in output

¹ Using the same terminology as in footnote, p. 47, *supra*, the monopolist's costs are now a function both of output and the height of the tax; so that we may write total costs now as $C(x, T)$.

The monopolist's gross reward

$$I = R(x) - C(x, T).$$

If P be net reward after payment of the tax,

$$\begin{aligned} P &= I - T \\ &= R(x) - C(x, T) - T. \end{aligned}$$

His net reward is a maximum if

$$\begin{aligned} \frac{dP}{dx} = 0 &= \frac{dI}{dx} - \frac{dT}{dx} \\ &= \frac{dI}{dx} - \frac{dT}{dI} \frac{dI}{dx} \\ &= \frac{dI}{dx} \left(1 - \frac{dT}{dI} \right), \end{aligned}$$

and rise in price depends on the amount of the vertical displacement which has taken place between the initial and the new position of the curve of marginal costs. It depends also on the slope of the demand and cost curves of the firm. The more gentle the slope of the demand curve, *i.e.* the more elastic is the demand, the greater will be the falling off in output. If the monopoly operates under conditions of falling costs, then the steeper the slope of the curve of marginal costs the greater will the contraction in output be. If the monopoly works under increasing costs of production, the more gentle the slope of the curve of marginal costs the greater will be the contraction in output. The truth of these statements can be shown by drawing the appropriate diagrams.

3. In the case where uncertainty exists the above treatment requires modification. The monopolist's

i.e. if either of the factors in this equation is zero.

$$\frac{dT}{dI} = 1$$

only if the marginal rate of tax is 100 per cent.

If $\frac{dI}{dx} = 0,$

then $\frac{dR}{dx} = \frac{\partial C}{\partial x} + \frac{\partial C}{\partial T} \frac{dT}{dI} \frac{dI}{dx} \dots \dots \dots (4)$

The value of x , say x_2 , satisfying equation (4) is less than the value of x , say x_1 , satisfying equation (3) on p. 48, *supra*: because the curve $y = \frac{dR}{dx}$ has a negative gradient, and the two curves $y = \frac{dC}{dx}$ and $y = \frac{\partial C}{\partial x} + \frac{\partial C}{\partial T} \frac{dT}{dI} \frac{dI}{dx}$ have each got either a positive gradient or else a negative gradient greater than that of $y = \frac{dR}{dx}$; and for every value of x less than x_1 , the curve $y = \frac{\partial C}{\partial x} + \frac{\partial C}{\partial T} \frac{dT}{dI} \frac{dI}{dx}$ lies above the curve $y = \frac{dC}{dx}$.

reward will then be in the nature of profit. First let us suppose that the private factors of the monopolist are in fixed supply to the firm.

(a) The monopolist will not know the exact shape of his curve of marginal revenue ; and perhaps neither will he know the exact shape of his curve of marginal costs. It is possible that he will make an estimate of the most probable curve of marginal revenue and the most probable curve of marginal costs. Then corresponding to each price which he may charge, there will be the profit which he believes is most likely to accrue at that price.¹ Now if before the tax he believes that the price P will probably render his profit a maximum, after the tax (so long as the marginal rate of tax is less than 100 per cent), P will still be the price which is most likely to yield him the maximum profit. And the monopolist in these circumstances will leave price unaltered at the height P after the tax has been imposed.

(b) The monopolist, however, may have regard not only to the curves of most probable marginal revenue and marginal costs, but may also take into account the shape of the entire uncertainty schedule of net profits corresponding to each price which he might charge. For example, before the tax he may estimate the probability schedule of gains corresponding to the prices P_A , P_B respectively, to be as shown in diagram III. Without the tax he would, let us suppose, have chosen price P_A :

Now the effect of the tax is to absorb a portion of whatever size of gain accrues : it alters the shape of each probability schedule. Hence although without

¹ See R. H. Coase, "Some Notes on Monopoly Price", *Review of Economic Studies*, October 1937, pp. 20-22.

the tax the monopolist would prefer the schedule corresponding to price P_A , it is quite possible that when the tax alters the shape of each schedule of net gains, he will prefer the new schedule corresponding to price P_B , rather than that corresponding to price P_A . In this case, therefore, even though the private factors of the monopolist are in fixed supply to the business, the imposition of the tax may cause a change in price to take place. It is not possible to say

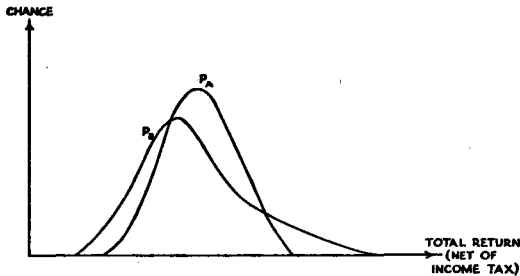


DIAGRAM III

whether the tax, in this case, will cause a rise or a fall in price. For the same monopolist at some dates in time it may cause a rise in price, at others a fall, if his attitude towards risks should alter between the dates.

4. Next let us consider the circumstances in which uncertainty exists and the private factors of the monopolist are in variable supply and the return to them is taxed.

(a) As before, it may be the case that the monopolist has regard to what he believes to be the most probable curves of marginal revenue and of marginal cost, and fixes price to give him the greatest net return which, on this basis, he expects to accrue. His curve of marginal costs, if he knows this curve definitely, or

his curve of most probable marginal costs, if he can only estimate it, will be raised from a position MC_1 into a higher position MC_2 . (See diagram II.) The curve of most probable marginal revenue will remain unchanged in position. The monopolist's output of the commodity, therefore, will be reduced, and the price of the commodity raised as a result of the tax.

(b) It may not be, however, that the monopolist considers only the modal or most probable outcome of each price policy. He may take into account the whole probability schedule of estimated profits corresponding to each different price. If so, there exists the possibility of an additional movement in price being superimposed on the rise in price which we obtain from consideration of the curves of most probable revenue and cost. This second movement, as we have shown in the previous paragraph, may be in the direction of either a rise or fall in price, and will perhaps sometimes tend to raise price, at other times tend to lower it; whereas the effect of the tax in raising the known or expected curve of marginal costs is constant in its direction, and always exerts a pressure to a price rise. As a rule, it would seem likely, the resultant and total effect of the tax would be to raise price and curtail output — the same result as when the private factors of the monopolist were in variable supply and there was no uncertainty.

CHAPTER VI

THE INCIDENCE OF A PROPORTIONAL INCOME TAX ON THE DIAMOND MONOPOLY IN SOUTH AFRICA

1. THE romantic story of the discovery of diamonds in South Africa is well known. Exploitation of the diamond fields had begun before 1870. By the early 1890's, due to the forceful personality of Cecil Rhodes, all of the important producing companies had come under the control of De Beers Consolidated Mines, Ltd., which has always pursued a policy of restricting the output of diamonds, so as to maintain their prices.¹ From that date till the early 1920's nearly the whole of the world's annual supply of diamonds came from South Africa. In the early 1920's, however, the monopoly of the De Beers Company began to be encroached upon; and before the end of the decade its monopoly had definitely been lost, important new sources of production coming into operation in the Belgian Congo, Brazil, Angola and British Guiana.

2. For a considerable time, extending down to the present day, the diamond-mining companies of South Africa have been subjected to a higher rate of tax than the other companies in the Union (if gold-mining companies are excluded, see Chapter VIII, *infra*). The extent of the differential taxation of the diamond-

¹ A. Plant, "Economic Development, 1795-1921", *The Cambridge History of the British Empire*, vol. viii: *South Africa*.

mining companies has varied in height at different times. In the Orange Free State a tax of 7 per cent was levied on the profits of diamond mines in 1907, and Cape Colony taxed these profits by 10 per cent in 1908. Uniformity of taxation was achieved with the formation of the Union of South Africa in 1910, and a tax of 10 per cent was levied on the profits of diamond-mining. In reckoning the profits assessable to this tax, an allowance was made for amortisation of the wasting asset, the diamond deposit itself: and also small or unprofitable mines, whose profits were below £1000 per year, were exempted from the taxation. During the war the rate of tax was increased to 12½ per cent. And the Income Tax Act of 1925 further increased the rate of taxation on diamond-mining to 15 per cent, with a lower rate of 10 per cent on payments of debenture interest made by the mines.¹ These rates of taxation still remain in force.

Let us inquire into the economic effects that a proportional or flat-rate income tax would produce in the South African diamond-mining industry over a long period, during which the industry retained its monopoly of world production. For the sake of definiteness *let us inquire what effects the tax of 10 per cent imposed in 1910 would have produced over a long period during which the De Beers Company retained its monopoly.*

3. Diamonds are a luxury article and it has repeatedly been found in the experience of the industry, at times when competition broke out among the amalgamated companies, that the demand for diamonds is very rigid. They are, in fact, a favourite textbook example of a commodity demand for which

¹ See De Kock, *Finances of the Union of South Africa*, chap. 9.

is rigid. No doubt while they remained the only producers in the field, the benefit derived by the De Beers Mines was very great.

To examine now the conditions of supply of the factors of production to the industry, the following table gives the average number of men employed per year in the diamond mines and the average annual value of purchases of stores by the mines during two periods :

Period	Average No. of Men employed per Year	Average Purchase of Stores per Year
1911-14	58,000	£ 1,400,000
1919-25	41,000	900,000

Of the total number of employees, about 1 in 5 were European or of European extraction.

Both native and European labour in the industry, would, over a long period, be fairly interchangeable with that for gold-mining : both industries, inside this period of time, would be drawing on the same reservoir of labour for their supplies. An increase or fall in the much smaller source of demand, diamond-mining, whether for European or for native labour, would leave the long-period wage rate for the factor little affected.

In a short period, an expansion or contraction of the industry would exercise some influence on the wage levels both of European and non-European labour, lowering wages in the short period if the industry contracted and *vice versa* if it expanded.

The conditions, then, appear to warrant us assuming that the long-period supply curves of European and non-European labour for the diamond industry, over the range of variation relevant to our present

inquiry, are perfectly elastic; and the short-period curves are less than perfectly elastic.

The annual value of the machinery, food and other stores purchased by the industry, as the above table shows, is not very great. These stores are supplied by a variety of outside industries, which, if the demand made for them by the diamond industry were to decline somewhat, could place the resources they employ, to a variety of other uses. The supply of stores to the industry over the long period we therefore regard as being perfectly elastic; and over the short period as being less than perfectly elastic.

The diamond-bearing land itself is of little or no use in other lines of industry; and if the diamond industry were to cease production, the mines, or vast pot-holes that were left, would remain as no more than geological curiosities. We can take it, therefore, that the supply of land to the industry when the tax of 10 per cent is imposed, will not, either in the long or in the short period, fall below its initial level: it will in no circumstances be bid away from diamond-producing by other industries, even though the rent payments it secures to the shareholders in the diamond-monopoly should decline.

Capital resources for the diamond industry were mostly obtained from abroad. It was suggested in 1937 that 70 per cent of the dividends of diamond-mining companies were paid to shareholders residing abroad.¹ Thus we can regard the capital invested in the diamond-mining industry as being a small portion of the international supply of capital which is sub-

¹ Landsberg, "South Africa's Imports of Capital and the Balance of Payments, 1932-36", *South African Journal of Economics*, 1937, p. 290.

scribed at the competitive rate of interest. That is, the supply curve of capital to the industry can be taken to be perfectly elastic.

This view, it is true, disregards the presence of uncertainty in the subscription of capital to the industry. But we have shown in the previous chapter (§ 4) that even although uncertainty exists, the effects produced by the imposition of an income tax on a monopoly can probably be obtained accurately enough from an analysis in which uncertainty is disregarded; and we will take no account of uncertainty in this chapter.

Any special effects which may arise from the fact that diamond-mining is an extractive industry in which the process of production is not continuous and the deposits become worked out, will be disregarded.

The revenue raised by taxation of the income of diamond-mining companies in the period 1910-25 amounted to only £320,000 per annum, or to less than 2 per cent of the total Government revenue. We should expect that the effects produced by the expenditure of this sum would be spread thinly over the entire industry of the Union; and that any effect produced on the supply of diamonds would be of the second order of small quantities and of negligible importance. The demand for diamonds, the market for which lies almost entirely abroad, would be quite unaffected by the expenditure of the proceeds of the taxation of the diamond monopoly.

4. The long-period analysis.

Had there been no tax, the diamond industry would have employed capital up to the point at which

it yielded a return equal to the competitive rate of interest, which, for the sake of definiteness, let us say is 5 per cent. After the imposition of the tax, the industry will only employ capital in each direction until it yields a gross return equal to $5(1 + 10/100) = 5\frac{1}{2}$ per cent, so as to leave capital which is subscribed to the industry from outside, or provided out of the resources of the diamond-monopoly itself, with a *net* return of 5 per cent. On this account, therefore, a contraction in the output of diamonds will take place over the long period, with a corresponding rise in their price.

As the contraction in the output of the industry takes place in the long period, less labour, both European and non-European, will be employed; but since the supply of both types of labour to the industry is, in the long period, perfectly elastic, eventually wage rates will be unaffected by it.

Stores supplied by other industries to the diamond-mining industry being perfectly elastic in supply, they also, in the long period, will be unaffected in price.

If we refer back to diagram II of the previous chapter, it is as if, over the long period, the curve of marginal cost to the industry had, through the change in the cost of capital to the industry and through the imposition of the income tax on the industry's surplus over costs, been raised from the position MC_1 into the final position MC_3 . Labour and stores costs are unaffected by the tax and play no part in the displacement of the curve MC_1 into the final position MC_3 .

Since the price of labour to the industry has remained at the same level, while the price of capital

to it has risen, a certain amount of substitution of the use of labour in place of capital will take place. The more readily is labour substitutable for capital in the industry, the smaller will be the eventual fall in output and rise in the price of diamonds. Again, we have said that the demand curve for diamonds is fairly rigid: this will be an influence tending to curtail the contraction in their output, but not the rise in their price.

Since, as we have found, over the long period the elasticity of supply of labour, stores and capital to the industry is perfect, these elements will share none of the tax burden of the industry, which in the long period will have come to rest entirely on the owners of the diamond-bearing ground and on the purchasers of the diamonds that the industry produces. The owners of the diamond-bearing ground, however, are the shareholders of the De Beers Mines Ltd., for the monopoly of the company had depended entirely on its possession of all the known diamond-bearing lands which seemed likely ever to be worked — that is, if some diamond-bearing lands existed which the company did not own, they seemed too poor in diamond content ever to be economically profitable. Thus the burden of the tax comes to rest eventually on the buyers of diamonds and on the shareholders of the De Beers Company.

5. The short-period analysis.

In the short period, we have said, the supplies of labour and of materials to the industry will be less than perfectly elastic. As a result of the tax, therefore, during the short period a lower price will be paid both for labour and materials: both these factors

will share a part of the burden of the tax along with the purchasers of diamonds and the shareholders in the De Beers Company.

The rate at which the output of diamonds will contract, and the resultant rate of rise in their price, will depend on the elasticities of supply of labour and materials to the industry in the short period. The more rigid the supplies of these factors, the quicker will be the falls in their own prices and the slower the rise in the price of diamonds. As well, the rate of rise in the price of diamonds will depend on the facility or difficulty of transfer of the plant that had been used in the industry, to other lines of production after the tax had been imposed ; and on the rate at which the plant in the industry wears out. If the diamond-producing plant is of but little service in other lines of production and wears out only very slowly, then the rise in price of diamonds and the contraction in output will tend to be the slower.

The shareholders in the De Beers Company in 1910 own both the land and the machines of the industry ; and the tax reduces the joint remuneration of these two factors, land and machines. So far as short-period conditions are concerned it is not possible to say definitely to what extent it is the rent of their land which is reduced, and to what extent it is the quasi-rents of their machines.¹

¹ In the long period the machines which had been in existence in the industry in 1910 will all have worn out, and the reduction in the annual dividends of shareholders in the monopoly will be due entirely to a reduction in the rents that they receive for their diamond-bearing land.

CHAPTER VII

THE INCIDENCE OF A PARTIAL INCOME TAX ¹

1. AN income tax which is imposed on the income of a particular industry may be graduated according to either a personal or an impersonal criterion. If the criterion is a personal one, then the income tax will be graduated according to the income and family responsibilities of the person who comes into receipt of the dividends paid by the industry. If the criterion is an impersonal one, the tax will be assessed, not on the incomes of the persons receiving dividends, but on the incomes of the firms themselves. In this case the height of the tax will depend on the size of income earned by the firm. The tax levied by the Government of South Africa on gold mining, for example, is graduated in this impersonal way.

We will suppose, to begin with, that it is in this impersonal fashion that the tax we discuss is graduated: the rate of tax depends on the size of income of the firm.

2. The following are the assumptions we make:

That firms in the industry are working under conditions of perfect competition.²

¹ Some aspects of the theory of a partial income tax have been finely treated by Fasiani in his article "Contributo ad alcuni punti della teoria della traslazione delle imposte sui 'profitti' e sui 'redditi'", published in *Studi Sassaresi* for 1931 and 1932.

² We do not envisage the production function as being homogeneous and of the 1st degree.

That the tax is imposed on the income of each firm in the industry and the marginal rate of tax is either constant or progressive.

That in both the long and in the short period of time after the tax has been imposed, entrepreneurs in the industry affected are able to hire factors of production at constant prices; that is, that the supplies of factors of production to the industry, in both the long and in the short period, are perfectly elastic. This assumption we afterwards remove to make provision for the important cases in which it would not hold good.

That the revenue collected by the Government from the tax is spent in such a way as not to affect the demand for the commodity which this industry itself is producing. (If, in the case of a partial income tax which is levied on a particular industry, the demand conditions for the commodity which the industry produces are affected by the expenditure of the tax proceeds, this will require to be taken into account in examining its incidence.)

It follows from our assumptions that the cost and supply conditions in the industry on which the tax has been imposed, will be unaffected by expenditure of the revenue.

3. Let us consider how costs of production of any firm in the industry are affected by the tax. The firm hires its factors after the tax has been imposed, at the same prices as initially. Its cost for labour and for land for any unit of production after the tax, if the technical coefficients of production of the firm remain unchanged at each scale of output, are the same for that unit as they had been before it. Let us suppose that the technical coefficients of

the firm remain unchanged in this way.¹

In diagram I, AVC_1 and MVC_1 are the curves of average and marginal variable cost, respectively, to a firm in the industry, and ATC_1 is its curve of average total costs. This firm had, before the tax was imposed, been in equilibrium at the output OM , when the price of its commodity was OP . This price and output had just enabled it to cover its variable costs of production $OM.QM$ in amount, and to earn over and above the normal rate of interest on the fixed capital it employed. The normal return on its fixed factors had amounted to $OM.RQ$.

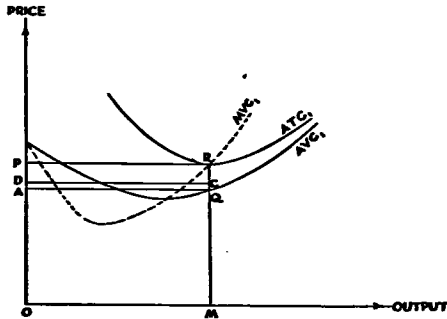


DIAGRAM I

The tax takes away part of the return to the fixed factors. To give an arithmetical example we may suppose that the tax imposed on the industry concerned is at a flat rate of 20 per cent. Then in the period during which the firm whose cost conditions are represented in diagram I, expects the price of its commodity to remain unchanged, it will expect the tax to absorb a portion $AQCD$, of the return to

¹ For a good discussion of the meaning of technical coefficients of production see H. Schultz, "Marginal Productivity and the General Pricing Process", *Journal of Political Economy*, 1929.

the fixed factors, equal to 20 per cent of their total return AQRP.

4. A fuller representation of this case can be given, and in a way that applies to either a proportional or a graduated tax. This is done in diagram II, which, like the previous diagram, supposes that the price the firm expects to receive for its commodity, at the point in time under consideration, remains unchanged at the initial level OP, and that the technical coefficients of the firm remain the same at each scale

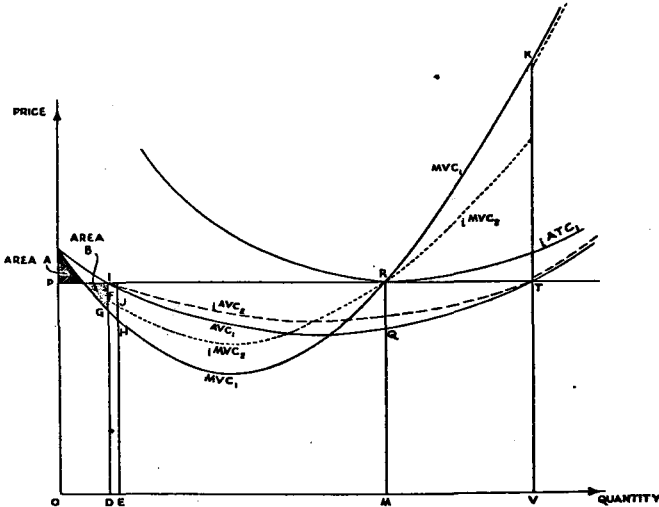


DIAGRAM II

The producer's expectation is that the price of the commodity will not have changed at the point in time under consideration.

The position of the average and marginal curves after the tax are shown by broken lines.

Area A = area B.

Curves MVC_1 , MVC_2 coincide over the range of production O to D. So also for AVC_1 , AVC_2 .

Area GHRI = area RTK.

Over range of output D to V curves MVC_1 , MVC_2 ; AVC_1 , AVC_2 are separate and distinct.

For output OV and over curves MVC_1 , MVC_2 ; AVC_1 , AVC_2 are again coincident.

of output after the tax, as they had been before it.

In the diagram MVC_1 and AVC_1 are the curves of marginal and average variable costs initially; and ATC_1 is the initial curve of average total costs. Initial price is OP . Area $A = \text{area } B$; the firm does not begin to make any return over and above its variable costs until its output has reached a level OD . After this output has been reached, each additional unit of output fetches a balance over and above the variable costs for the unit concerned. It is on this return over and above variable costs that taxation has to be paid; an amount of taxation $FGHJ$ being paid on the increment of output DE , and so on. The total amount paid in taxation when output is OM is shown by the area $GHRJF$. This is a cost which the firm must incur; it is an addition to variable costs. The marginal curve of variable costs therefore is raised as shown over the range DM , from its initial position MVC_1 into the new position iMVC_2 . To the new marginal cost curve iMVC_2 there will correspond a new curve of average variable costs iAVC_2 .

The subscript i is used in regard to the two curves iMVC_2 , iAVC_2 in order to impress that the positions shown for the two curves are the positions that they take up, at the end of a short period during which no reaction towards a higher price level is expected by the producer to have taken place. When it is expected by the producer concerned that there will be a higher price level at the end of any given period, the positions of the new curves of variable cost-including-tax for the corresponding period of time will be different from iMVC_2 and iAVC_2 and will lie above them; because then, for the increment of

output DE say, in diagram II, the labour and other costs are expected to be the same as before, but the price received for the increment is expected to be higher and therefore to bear a greater amount of tax payment. As soon as the price expectation alters, therefore, MVC_2 and AVC_2 are no longer the curves of cost-including-tax to the firm; new curves have to be drawn.

The curve of average total costs is referred to as ATC_1 , because the position of the curve shown is that which it occupied before, and not after, the tax was imposed.

Referring to the state of affairs shown in diagram II, after the output OM has been passed, each additional unit of output brings a net loss to the producer instead of a gain. Each such unit in the new circumstances secures him a diminution in his total tax payment, because of the diminution which it creates in the revenue to the fixed factors. Thus for an output greater than OM, the curve MVC_2 lies below the curve MVC_1 .

Shareholders in this industry now get a less remuneration from capital invested in it, than they would have got had their capital been invested in other branches of industry. Part of the plant originally in the industry will be transferred to other lines of production, and of the fixed capital remaining in the industry, part, when it is worn out, will not be renewed; *until a reduction in plant has taken place, sufficiently large to enable a new price to be established for the commodity which will afford the normal rate of return on fixed capital invested in the industry.*

The expected return to the fixed capital of the firm in diagram II is now FJRI instead of FJRI +

FGHRJ as formerly; the part FGHRJ has been absorbed by the income tax. It will be for the firm concerned to consider whether, taking this and other periods of time into account, it would not be possible for part or all of its plant to fetch a higher return in some other line of production. If, costs of transfer being taken

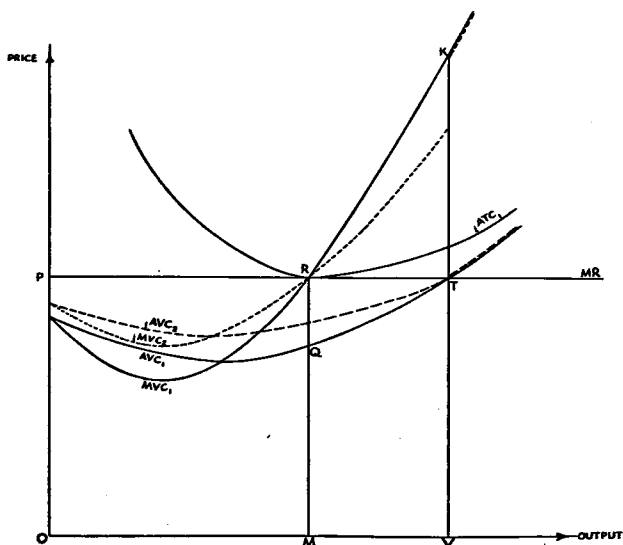


DIAGRAM III

into account, such a higher return could be obtained, then the transfer will be made. The higher the return which the plant will fetch in other lines, and the lower the costs of transfer to such other lines, the quicker will be the falling-off in the output in the industry and the quicker the rise in the price of its commodity.

Diagram III depicts the other possible case of the same phenomenon as is shown in diagram II. It shows the slightly simpler case where the curves of

marginal and average variable costs do not cut the price line in the downward part of their movement. The curves are named by the same symbols as before, and the reasoning is exactly parallel.

Further, if the technical coefficients of the firm remain unaltered over the long period, either of the

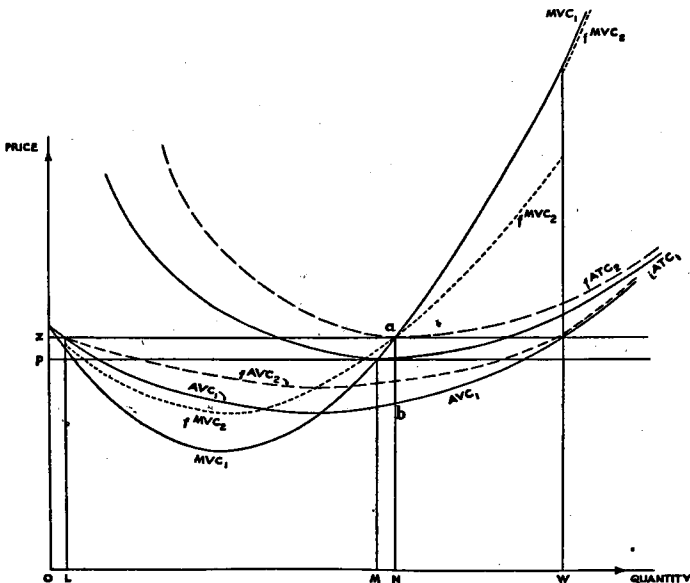


DIAGRAM IV

diagrams II or III can be taken and amended so as to show the higher price level that finally results. Diagram IV refers to the cost conditions in the long period and after the rise in price has taken place, for the firm to which diagram II had referred. The curves MVC_1 , AVC_1 and ATC_1 are the same in each of the two diagrams.

The price which the firm receives for its commodity

in the position of long-period equilibrium, must be sufficient to cover the variable costs of production and to afford at the same time the normal rate of remuneration, net of income tax, to the fixed capital it employs. This fixed capital, by hypothesis, is the same after the tax as it had been before it; and so the total net remuneration on the capital must be the same as it had been initially.

To see how the gross reward to these factors must have increased as a result of the tax, suppose that the reward to the fixed factors had initially been K ; then K must also be their final net reward.

Let the final gross reward of the fixed factors be $K + I$.

I will be the payment of income tax made on the firm's total gross reward.

If the tax imposed on firms in the industry is at a flat rate of 20 per cent, then I must be such that

$$(K + I) \left(1 - \frac{20}{100} \right) = K.$$

$$\therefore I = \frac{20}{80} K = 25 \text{ per cent of } K.$$

In general, let the marginal tax payment by the firm on a gross reward (profit) of i be at the rate $f(i)$. If, before the tax, the total fixed costs of the firm had been equal to K , then after the tax they will be equal to $K + I$, where

$$(K + I) - \int_0^{K+I} f(i) di = K,$$

that is,

$$I = \int_0^{K+I} f(i) di, \quad \dots \quad (1)$$

an equation in K and I and therefore sufficient to determine I .

The curve of average final total costs ${}_fATC_2$ will be raised correspondingly above the curve AVC_1 . The new price of the commodity must be at a level OZ (see diagram IV) sufficient to cover fixed costs to the firm on the new higher scale $K + I$. Unless price does permit it to cover costs on this scale, the firm will go out of production. Thus in diagram IV, the rectangle ab . $ON = K + I$, where I is defined by equation (1).

It is important to notice, when diagram II and diagram IV have reference, as we suppose, to the conditions of the same firm at two points in time after the tax has been imposed, that the curves MVC_1 , AVC_1 are the same in the two diagrams: the curves ${}_iMVC_2$, ${}_iAVC_2$ in diagram II represent the curves of marginal and average variable cost-including-tax to the firm at a point in time when it is expected that no price reaction will have taken place: and the curves ${}_fMVC_2$, ${}_fAVC_2$ in diagram IV represent these curves of marginal and average variable cost-including-tax when price has attained its final equilibrium level. The curves ${}_fMVC_2$, ${}_fAVC_2$ in diagram IV, are higher at all points over the range LN , than the curves ${}_iMVC_2$ and ${}_iAVC_2$ respectively, in diagram II.

Thus the diagrams II and IV afford some conception of the dynamics of the shifting process of the tax. If we assume that the tax is imposed suddenly and unexpectedly, then at the initial moment in time after the imposition of the tax, the price level of the commodity will be expected to show no change over its previous level: diagram II will give a picture of the state of affairs at this initial moment and for such subsequent points in time as price is expected to remain unaltered. The condition of affairs finally

ruling will be as shown in diagram IV.

If a time axis were to be drawn perpendicular to the paper, say, diagram II would give a cross-section of the resulting three dimensional figure at time zero; and at the other end of the axis, representing the equilibrium situation, would be diagram IV. The total rise in price is seen by a comparison of the two figures. The rise should, of course, be pictured as taking place gradually through time. In the same way the curves of variable cost-including-tax should be pictured as gradually moving up during the period of time occupied by the shifting process, from the positions ${}_1MVC_2$ and ${}_1AVC_2$, into the positions ${}_2MVC_2$ and ${}_2AVC_2$ respectively.

5. The diagrammatic treatment that we have given, forms, as it were, a skeleton of the theory; but some of the assumptions on which this treatment proceeds are fairly drastic, and may now be gradually relaxed so as to get a more realistic treatment of the case.

An assumption which we made was that the technical coefficients of production at each scale of output were the same after the tax as they had been before it. The effect of the tax, however, has been equivalent to increasing the cost of capital to this industry, while the prices of the other factors to it remain unchanged. In these circumstances, substitution of land and labour for capital in this industry, will to some extent take place. The greater the extent to which it is possible to carry this substitution, the smaller will be the resultant rise in the price of the commodity. That this is so will be evident if we reflect that the rewards to labour and land are untaxed.

A limiting case will occur when the degree of sub-

stitutability between the taxed factor capital, and the untaxed land and labour factors, is infinitely great. In this case the final equilibrium price of the commodity will be the same as the initial price ; but meantime a radical change will have been introduced into the method of manufacture. An infinite degree of substitutability of land and labour for capital in this wise, would never exist in practice : some amount of capital, of such a kind as to be subject to the tax, would, in practice, be needed in the manufacture of the commodity.

Some firms in the industry will be able to substitute the use of land and labour for capital more readily than others ; they may enjoy, for example, advantages in the employment of labour which others do not have. As a result of the change in factorial prices, such firms will come to occupy more important places in the structure of the industry than they had done before.¹

In the process of transition between the initial and final state of the industry, some firms, due to luck, or errors in judgment, will make fortuitous losses ; others will make fortuitous gains. From this cause again, some firms will find themselves better placed in the final equilibrium than they had been to begin with.

If the tax is graduated upwards according to the size of the firm's profits, the smaller firms in the industry receive a differential advantage in the new state of affairs as compared with larger firms. Small firms will tend to capture a bigger share in the total volume of the industry's trade.

¹ Compare the arithmetical example given by Ricardo, *Principles of Political Economy and Taxation*, Gonner's edition, pp. 188-9.

6. Initially and finally, the industry we are considering is supposed to be in a state of equilibrium, with uncertainty existing in the industry during the intervening process of change. When we take into account this uncertainty which is created by the tax, there will be two trains of consequences to consider. Consumers, for their part, will cut down their consumption of the commodity which has been affected by the tax; some will diminish their consumption abruptly, others will only diminish it gradually. Most of them will, for a time, experiment with substitutes, until their consumption settles down again to a new optimum combination of commodities. Likewise producers of the commodity will be experimenting. They will be running their works at new levels of output; only gradually will they exploit all the possibilities of substitution among factors of production in the new condition of affairs, and manage to arrive at a new optimum set of relationships with other businesses.

The demand curve for the commodity, therefore, will not remain unaltered in position as we had assumed; during the period of transition from the initial to the final state, its position will be altering throughout time. When the purchasers of the commodity discover, or anticipate, that its price is going to alter, then they will form estimates of probable future movements in its price, and adjust their subsequent purchases of the commodity accordingly; *e.g.* they will accelerate their demand for the commodity at any moment if they expect a rise in its price just after this. The less perishable is the commodity, the more play will be given to such anticipatory buying by purchasers: and this will be a force

tending to even out the course of the rise in price.

In the same way there will be a changing flux of producers' expectations as to the price that the commodity will fetch at the date in the future when it reaches the market. His expectation as to price is one of the determinants of the output of any producer; and producers' expectations, along with the technological and economic nature of the plant in the industry, will play their part in determining the course of the price and production changes that the tax brings about.¹ Over the longer period of time, producers' expectations will be superseded in importance, and determined in pattern, by events and by objective factors, such as the actual historical course of price. Only, in the earlier stages of the process, *i.e.* during the short period, expectations may exert a very strong influence on price and production.

7. When constructing his theory, Adam Smith makes one exception to the doctrine that a partial income tax is shifted. The exceptional case is where the tax is levied on the profits "of stock employed in agriculture". Such a tax, Smith considers, will cause no rise in the price of agricultural commodities, nor will it be borne by the farmer himself, who must have his due profit; instead, it will be borne by the landlord in the form of a diminution in rent.²

This example of Adam Smith's corresponds to a case not envisaged in the preceding treatment — that

¹ When both the demand and supply are varying through time, the path traced out by the resultant price change will depend on the velocity of the movement of the demand curve relatively to that of the supply curve. See Fasiani, "Velocità nelle variazioni della domanda e dell'offerta e punti di equilibrio stabile e instabile", *Atti della Reale Accademia delle Scienze di Torino*, 1932.

² *Wealth of Nations*, Cannan's edition, vol. ii, p. 340.

in which the industry which has been taxed employs an appreciable proportion of the total supply of one factor of production. Should this be so, when a rise takes place in the price of the commodity being produced, less of the factor of production concerned will be required to place the smaller output on the market. A fall in the price of the factor will therefore take place; and the fall will be greater, the greater the proportion of the total stock of the factor which is employed by the industry, and the smaller the substitutability between it and other factors in outside industry. In these circumstances the industry will partially avoid a rise in the price of the commodity, and a fall in the quantity of it produced, by sharing part of the tax burden with another factor. The longer the period of time allowed to elapse, however, the greater will be the tendency for the factor concerned to move into other industries, and for a rise in the price of the commodity, and a falling off in its production, to take place.

8. If the tax is graduated according to the earnings made by the firm (as also when it is graduated according to a personal criterion), typical phenomena of tax-capitalisation will be called into existence. The tax on each firm will be capitalised or amortised, in the form of a fall in the price of the firm's shares.

Later in the book it will be seen that changes in capital values are also brought about by a general income tax.

None the less, Einaudi suggests¹ we should not refer

¹ " Osservazioni critiche intorno alla teoria dell' ammortamento dell' imposta e teoria delle variazioni nei redditi e nei valori capitali susseguenti all' imposta ", *Atti della Reale Accademia delle Scienze di Torino*, 1918-19, section xiv.

to the changes in share values which take place when a general income tax is imposed, as being instances of tax capitalisation: we should refer to them less specifically, he says, as being "changes in capital values". The grounds for distinction between the two cases are purely pragmatic. For the term "capitalisation of a tax" to be appropriate, says Einaudi, the fall in capital values should be concentrated on one group of firms; and the rate of interest should be left unaltered by the tax.

This usage would restrict the term "capitalisation" to cases where the phenomena are clear-cut. To effects that are wider, and less clearly articulated, it would apply the less specific term "changes brought about in capital values". The suggested terminology does call to mind a useful distinction between the two kinds of phenomena and deserves to be adopted.

When the partial income tax is imposed, only one set of share prices will be affected: the share prices of other firms will be unaffected. It will be an instance of tax capitalisation.

9. We have already mentioned that a tax may be graduated in either of two main fashions. Graduation in the case that we have considered has been in accordance with an impersonal criterion, the size of the firm's earnings. The criterion may, on the other hand, be a personal one, according to which the height of the tax is made to vary with the income and family circumstances of the recipient. With both types of tax, the phenomena of tax capitalisation will come into existence.

If the tax on the industry concerned is graduated in a personal way and is progressive in amount, then it will fall more heavily on the richer shareholders in

the industry concerned. There will therefore be an immediate sale of shares by these richer shareholders to individuals in lower income strata. The sellers of shares will, in each transaction, receive an amount equal to the former value of the shares *minus* the capitalised value of the tax; not, however, of the tax capitalised at the rate payable by the richer shareholders, but at the rate payable by the marginal buyer or seller; that is, the rate payable by the richest person who is just induced and no more, at the existing scale of taxation, to acquire or retain the shares. This rule will apply whatever proportion of the whole block of shares in the community the taxed shares may constitute.

Thus a tax of this kind might prove an excellent instrument for a Government to use, which wished to cause the transfer of the capital in a certain industry to the ownership of a less wealthy section of the population.

CHAPTER VIII

THE INCIDENCE OF A PROPORTIONAL INCOME TAX AND OF THE PRESENT INCOME TAX ON SOUTH AFRICAN GOLD MINING¹

1. Some preliminary explanation of the situation of the gold-mining industry of South Africa in the period after 1932 seems essential to the following discussion.

Gold mining occupies a position of cardinal importance in the structure of the national economy of the Union of South Africa. Without this valuable resource the national income of the Union would be considerably lower than it is. Gold mines, however, are a wasting asset; and the rate at which this asset wastes is such that, given a continuance of the existing trends, it had been expected, before the era of monetary disturbances set in in 1931, that the gold yield of the country would reach the peak of its development in 1935, and thereafter would enter on a period of decline.² This, from the point of view of the economic structure of the Union, looked to be a very serious matter indeed.

A vital element in the determination of the length of the economic life of the Union's gold fields was going

¹ Subsequent investigations on the incidence of taxation on gold mining must be indebted to W. J. Busschau's work, *The Theory of Gold Supply*; and to his two articles, "Gold Mining Taxation, a Method of Analysis", *South African Journal of Economics*, 1935, and "The Future of Gold Supply", *The Incorporated Accountants' Journal*, July 1936.

² See "The Rand's Vast Resources", by J. C. Lawn, in *Gold*, a reprint of the Special Number of *The Times*, Tuesday, June 20, 1933, p. 104.

to be the mining of marginal ore, *i.e.* ore whose gold content was relatively small, or else ore whose content was fairly high but which had high costs of working. There were wide areas of ore which were of a grade just a little too low to render their working a paying proposition. Means, therefore, were frequently discussed of the most feasible method of rendering the low-grade areas of the Union economically workable.

The suggestions put forward for assisting the Union's gold industry, and in particular for helping to raise the low-grade section of the field above the margin of profitability, need not be considered now, for chance came to the assistance of the Union — Great Britain left the gold standard in September 1931, and other countries followed suit. In December 1932 South Africa, after experiencing a period of indecision as to monetary policy, during which the economic position of the gold industry gained no added advantage, took the step of devaluing her currency and pegging it to the £. The country's gold industry received a tremendous fillip.

The reasons for this can be seen from the following arithmetical example.

Suppose that initially the value of the South African £ had been £ = \$5; and that it is devalued so that finally £ = \$4, while the gold value of the \$ remains constant.

We suppose the internal price level for South Africa to remain constant.

Initially let 1 oz. of gold be worth £4 (= \$20), and cost £3 : 10s. to recover; the company's profit from the recovery of 1 oz. of gold = 10s. = \$2.50.

After the £ has been devalued by 20 per cent, the costs of recovery of the gold (from our hypothesis of

an unaltered price level), are the same as they had been initially.

I.e. costs of recovery of 1 oz. of gold = £3 : 10s.

But the value of 1 oz. of gold is still \$20 = £20/4 = £5 at the new ratio of exchange.

The producer's profit from the recovery of 1 oz. now = £1 : 10s. in place of 10s. initially ; or in terms of foreign currency is now \$6 in place of \$2.50 initially.

For reasons shown by this arithmetic, the gold industry of the country derived a great advantage from the devaluation of the South African currency.

As a result of the currency devaluation, mines that were already in existence earned profits from a given gold production, on a much higher scale than formerly; and also much ore that had formerly been below the margin of production now began to be exploited. New shafts were sunk to open up low-grade mines ; some mines which had been closed down were reopened ; existing mines extended their workings to ore of a lower grade ; exploration and prospecting for new gold areas was quickly begun.

The Gold Producers' Committee of the Union had estimated in the pre-1931 situation that a 4s. fall in working costs per ton would double the amount of ore economically workable.¹ Later Sir Robert Kotze calculated that if an average price of 106s. per fine ounce of gold could be maintained, this would be equivalent to a lowering of working costs by the 4s. per ton that we have mentioned, provided costs for labour and materials for the industry did not increase.² In fact the costs of labour in the Union and

¹ *Report of the Low Grade Ore Commission, 1932, p. 25.*

² Sir Robert Kotze, "The Gold-Mining Position", *South African Journal of Economics, 1933.*

the wholesale prices of commodities have moved very slowly since 1932. Between 1932 and 1937 wages of native labour rose by only 2 per cent, wages of European labour by 6 per cent; the wholesale price index rose by 10 per cent, which was much less than the rise in wholesale prices in the United Kingdom between the two dates, viz. 32 per cent (*Economist* index number). Meantime the price of gold, which used to be 85s. per fine ounce, has, since 1934, scarcely ever been below 140s. per fine ounce. This has been equivalent to a fall in mining costs of 6s. 6d. per ton and has been estimated to increase the ore reserves of the Union, as compared to the period before 1931, by 150 per cent.¹

Some of the altered circumstances of the industry since 1931 can be seen from the following figures which relate to the gold industry of the Witwatersrand, whose output is over 90 per cent of the total output of the Union :

TABLE I
THE GOLD-MINING INDUSTRY OF THE WITWATERSRAND,
1931-36

Year	Tons of Ore treated (millions)	Yield, dwt. per ton	Gold Production, fine oz. (millions)	Gold Production, Value (millions)	Dividends paid (millions)
1931	32	6.4	10.4	£43.9	£8.0
1932	35	6.3	11.0	£47.2	£8.4
1933	37	5.7	10.4	£64.7	£12.4
1934	39	5.0	9.8	£67.0	£14.5
1935	44	4.6	10.0	£74.2	£16.4
1936	47	4.4	10.5

The table shows that in the later years a larger quantity of ore is being treated, and ore of a much

¹ C. W. B. Jeppe, "The Future of the Rand Gold-Mining Industry", *South African Mining Year Book*, 1936-37, p. 25.

lower grade than was treated in 1931 or 1932. The physical amount of gold recovered in each of the years in the period, is about the same as it was in either of these years; but the value of the gold in the later years is much greater; and the total dividends paid by companies in 1935 were more than twice the figure of 1931.

Many old mines have been reopened, and new mines sunk, which will become gold producers within the next few years. It has been forecast that the number of mines producing gold by 1947 will be double the number of 1932.¹ These facts help to impress both the prosperity that the South African gold industry has enjoyed since 1932, and the very considerable extension in life that has been given to her gold industry by the monetary changes which have taken place.

The finances of the South African Government benefited considerably from the prosperity of the industry. The Government had for a considerable time before this levied a special tax of 15 per cent on the profits of gold-mining companies, raised in 1932 to 20 per cent.² So great, however, was the prosperity of the industry and so rapidly did the situation develop, that after 1932 the Government altered its tax legislation in the industry year by year, and sometimes, in order to better adjust it to the develop-

¹ Jeppe, *ibid.* p. 25.

² In addition to its increased tax revenue, the Government derived benefit from its direct participation in mining profits. "Besides receiving a large revenue from the mines in the form of direct and indirect taxation, the State owns valuable mines and mining claims on the Far East Rand. These properties it wisely allows adventurous companies to develop and work, on a leasehold basis, receiving a share of the profits—a method which combines profitable returns with entire absence of capital risks" (W. H. Dawson, *South Africa*, p. 272).

ing situation, even during the course of the financial year. The Government well realised, for the complaints on the score were numerous, that rapidly altering tax measures were in all likelihood doing harm to the industry. It appointed a Departmental Committee of six persons to go into the question of taxation of the industry and devise a system for taxation of gold mining which would be able to stand without amendment for a long period ; and it accepted the recommendations which the Committee made.

The tax on gold mining down till 1932 had been a proportional income tax ; that suggested by the Committee and adopted by the Government in 1936 was an income tax graduated after a special fashion, which we later go on to explain. There is doubt and controversy, however, as to whether a proportional tax would not be better than the present form. We will examine in the following paragraphs the incidence of a proportional tax, and then of the present tax on the gold-mining industry in South Africa.

2. For the purpose of analysing the effects of these taxes we are able to regard the gold-mining industry of South Africa as being a competitive one. There are a fairly large number of companies in it : in 1931 over thirty, and considerably more now. All of the companies, with few exceptions, fall under the control of half a dozen large corporations. But despite this, the most important decisions relating to the affairs of each company appear to be taken by its own shareholders, only a small degree of coercion being applied from above by the controlling corporation.¹

¹ J. Martin, " Group Administration in the Gold-Mining Industry of the Witwatersrand ", an address before the Economic Section of the British Association in Johannesburg, 1929 ; *Economic Journal*, 1929.

Moreover, even though the number of companies in the industry were small, no monopolistic restriction would occur in gold mining, for each mine is producing a commodity, the price of which in the short period is fixed irrespective of the output of the mine itself: the demand for the output of each company (and of the industry as a whole), is perfectly elastic. In the long period it is less accurate, but sufficiently accurate for our purpose, to regard the demand for gold produced in South Africa as being perfectly elastic over the relevant range of production, *i.e.* over the range lying between the output of the industry when there is no tax and the output of the industry when the tax has been imposed.

What is the position relating to the supply of the factors of production to the gold-mining industry?

Funds supplied to the industry from home sources will probably be in less than perfectly elastic supply: because the industry forms an appreciable portion of the total of South African industry; and local patriotism, a believed superiority of local knowledge, as well as ignorance of the opportunities of the wider market, will render the curve of supply of home capital to the industry an upsloping one.

On the other hand, investors abroad have so wide a market in which to invest their capital that only a small fraction of the supply of this money will be absorbed by South African mining. The supply of capital to gold mining from foreign sources will, therefore, be perfectly elastic.

The larger part of the supply of capital has, in the past, actually been provided from sources abroad. Thus the Low Grade Ore Commission state in their *Report*: "The Commission is informed that about

three-quarters of the dividends, say £6,500,000 per annum, are paid to overseas shareholders".¹

As regards capital invested in the industry since 1932, Landsberg has made the following estimate : ²

Period	Total for Gold Mines	From Abroad for Gold Mines	Percentage of Capital subscribed from Abroad
1933-36	£34,700,000	£26,000,000	75

The supply of capital from one source (foreign) is perfectly elastic ; the supply from the other source (home) less than perfectly elastic ; it follows that the supply from both sources taken together will be perfectly elastic.

TABLE II

AVERAGE NO. OF EMPLOYEES (EUROPEAN AND NON-EUROPEAN) AND VALUE OF STORES CONSUMED BY THE GOLD-MINING INDUSTRY IN 1936

Year	Number of Employees		Value of Stores Consumed
	European	Non-European	
1936	38,000	324,000	£27,000,000

The industry employs an appreciable fraction of the total labour force of the Union (see Table II), whether European or non-European. Even in the long period, therefore, the supply curve of labour to the gold-mining industry will be less than perfectly elastic. The short-period supply of labour to the

¹ *Report* (1932), p. 22. Lehfeldt had thought that the proportion in which capital was supplied to the industry from home sources was greater than this. "It is stated on good authority that more than half of the dividends from gold mining now go to South Africans" (*The National Resources of South Africa* (1921), p. 12). The estimate of the Low Grade Ore Commission, however, is presumably based on information from official sources.

² *Art. cit.* p. 304.

industry will be more rigid than that of the long period; and the shorter the period the more rigid will the supply be.

Even though the value of stores consumed annually by the industry is large, over the long period their supply may be perfectly elastic: at any rate we should expect their elasticity of supply to be quite great.¹ In the short period the elasticity of supply of stores to the industry will be less than that of the long-period supply.

Since these are the circumstances, the technique of the previous chapter appears quite well adapted to dealing with the incidence of the income taxes levied on this industry. In three major respects, however, the analysis of a partial income tax given in the preceding chapter, and the analysis that we give now of a tax on gold mining, may diverge from the reality of conditions through over-simplification:

(i) An assumption we make is that the productive process in the industry is a continuous one: in gold mining, actually, the process is not continuous, but gradually runs down for each mine as its ore becomes exhausted.

(ii) We assume that both initially and finally no uncertainty exists in the industry, and that uncertainty only exists during the intervening process of transition from the initial to the final state. In reality uncertainty plays an important part in gold mining at all times.

If it should, in fact, be the case that, while uncertainty exists in the industry, yet gold-mining firms mainly have regard to the most probable values of

¹ Cf. Sraffa, "The Laws of Returns under Competitive Conditions", *Economic Journal*, 1926, pp. 540-41.

their costs and revenue, then the analysis we give becomes fairly satisfactory, if the curves which we draw are taken to represent the most probable values of costs and revenue, as anticipated by the firms concerned. But the manner in which gold-mining firms take account of their probable receipts and costs may be more complicated than this.

(iii) The theory of the incidence of a partial income tax was developed in the preceding chapter, on the assumption that the industry affected was small enough, or sufficiently independent of other industries, for an alteration in its scale of production to leave the level of activity in other industries, *e.g.* the railway industry, practically unaffected; and it was assumed that the effects produced by the expenditure of the revenue from the tax in each other line of production would be fairly small. But the proceeds of the South African tax on gold mining, as Table III shows, constitute a considerable portion of the revenues of the Union.

TABLE III

REVENUE FROM TAXATION OF INCOME OF GOLD MINING AND
TOTAL REVENUE OF THE UNION OF SOUTH AFRICA, 1933-36

	1933-34	1934-35	1935-36
Revenue from taxation of income of gold mines .	£9·7 millions	£8·3 millions	£9·7 millions
Total revenue of the Union	£37·6 „	£38·7 „	£39·7 „
Revenue from taxation of income of gold mines as percentage of total .	25	21	24

In addition to the revenue which the South African Government derives from the taxation of the profits of gold-mining companies, a not inconsiderable portion of its revenues — variously estimated between 10 and

25 per cent¹ — derives from taxation of (a) salaries and dividend payments of workers and shareholders in the gold-mining industry, and (b) salaries, dividends, etc., of people engaged in other industries whose continuance and prosperity is directly dependent on the gold-mining industry. Thus, when considering the incidence of any given alteration in the taxation of gold mining, which will produce a rise or fall in Government revenue, we ought to take into account the influence of the tax on the scale of production of related industries; and, from the side of expenditure of the tax proceeds, not only effects produced by expansion or contraction of governmental expenditure as its total receipts from the taxation of gold mining rise or fall, but also the effects produced by the increase or reduction in governmental receipts from taxation of the additional classes (a) and (b).

The procedure we actually follow will be a very simplified one in comparison with this. We will neglect all effects produced by a tax on gold mining, except in so far as they relate to the gold-mining industry itself. And we will disregard all effects produced from the side of expenditure by the Government of its revenue from taxation. We do so in order to avoid the difficulties entailed in the more proper and more adequate treatment; and in these respects the procedure we follow will only be of qualified accuracy.

3. We discuss now the incidence of a proportional income tax on South African gold mining; and for the sake of definiteness we suppose that the tax is one of 30 per cent.

In exact terms the question that we ask is this :

¹ Busschau, *op. cit.* p. 108 f.

If there has previously been no income tax on the South African gold-mining industry, and if, after the industry has attained a state of equilibrium, a partial income tax of 30 per cent is imposed on it, what will be the economic effects produced ?

The new capital entering the South African gold-mining industry after the tax has been imposed, must be able to obtain the competitive or normal rate of return, which is, let us say, 5 per cent. New capital, therefore, must be placed in lines of sufficiently high productivity to yield a gross product of $5(1 + 30/100) = 6\frac{1}{2}$ per cent.

The volume of output over the long period, therefore, will now be cut down as compared with what it would have been without the tax. The lands which are now worked will not be worked so intensively as they would have been had there been no tax. And some lands, in part low-grade lands and in part high-grade lands whose costs of working are also high, which, in the absence of the tax, would have been worked, now will not be worked at all.

Let us consider how the curves of cost and of revenue of a gold-mining company are affected by the tax. Since the demand for gold is perfectly elastic, the horizontal curve of marginal revenue to the firm, MR, will remain unaltered in height after the tax has been imposed. (See diagram I.) The curve of marginal variable costs to the firm before the tax is MVC_1 , of average variable costs before the tax is AVC_1 . These variable costs include all costs entailed in the production of the commodity (among others the cost of land), with the exception only of the cost of fixed capital. The return to the fixed capital of the firm is OM.RQ; and, since no un-

certainly exists, this will represent the normal rate of interest on the capital involved.

When the tax is imposed, if we assume that technical coefficients of production for the firm are

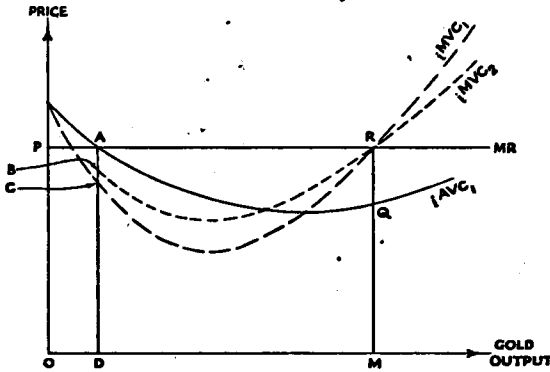


DIAGRAM I

the same at each scale of production after, as before, the tax, and that the price of each factor of production remains unaltered, then the new curve of marginal variable costs after the tax will be MVC_2 , as shown: because all of the firm's former costs of production have to be incurred, and besides, after the output OD has been passed, 30 per cent of the return to the firm over and above its former variable costs, have to be handed over to the Government in income tax.

In these circumstances, the return to the fixed factors of the firm will now, after the tax, be an amount $BR'A$ instead of $CRA (= OM.RQ)$, as formerly. This, however, will not give a possible state of long-period equilibrium: the fixed factors of the firm had initially been getting just a normal return: after the tax has been imposed, if the firm is to continue in existence in the long period, the fixed factors must again get a return not less than normal. From

which source, therefore, can the tax payment to the Government, CRB, be forthcoming ?

We have said that over the long period the supply of gold-bearing land to the industry can be taken to be perfectly rigid. This land will, in fact, consist of a number of different classes of gold-bearing land ; the supply of land in each of these classes is perfectly rigid. Labour to the industry will be in a supply that is less than perfectly elastic : and stores to the industry in a supply that, over the long period, is probably nearly perfectly elastic.

Let us suppose, *for the moment*, that labour and stores to the industry are both in perfectly elastic supply. This will enable us to make clearer, by assigning definite magnitudes to the other variables, the main effects which are produced by the tax over the long period.

The factors labour and stores are, on this supposition, in perfectly elastic supply : their prices, therefore, will bear none of the burden of the tax. Again, the price of the commodity produced by the industry cannot rise. Hence, if the firm whose cost schedule is shown in diagram I is to continue in production into the long period after the tax has been imposed, the whole burden of the tax — which on these suppositions can be borne neither by capital, by labour nor by stores — must be thrown on to the factor gold-bearing land. For the firm whose cost position is represented in diagram I, the rent it pays for its land must fall by the amount CRB. Only thus will the fixed factors employed by the firm be able to get their normal rate of return, and only thus will the firm be enabled to continue production into the long period.

Consider how this affects land in the three possible modes of ownership: (a) some companies own the land which they work; (b) some buy or lease land from other companies or individuals; and (c) some again buy or lease land to work from the Government. (We consider here both distributional and production effects.)

(a) Those companies which own the land which they mine, bear the burden of the tax in full. If the company whose cost schedule is shown in diagram I owns its own land, then the rent of that land will, in the long period after the tax has been imposed, fall to the figure equal to the value that it would have had had there been no tax, *minus* an amount equal to area CRB (supposing that technical coefficients remain fixed). If the rent that the land would have had, had there been no tax, were less than area CRB, the firm will not renew its plant as it wears out and will go out of production.

All those areas of marginal ore which the company itself owns, the working of which would yield a return to capital of between 5 and $6\frac{1}{2}$ per cent, would have been worked had there been no flat-rate tax; but on account of the tax it will now not pay to work them. Thus the production of the industry, or, to be exact, of both the low-grade section of it and of that portion of the high-grade section which is attended by high costs, will, as a result of the tax, go out of production. In this way the tax cuts down the activity of the industry.

(b) Since new capital that is invested in the industry must get its normal net return (5 per cent), companies which buy new land to exploit will, once equilibrium has been re-established, offer a sum for

such land, smaller to such an extent as still to allow them a net return on capital neither more nor less than normal. The tax, in this instance, is capitalised, and the whole burden is borne by the landowner in the form of a fall in the price of the land which he owns. The tax in effect, for such lands as still change hands after it has been imposed, transfers a sum equal to the capitalised value of the tax from the landowner to the Government. The landowner would have received this money in a lump sum for the sale of his land: the Government receives it instead of him, in the form of a series of taxes which the mining company pays to it over a number of years. The capitalised value of this series of taxes is equal to the sum of money which the landowner loses when he sells his land.

As in the previous case, under this head a number of low-grade areas which would have come into operation had there been no income tax will not now come into operation at all. Those lands which could have been bought for a price less than $\frac{1}{5} \times 100 = 30$ per cent of the total profit obtainable from their exploitation, would formerly have been worked and would have yielded the normal rate of return on the capital invested in them. But now, however low the price at which it would be possible to purchase these lands, it will not pay to work them. Under the head (b), therefore, production will again be cut down.

(c) If the land is owned by the Government itself, then the Government loses from the lands over which it holds mining rights, and *which it still finds it possible to lease out for working*, an amount of rental exactly equal to the sum which it receives from them by way of taxation, both being equal to area CRB. For such

lands a transfer of money from one revenue heading in the budget to another, is brought about ; a book-keeping change this, which leaves total Government revenue unaffected.

But just as it will no longer pay mining companies to make an offer for certain of the low-grade leases owned by private individuals, so it will no longer pay them to make an offer for the same class of leases which are in the ownership of the Government, viz. leases which afford a return of more than 5 per cent, but less than $6\frac{1}{2}$ per cent on the capital used in their working. This class of land owned by the Government would have come into production had there been no tax, but now will not do so. From it the Government would have received a revenue from mining leases had there been no tax. Now it receives nothing by way of lease, and nothing from tax revenue.¹

Under head (a) and under head (b), Government revenue is increased by the tax : under head (c) it is diminished. On balance, needless to say, Government revenue will be increased, or the tax would not have been levied.

Under each of the heads (a), (b) and (c) the output of the gold-mining industry is reduced, through marginal lands being forced out of production by the

¹ Since it is realised that an increase in taxation will have the effect of reducing the return from the enterprise, the mines have in many cases made allowance for this in the terms they offered for leases from the Government. Many leases contain a clause to the effect that if there be an increase in taxation above the existing level, the amount extra that the mines have to pay will be offset by a reduction of equal amount in their payment for the lease. See *The South African Mining Year Book, 1935-36*, pp. 15-19. Through clauses of this type in their leases, in 1933 companies got a reduction of £384,000 in their lease payments, and in 1934 of £527,000 (*Report of Departmental Committee on Mining Taxation, 1936, § 30*).

tax. This is noteworthy in view of the emphasis always placed by South Africans on the necessity for prolonging the life, and increasing the output, of the gold-mining industry.

This analysis shows how the most essential step in the process of movement towards long-period equilibrium comes about. In the long period the firm must be able to earn the normal rate of return on its fixed capital. It will be enabled to do so by the curve of marginal cost-excluding-tax moving from the position MVC_1 into a new position denoted by MVC_1 , say, (no diagram is drawn), which is lower at all points than MVC_1 . The curve of marginal cost-including-tax to the firm will likewise, at the end of the long period move into a new position MVC_2 , lower at every output than MVC_2 . Through this lowering of costs, some firms — those whose rent payments had initially been high enough to permit a fall of the requisite amount — will be enabled to remain in production into the long period. The firms whose rent payments had initially been less than this amount will go out of production.

We have been assuming so far, that technical coefficients of production for this firm of necessity remain fixed. This will not, in fact, be the case. When the price of capital has risen — the tax being levied on the profits of capital — while the price of labour and of stores remain the same, and the price of land has fallen, producers will substitute the use of the factors labour, stores and land for capital in some of its uses. On account of this alteration in technical coefficients of production, the cost curves to the firm will, over the long period, undergo a further fall.

Another supposition which we have temporarily made, namely, that labour over the long period is in perfectly elastic supply to the industry, is too extreme : its elasticity of supply over the long period will be less than perfect. To the extent that it and the factor stores to the industry, are in less than perfectly elastic supply, these factors will share part of the burden of the tax with the factor gold-bearing land. Yet, in the final equilibrium, it will undoubtedly be on the factor gold-bearing land that the great part of the burden of the tax comes to be concentrated.

We may therefore summarise the effects which will be produced by a proportional income tax as follows :

Long-Period Effects.—The greatest part of the burden of the tax will come to rest on the factor land, which is in rigid supply to the industry. Marginal lands whose rents would have been too low to absorb the fall in them that would have been necessary to render their working profitable, will not now come into production ; and the firms which had been mining marginal lands of this kind will go out of production.

The supply of labour to the industry is less than perfectly elastic, and wage rates will be lower.

So also in the case of stores to the industry, their prices will fall. But the supply of the factor stores is likely to be much more elastic than that of labour.

Short-Period Effects.—The plant of the industry had been invested in it on the assumption that it would fetch the normal return of 5 per cent. This plant has been laid down in the industry, and much of it is difficult to disinvest or transform to other uses. Those parts of the gold-mining plant which will fetch

a higher net return in other lines of production, taking costs of transfer into account, than they would do in gold mining, will be transferred to these lines.

While in the short period the supply of gold-bearing land to the industry is perfectly rigid, the supply of labour and of stores also will be to some extent rigid. Hence in the short period these factors, gold-bearing land, plant already in the industry, labour and stores, will share the burden of the tax among them. The more rigid the supply of any one of these factors to the industry and the shorter the period for which its contracts with the gold-mining concerns have still to run when the tax is imposed, the greater will be the share of the burden that the factor bears.

4. Next let us consider the incidence of the present-day tax on South African gold-mining companies.

The tax imposed on South African gold-mining companies at the present day, 1938, is equal to (50 per cent of the company's profits — 5 per cent of its working costs), with a minimum rate on profits of 15 per cent.¹

To recapitulate, we wish to examine the economic effects that would be produced by the imposition of such a tax in an already existing system of economic equilibrium. Following Busschau, the efforts of this can be elucidated by means of mathematics as follows :²

Let total cost of producing x units of output
(gold) = C.

¹ Busschau, *op. cit.* p. 123. The South African Income Tax Law makes allowances in computation of the tax for the estimated annual using-up or exhaustion of capital expenditure on pit-sinking in the case of gold mines with their limited life. No allowance is made for the using-up of the mineral-bearing land. *Ibid.* chap. vi.

² *Ibid.* chap. vi.

Let total receipts from x units of output (gold) = R.

Then total amount of tax = $\frac{1}{2}(R - C) - \frac{1}{20} C$.

\therefore Marginal rate of tax = $\frac{1}{2} \frac{d}{dx}(R - C) - \frac{1}{20} \frac{dC}{dx}$.

\therefore Marginal cost of producing x units of output = $\frac{dC}{dx} + \frac{1}{2} \frac{dR}{dx} - \frac{1}{2} \frac{dC}{dx} - \frac{1}{20} \frac{dC}{dx}$.

Production ceases where

marginal revenue = marginal cost of production,

i.e. where $\frac{dR}{dx} = \frac{1}{2} \frac{dC}{dx} + \frac{1}{2} \frac{dR}{dx} - \frac{1}{20} \frac{dC}{dx}$,

i.e. $\frac{dR}{dx} = \frac{9}{10} \frac{dC}{dx}$ (1)

We are regarding the firm as producing gold. The marginal revenue per unit for this is constant, since

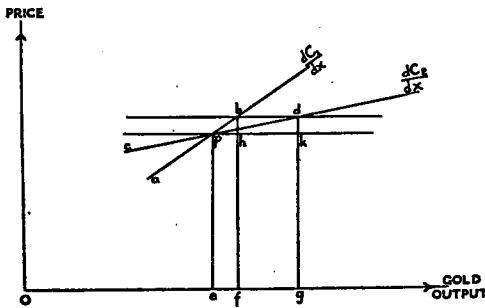


DIAGRAM II

the price of gold does not vary with the output of the firm. The marginal revenue of the firm therefore can be shown as a horizontal straight line phk . (See diagram II.)

The cost of producing gold at the margin must be increasing. Let the curves

$$ab \left(\text{or } \frac{dC_1}{dx} \right) \text{ and } cd \left(\text{or } \frac{dC_2}{dx} \right)$$

represent two possible rates of increasing costs where $C_1(x)$ and $C_2(x)$ are different cost functions. For simplicity the curves are shown in the diagram as straight lines. With no tax in existence the equilibrium output in each case would be Oe .

When the tax comes into existence the equilibrium output is given by equation (1).

Draw a straight line bd parallel to phk and at a distance $\frac{1}{9} pe$ above it, cutting $\frac{dC_1}{dx}$, $\frac{dC_2}{dx}$ at b and d respectively. Erect the perpendiculars bf , dg on to the x -axis.

Then for a marginal cost curve of shape ab , Of is the equilibrium output ;

$$\text{because } bf = hf + \frac{1}{9}hf = \frac{10}{9}hf$$

$$\therefore hf = \frac{9}{10}bf,$$

and equation (1) is satisfied at the point b .

Thus for marginal costs increasing at the rate ab , there results an extension in production equal to ef as a result of the tax.

If the line of marginal costs be rising more slowly, as the line cd , the extension in production brought about by the tax is greater, being eg in the diagram instead of ef . This analysis bears a simple economic interpretation. The greater the amount of ore in the mine, which, on account both of its gold content and its cost of working, it almost pays to mine, then the greater will be the extension in output brought about by the tax. As a result of the tax, each mine will, (in the short period at any rate), extend its production

beyond what it would have been had no tax been imposed. But the amount of increase in production will vary considerably from mine to mine.

5. Before commenting on Busschau's method of analysis, let us attempt an analysis of the case by means of another diagram.

We suppose, as before, that technical coefficients of production for a firm at each scale of output remain unchanged after the tax has been imposed.

The height of the curve of marginal revenue MR, to the firm, is unaltered after the tax has been imposed. (See diagram III.)

Before the tax is imposed let the curves of marginal and of average variable costs to the firm be MVC_1 and AVC_1 respectively; variable costs are here taken to include the cost incurred by the firm on account of the land and labour factors that it hires, but to exclude the cost of capital to the firm. Before the tax the return to the capital factors of the firm was equal to area $ACR = OM.RQ$ in amount. The gold output of the firm was OM units.

Adopting the same terminology as before, let us denote the total of the variable costs incurred by the firm when its output is x units, by $C(x)$, and its total revenue from this output of x units by $R(x)$.

The total amount paid by the firm in taxation

$$= \frac{1}{2}(R - C) - \frac{1}{20} C.$$

\therefore the marginal rate of tax

$$= \frac{1}{2} \left(\frac{dR}{dx} - \frac{dC}{dx} \right) - \frac{1}{20} \frac{dC}{dx}.$$

When output is OD (diagram III), the firm just covers its average variable costs of production and no more. Up to this output, therefore, it gets no

return on its capital and so pays no income tax. After the output OD has been reached, the firm pays income tax on each increment of income that accrues to it over and above its variable costs. On the Ohth increment of output, for example, the firm is getting a return to its fixed factors at the rate ln and pays tax on such return at the rate ml , where

$$ml = \frac{1}{2}nl - \frac{1}{20}lh,$$

corresponding to the equation

$$\text{marginal rate of tax} = \frac{1}{2} \left(\frac{dR}{dx} - \frac{dC}{dx} \right) - \frac{1}{20} \frac{dC}{dx}.$$

Thus the curve of marginal variable costs to the firm immediately after the tax has been imposed, has the shape MVC_2 shown in the diagram.

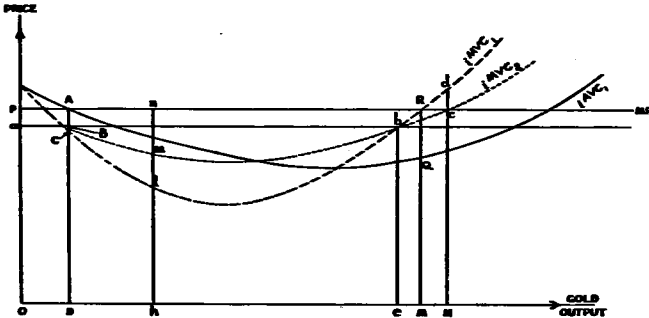


DIAGRAM III

MVC_2 will not intersect the curve of marginal revenue MR in the same point R as does the curve MVC_1 — the point which corresponds to an output OM; because when output is OM the curve MVC_2 will lie at a distance $1/20$ RM below the point R. MVC_2 indeed, will not intersect the horizontal curve of marginal revenue MR until an output ON, greater

than OM has been attained, such that in the diagram

$$\frac{1}{2} cd = \frac{1}{20} Nd$$

that is,

$$cd = \frac{1}{10}(Nc + cd)$$

and

$$cd = \frac{Nc}{9}.$$

Diagram III shows that the firm in question will, immediately after the tax has been imposed, produce on a greater scale than formerly, extending its production beyond its previous level by an amount MN. MN will be greater the more gentle the slope of the curve of marginal variable costs, MVC_1 , to the firm. The units of output between M and N are now produced because their production is subsidised out of Government funds.

We can find out the point at which subsidisation of output by the Government begins, by finding the point after which marginal cost to the firm in the new circumstances falls below the former cost of production.

Marginal variable cost of the x th unit after the tax = former marginal variable cost plus marginal rate of tax

$$= \frac{dC}{dx} + \frac{1}{2} \left(\frac{dR}{dx} - \frac{dC}{dx} \right) - \frac{1}{20} \frac{dC}{dx}$$

This becomes equal to marginal cost of production excluding tax, at the point at which

$$\frac{dC}{dx} = \frac{dC}{dx} + \frac{1}{2} \left(\frac{dR}{dx} - \frac{dC}{dx} \right) - \frac{1}{20} \frac{dC}{dx}$$

i.e. at which

$$\frac{dC}{dx} = \frac{10}{11} \frac{dR}{dx}$$

¹ This will be seen to be the same condition as that stated earlier, of raising the curve of marginal revenue hk in diagram II through one-ninth of its own height, and finding the resultant point of intersection of the curve raised in this way with ab of cd . Diagram III is, in fact, a fuller representation of diagram II.

Through the point a on the y -axis at a height $Oa = 10/11 OP$ draw the horizontal straight line ab to intersect MVC_1 in the point b , corresponding to an output Oe . Until the output Oe is reached the curve MVC_2 lies above MVC_1 ; after the output Oe , MVC_2 lies below MVC_1 . Hence units of output lying between e and N ; when ON is the new output of the firm, are subsidised out of Government revenue; and their cost of production to the firm is less than the cost of the land, labour and stores employed in producing them.

The total amount of subsidy paid to the firm — or perhaps since no money actually changes hands it would be plainer to say “permitted” to it by the Government — is equal to area Rbc .

The total net payment of tax by the firm to the Government is equal to (area BCb - area Rbc).

The total net return to the fixed capital of the firm now, after the tax has been imposed, will be equal to area $ABbc$. This is less than the previous return and less than the return to these factors which had been expected, by the amount (area BCb - area Rbc). The price of gold is fixed: the prices of labour and stores to the industry will bear some part of the burden of the tax. But it will be on the factors land, and capital already invested in the industry, that the burden of the tax will mainly fall. The extent to which, in the case of each gold mine, the loss is borne by the owners of the gold-bearing land, and the extent to which it is borne by the owners of the fixed capital, will, in the short period, if the land and the capital are in separate ownership, depend on the outcome of the bargaining between the two groups of individuals concerned. Hence the outcome is fixed

to within a certain range, but it is not completely determinate.

In the cases of many companies, land and capital will be in the same hands. Then the total loss borne by the owners of the factors will be determinate, and no need will arise to apportion the loss as between the two factors.

Those pieces of capital, which, taking into account the costs of their transfer, would have a higher productivity in other lines of production, will be transferred to such lines.

In the short period immediately following on the imposition of the tax, the effect on the industry will be to extend its output, as typified by the extension MN in the production of the firm in diagram III. *But as plant is transferred to other lines of production, and, more important, as capital in the industry which no longer fetches a normal return in it, is not renewed, and as capital which, in the absence of the tax, would have been laid down, is no longer laid down, then the output of the industry, instead of being extended by the tax, will, in fact, be contracted.*

If the firm whose cost situation is represented in diagram III is going to continue production into the long period, it will have to find some means of lowering the positions of its curves of costs, MVC_1 and MVC_2 , into new positions not shown in the diagram. If it is unable to do this it will go out of production. How can this lowering of costs on the part of the firm come about ?

To see more clearly how this fall in the costs of the firm can come about, *let us temporarily assume that all of the factors except gold-bearing land are in perfectly elastic supply to the industry over the long period.*

Since, in the circumstances we envisage, the price of the commodity that the industry produces cannot alter, nor the prices of the factors other than land, therefore the total burden occasioned by the tax will, in the long period, come to be concentrated entirely on the shoulders of the owners of the gold-bearing land. For the firm whose revenue and cost conditions are depicted in the diagram, if the rent payment which it made initially had been X , say, then finally the rent payment it makes will be $X - (\text{area } BCb - \text{area } Rbc)$. Through this the firm will be able to bring about the fall in its costs of production necessary for it to remain in the industry over the long period — provided that the rent which the firm had originally been paying for the factor gold-bearing land had been great enough for a fall of this amount to take place in it. The rents of some lands would not, in the first instance, have amounted to as much as the fall in them that we name. The mines which would have worked these lands will now, after the tax has been imposed, be unable to get a sufficiently large reduction in their rent payments to enable them to obtain the normal rate of return on the capital involved. The lands will, therefore, remain unworked. In this way the output of the gold-mining industry will be reduced.

To perceive the long-period effects on output and on the rents of lands, let us, as before, distinguish land in the three possible ownerships: (a) land owned by the gold-mining companies themselves; (b) land owned by individuals outside the gold-mining companies; and (c) land owned by the Government.

(a) If the land is owned by the gold-mining company itself, the whole loss of the amount stated falls on the company. If the rent of the gold-bearing

land in the ownership of the firm would not in total have amounted to as much as this loss, then the rent of the gold-bearing land will not be able to absorb the whole loss: the firm will not renew its plant as it wears out and in time will pass out of production.

On this account, therefore, there will in the long period be a diminution in the total output of the industry, a portion of the marginal land in the industry going out of production, which, but for the tax, would have continued to be worked. The entire loss in this first instance (*a*), is borne by the firms already in the industry.

(*b*) Land sold in the market to a gold-mining company with the output ON in diagram III, will fetch a price smaller by the capitalised value of an income equal to (area BC*b* - area R*b*c), than land with the smaller output OM would have done in the absence of the tax. If the selling price of the area of land corresponding to the output ON would originally have been greater than the capitalised value of an income equal to (area BC*b* - area R*b*c), then it will still change hands after the tax, and will eventually come into production. If, however, the selling price of this land would originally have been less than this amount, then the land factor will be unable to absorb the whole loss occasioned by the tax and it will not now come into production.

Thus under heading (*b*) there will again be a certain amount of marginal land which is forced out of production or else never comes into production at all. The entire loss, in this instance (*b*), is placed on the shoulders of those firms outside the gold-mining industry which own the gold-bearing land.

(c) From lands owned by the Government and which it still finds it possible to lease out after the tax, it will gain an increased yield of taxation: but from the land that it leases out in this way the Government will lose an exactly equivalent amount in mining leases.

All those lands employed in the production of ON units of gold, which the Government would have leased out for a rent less than (area BCb - area Rbc), it will now be unable to find people willing to hire. Government revenue from this class of leases will drop to zero. Again, and for this, the third time, there will be a corresponding falling-off in the output of the gold-mining industry.

It follows from what we have said that diagram III does not represent a position of long-period equilibrium for the firm concerned. *Indeed it represents nothing in regard to the incidence of the tax, except the conditions that hold good in a period of time following the imposition of the tax, short enough for all factorial prices to have remained completely unchanged in it.* E.g. the curves MVC_1 and MVC_2 were drawn on the supposition that the cost of land to the firm had remained unchanged after the tax was imposed. Such, we have seen, could not be the case for any length of time. Had it been the case that the price of land to the industry, like the prices of the other factors of production, labour and stores, had been perfectly rigid, then all the firms in the industry would, in the long period, have gone out of production: because the fixed capital of these firms would no longer be able to obtain the normal rate of return.

When the price of land alters, the shape of the curves of cost-excluding-tax to the firm, and the

curves of cost-including-tax to the firm, alter, and assume different shapes from what they had had in diagram III. It was for this reason that we used the subscript i in naming the curves MVC_1 and MVC_2 , respectively. There will in the final position of equilibrium be a different marginal curve of cost-excluding-tax to the firm, of a shape which we may denote, let us say, by MVC_1 ; and a corresponding curve of marginal cost-including-tax, which may be denoted by MVC_2 . (No diagram is drawn.)

The preceding treatment, although it has been arrived at on the basis of several far-reaching assumptions, represents the essential features of the long-period effects of the tax, namely, a fall in the rental values and prices of gold-bearing lands, and a falling-off in the output of the gold-mining industry. Let us now remove some of the assumptions that we made temporarily in the discussion.

Technical coefficients at each scale of output will not remain unaltered. Capital, as a result of the tax, has risen in price: land has fallen in price. Land, labour and stores, therefore, will be substituted for capital in some of its uses.

Labour will not, in fact, over the long period, be in perfectly elastic supply to the industry; its supply will be less than perfectly elastic. Over the long period the output of the industry will be less as a result of the tax, and the quantity of labour employed by the industry will be less, and the wage rate lower. Further substitution of labour for capital will take place on this account.

The price of stores, if their supply is less than perfectly elastic, will also fall; though the fall will be of small amount.

6. If the above theory be correct, then it develops a criticism of the analysis given by Dr. Busschau, both with regard to a proportional income tax and with regard to the present form of income tax on gold mining. Busschau's analysis appears to be an analysis of the short period and not of the long period. Strictly speaking, Busschau's analysis only applies to a period of time that is sufficiently short for the prices of the factors of production to remain unaltered during it.¹ The above analysis would appear to be much more general and more realistic. Moreover, if this be true, the application of Busschau's analysis alone and taken by itself, would be apt to have misleading implications for practice.

7. In the initial section of this chapter, we explained, roughly, the position of the gold-mining industry in South Africa to-day. After that we examined the effects that would be produced by the imposition of a tax on the income of that industry, both in the long and in the short period. From the point of view of choice of tax policy for South Africa, what matters is the set of effects produced in the long period: because we know the present position of the industry; if we know the final position of equilibrium then we know the path of development that the industry will follow: it will be the path connecting the initial with the final position.

Let us suppose that the choice of tax has been narrowed down to one between a flat rate income tax on the industry, and an income tax graduated

¹ At one or two places Busschau partially corrects the short-period nature of his analysis and takes into account the effects of the longer period. See for example the passages "Obviously . . . exploitation", *op. cit.* p. 145; and "Taxation will . . . gold mining", *art. cit.*, *Incorporated Accountants' Journal*, p. 372.

in the fashion of the present tax. Then in order to obtain a portion of that knowledge on the matter which is most essential to the making of a rational decision, the long-period analysis of the taxes that we have given above would require to be employed: and it would be necessary to develop this analysis statistically, in conjunction with geographical and technical information, in such a way as to determine quantitatively which areas would be worked under the one, and which under the other, of the two taxes. Such information, it is suggested, might be prepared by the Government Department of Mining Engineering.

The fact that our analysis given above has taken no account of the expenditure of the proceeds would be no disadvantage from the point of view of trying to arrive at a decision as to which of the two taxes is the better. It is sufficiently true to say that the heights of the two taxes would have to be adjusted in such a way that their yields were the same: and the distribution of the proceeds being the same in each case, would give rise to identical economic effects.

Prima facie, and in the absence of the exact factual information which has been mentioned, economists, we think, must feel a prejudice against the present form of taxation. In it firms are subsidised to produce portions of output which, had there been no tax at all, would have been sub-marginal output and not worth producing. To subsidise some portions of output in this way by the tax, represents a transfer of resources from occupations in which they would get the normal rate of return, to others in which their yield is sub-normal. Most economists will look on such a proceeding with suspicion or abhorrence.

8. Perhaps neither of the two forms of taxation which we have discussed will be the best that it is open to the country to achieve. Certainly in the simplified conditions of affairs in which no uncertainty exists, forms of taxation can be devised which, while collecting the same amount of revenue as either of the two preceding forms, will still do nothing to cut down the output of the industry as each of these two taxes does. We can see how such forms of taxation can be devised in the following way. Let

- L = the rent of any area of gold-bearing land worked by a company,
- R = the gross revenue of the company,
- A = its total costs for labour and stores in earning this gross revenue,
- n = the normal rate of interest,
- K = the amount of capital employed by the firm, and
- T = the tax paid by the firm.

Then $L = R - A - nK - T$.

If we desire to secure maximum production in the industry, then we will wish to adjust the height of the tax so as to secure that any piece of land which would have been worth developing before the tax was imposed will still be worth developing after it has been imposed. That is, we require that when L is just equal to $R - A - nK$, T will be zero. This condition is satisfied, for example, if

$$T = R - A - nK = L.$$

In this case the whole of the rent of the gold-bearing land will be absorbed by the taxation and (theoretically) production will not be curtailed at all.

If T were equal to say, $\frac{2}{3}(R - A - nK)$, then owners of gold-bearing land would still be left with one-third of the rent that the land would have yielded if no tax had been imposed, and the production of gold would not be at all diminished below its level of the no-tax régime.

The tax on the rent-element which we describe, might be "assessed" either on the profits of the gold-mining company concerned, or else on the rent payment that had been made by this company to the owners of the land.

The size of the fraction in the tax formula (two-thirds in the above case) could be adjusted according to the Government's need for revenue and such other criteria as it was desired to take into account. Or a more elaborate tax formula might be used.

III
THE INCIDENCE OF A GENERAL INCOME
TAX

CHAPTER IX

THE CONDITIONS ASSUMED AND THE METHOD TO BE FOLLOWED

1. WHAT do the terms "incidence of taxation" and "effects of taxation" signify in economic analysis? Difficulty over the meaning of these terms has caused a great deal of confusion in some recent discussions, so we will consider the matter the more closely.

Seligman explains his use of the terms thus: "First, a tax may be imposed on some person; secondly, it may be transferred by him to a second person; thirdly, it may be ultimately borne by this second person or transferred to others by whom it is finally assumed. Thus the person who originally pays the tax may not be the one who bears its burden in last instance. The process of the transfer of the tax is known as the *shifting* of the tax, while the settlement of the burden on the ultimate taxpayer is called the *incidence* of the tax. . . . *Incidence* conveys to the mind the notion of the ultimate result of the shifting."¹ "Incidence . . . emerges only when the tax finally settles, or comes to rest, on the person who bears it."²

Again, Seligman says: "By effects of taxation we may mean two things. In the narrower sense, it denotes the immediate consequence of each of the above-mentioned steps [of shifting and incidence,

¹ E. R. A. Seligman, *The Shifting and Incidence of Taxation*, p. 1. (His italics.)

² *Ibid.* p. 2.

that is]. Thus shifting is an effect of impact, incidence is an effect of shifting, and the pressure of the tax is an effect, in turn, of the impact and of the shifting as well as of the incidence. In the wider sense, effect denotes any of the subsequent results of taxation. A tax may have a great many effects. It may diminish industry and impoverish individuals; it may stimulate production and enrich individuals; it may be an unmitigated curse to society; it may be a necessary evil; it may be an unqualified boon to the community regarded as a whole.”¹

When defining “effects”, to speak of the term being used in a narrower and in a broader sense, as in the above passage, certainly seems to be very confusing—nor is any exact distinction drawn between the two. Not only so, but it appears to be impossible, on Seligman’s definition, to draw any definite line of demarcation between the incidence of a tax and an effect of the tax. None the less, he wishes the two, incidence and effects, to be kept separate.

2. The Colwyn Committee also attempted to establish a difference between incidence and effects, though in a different manner from Seligman. For convenience we repeat the passage in full :

“We may explain the meaning which we think it convenient to attach to the term ‘incidence of taxation’. In general usage the term covers not only the initial burden of a tax, but also the whole range of consequential effects. Economists, however, have given it a narrower meaning. For them ‘incidence’ is only concerned with the question on whom

¹ E. R. A. Seligman, *The Shifting and Incidence of Taxation*, pp. 13-14. Seligman explains his meaning in the same sense in “The Effects of Taxation”, *Political Science Quarterly*, 1923, p. 1.

the more immediate burden of the tax as a tax rests. This is the first thing to be decided about any tax. It is to be distinguished from the question of further effects, which may be exceedingly important. For instance, the burden of a tax may rest upon an employer, and in consequence he may cut down his staff; in such a case the effects of the tax may be more serious to the employees than to anyone else, but the incidence of the tax is not said to be upon them.”¹

This definition has already been criticised in Chapter IV above.

Similar, again, is the definition of incidence and effects given by Silverman :

“Under the head of incidence we ask, Who actually bears the money burden of a tax? Under the head of effects we ask, What are the ultimate economic conditions to which a tax gives rise? In studying the practical problems of particular taxes it is sometimes very difficult to separate the two questions, especially as the nature of the incidence may have a considerable bearing on the determination of the ultimate effects. But the distinction has to be made if one wishes to obtain a clear view of the distribution of the money burden of taxation.”²

As a result of the distinction that he draws between the incidence and the effects of a tax, Silverman is led to devote separate chapters of his book to a discussion of the incidence of the income tax and the effects of the income tax respectively. If, however, as we suggest is the case in Silverman’s definition above, the distinction between incidence and effects

¹ *Report*, p. 106.

² H. A. Silverman, *Taxation, Its Incidence and Effects*, p. 89.

is vaguely drawn, this diminishes the clarity and the value of such a discussion.

3. On the other hand, in a passage of which one sentence is often quoted, but which deserves to be repeated at greater length, Cannan has suggested that the term incidence of taxation should be cast overboard altogether, and only the effects of taxation spoken about in the theory of Public Finance :

“ If the price of wheat goes up owing to a bad season, we do not discuss the incidence of the addition to the price caused by the bad season. But if the cost of sewage disposal is raised . . . or if a frontier war brings about an increase of the tax on beer, we immediately find ourselves engaged in foggy discussions about incidence. One friend has suggested that the reason why we discuss the incidence of taxes, and not the incidence of any other kind of expense, is that, as taxes can be more easily altered by public authority than any other expenses, the question of their incidence is of more practical interest than the question of the incidence of a wet August or an earthquake, and that the appropriation of a special term for use in connection with taxes is the result of the greater practical interest. Another says that the reason is that the rain falls alike on the just and the unjust, but that legislators intend taxes to fall on certain classes of persons, and, as a matter of fact, they always fall on other classes.

“ However this may be, I have no doubt that it is desirable to eschew the use of the term ‘ incidence ’ of taxation. It unduly restricts inquiries into the justice and expediency of taxes, since it is always held that the ‘ real incidence ’ of a tax is upon the persons who ultimately pay or provide the money for

the tax. But . . . persons who pay a tax are often less injured by its imposition than those who pay no portion of it. The man who goes two miles out of his way daily to avoid a bridge toll would be more benefited by the freeing of the bridge than most of those who pay the toll. It is, therefore, far better to consider the *effects* of taxation. By using this more general term, we shall find it easier to avoid the usual mistake of supposing that taxes are subject to an economics of their own, instead of having effects just like any other expense. We shall also be less likely to lose our way by attempting to travel by short cuts.”¹

No amount of argument can turn aside the point of Cannan's ridicule: the word incidence is useless and pretentious: worse, the evidence suggests that it frequently causes confusion of thought. The most that may be pled in its favour is that it has been in general use among economists, at least from the time of Adam Smith till the present day. On this ground — which is perhaps insufficient, and perhaps the title of this book really ought to have been, “The Effects of Income Taxes” — we will retain the word incidence in addition to the word effects. Yet our usage of the term will be almost tantamount to the adoption of Cannan's proposal; because we will use the term incidence to refer simply to the group or genus of effects of taxation.

The incidence of a tax is the group of economic effects which it brings into existence. These economic effects will mainly consist of alterations in commodity

¹ *Memoranda relating chiefly to the Classification and Incidence of Imperial and Local Taxation, of the Royal Commission on Taxation, 1899, p. 166.*

prices and in the flows of commodities per unit of time; in alterations in factorial prices and in the flows of the factors of production into the production process: the economic effects (and therefore the incidence) will consist also of changes in revenue and cost schedules of firms, and in changes in the distribution of wealth brought about by the tax. The theory of incidence is concerned with all of these topics.¹

4. It may have been gathered from the previous chapters, that the element of time is going to play an important part in the discussion. In their theorising on the topic of incidence, the classical school of economists in England concerned themselves only with the long period of time. It was for the most part, indeed, with the long period of time that they were concerned in their other branches of theorising as well. Bastable, who himself followed the same tradition, points out that "The orthodox theory of incidence professes to explain what will happen in the long run". He continues, "'But taxes', as Leslie, well remarks, 'are paid immediately under the real conditions of life and out of the actual wages and profits or other funds of individuals, not out of hypotheses or abstractions in the minds of economists'".²

The usage of Marshall and Edgeworth, however, is more general than that of the classical school. They use the words "incidence", "burden" and "weight" of a tax, to refer to the effects produced by the tax

¹ This view of the meaning of incidence agrees with the usage of Marshall and Edgeworth. Edgeworth says at the beginning of his paper on Urban Rates, "Incidence here denotes all those effects of taxation with which the economist is concerned" (*Papers*, vol. ii, p. 151).

² *Public Finance*, 3rd edition, pp. 367-8.

after the lapse of periods of time of different lengths ; the incidence of a tax will of course in this case vary according to the length of time allowed to elapse after it has been imposed. These authors sometimes discuss the incidence of a tax in the long period of time, and in other places they discuss its incidence after the lapse of a short period of given length.¹ It is this usage which we will endeavour to follow in this book.

5. The problem in the theory of incidence to which we will address ourselves, is one in which there are a large number of economic variables ; and the method *par excellence* for the solution of such problems, is general equilibrium analysis of the type of the school of Lausanne. In this type of analysis, the related movements in all of the variables dealt with are shown ; and full account is taken of the effect that each variable exerts on the others during the process of change. The partial equilibrium method of Marshall, on the other hand, proceeds on the assumption that only one variable alters at a time, while the others are supposed to remain constant, being impounded in *ceteris paribus*. When a number of variables of the same order of importance are in question, the Marshallian method is, by comparison, very inferior.

Yet, in the present instance, we are, out of limitations of intellect, driven back from application of

¹ Marshall, *Principles*, pp. 414-15 and Appendix G. See also his "Memorandum on the Classification and Incidence of Imperial and Local Taxes", 1897, *Official Papers by Alfred Marshall*, p. 327.

Edgeworth's treatment of the time element is more explicitly rigorous than that of Marshall. The reader who will mark each reference to the period of time, given by Edgeworth in the first twenty-five pages of his "The Pure Theory of Taxation" (*Papers*, vol. ii), will, I think, find the number very striking.

general equilibrium methods. An attempt to use these methods in the case of this problem, it is true, was made by Sensini, who applied mathematical methods to trace the effects of a general income tax.¹ Despite the care and brilliance with which he applied the technique, the outcome of the investigation was, even in the author's own estimation, of little positive value. In the first instance, the simplifying assumptions underlying his treatment were altogether too drastic: the firms were assumed to have no overhead expenses and to have fixed coefficients of production: it was assumed that no use was made of the proceeds collected by the tax. Then there was the further difficulty, as he pointed out, that the solution of the very great number of simultaneous equations that the Lausanne method yields, is not as a rule possible.

In these circumstances, for a solution of the problem of the incidence of the income tax, we are impelled to the use of the methods of partial equilibrium analysis, in which we suppose things to vary one at a time. However defective the logic of the method as compared with that of Lausanne, experience of it has shown it to be often the more suitable method for obtaining information about the real world. At the same time the realisation of the interdependence of variables that the Lausanne method gives, assists the mind in an indirect way to the solution of the problem, even when application is being made of the methods of partial equilibrium.²

6. At the conclusion of this section of the book

¹ Sensini, "Le equazioni dell' equilibrio nell' ipotesi di sottrazione di ricchezza operate dal governo su determinati individui della collettività", *Giornale degli Economisti*, 1930.

² See Ricci, "Pareto and Pure Economics", *Review of Economic Studies*, Oct. 1933.

we will consider the economics of a developing community such as Great Britain, and the effects that an income tax will produce in it. But for the next few chapters we will be concerned only with the very simplest type of community.

We picture our community as being, to begin with, in a condition of complete, stationary equilibrium. All tendencies to change have worked themselves out ; there are, year in, year out, the same flows of goods from the productive processes at the same prices. And it will be a closed market, carrying out no transactions with countries outside itself.

In this stationary community we assume that there already exists a tax system which includes a general income tax — general in so far as it affects income drawn from all of the industries and professions in the community. This income tax may be either proportional or progressive. *And we suppose that a very small increase takes place in the rate of this income tax, while the existing complex of other taxes is kept unchanged.* The rise in the rate of the tax need not be uniform as between all sizes of income. The rise in rate for an income of £1000 a year may be by 2d. in the £ : the rise in rate for an income of £10,000 a year may be by, say, 4d. in the £ ; while some sizes of income may be unaffected by the tax. Why we should imagine a small change of this kind to be introduced, and not a large one, we will discuss presently.

From this small change in the height of the income tax, a series of economic effects will follow. We will take it for granted that the change brought about in each variable gradually works itself out to a state of equilibrium ; so that eventually the community will

again attain a condition of stationariness similar to that from which it started out. And our inquiry will be: What is the size of population? What the volume of capital? What the volume of goods produced and the exchange ratios between them? and, What is the level of real wages? in the new situation as compared with the old. *When we have shown the level that each of these things will attain in the new state of affairs as compared with what it had been in the old, we will have shown the economic effects of the rise in the income tax.* The method employed, that is, is to be that of comparative statics.

The procedure we follow may be described, in general terms, as the method of Marshall and of the English classical economists. Assumptions it makes will be that there are no wasting natural resources in the community; that population gradually works itself out to a stable level as the state of stationary equilibrium is approached; that the system of wants, or scale of preferences of each individual, gradually works itself out to a stable configuration as the stationary state is approached; while knowledge of technique remains unaltered once the stationary condition of things has been attained.

The breadth, as well as the narrowness of the method, deserves comment: because, although once the state of stationary equilibrium has been attained, each person's scale of preferences remains unaltered, yet, in moving from one state of equilibrium to another, his scale of preferences may change. When the initial spell of stationariness, for example, is broken, a person may for the first time consume new commodities which in the old conditions he had never tasted; should he find the actual utility of

these goods greater than he had anticipated, he may become a consumer of them in the future.

The foregoing is an instance of a change in the individual's scale of preferences as between one stationary state and another. It also furnishes an example of a case in which it would be true to say that knowledge has altered as between the two sets of circumstances: the individual's knowledge of consumption goods was altering in the process pointed out. When we open the door to the possibility of such changes taking place from the side of consumption, we see the possibility of invention and technological change to come in also; because if we grant that the individual may rearrange his consumption in experimental ways, it will presumably likewise be open to a manufacturer to rearrange his production methods. After a period of transition from one stationary state to another, a manufacturer, through the experimentation that had been forced upon him by the changing industrial structure, might choose to employ in the second condition of affairs, even though factorial and commodity prices were the same as before, a different arrangement of productive resources from what he would have done in the first instance. Thus a theory of comparative statics, worked on a Marshallian pattern, appears to include the possibility of technological change, another name for which is invention or development in the state of the arts. The change in knowledge and technology, however, that takes place during this process of transition, need not be a positive one and in the direction of progress: it may also take the form of a forgetting, of processes, for example, and be in the direction of technical retrogression. Change of know-

ledge in either direction, therefore, is possible between one state of stationary equilibrium and another; though none is possible once a condition of stationary equilibrium has been attained.

The method we follow, indeed, will be in some ways (*viz.* with regard to uncertainty and changing wealth structure), more general than that of the school of Lausanne. The method of Lausanne would envisage, when a tax was imposed, a jump made instantaneously from the initial point of equilibrium to the final position; or at least the process of transition from the initial to the final stage would be disregarded. No cognisance would be taken by it of the changing wealth or changing tastes of the members of the community: nor regard paid to the chance losses and chance gains that would inevitably arise during any such process of transition.

The method which we follow, on the other hand, does trace price changes throughout time: it is an economics of the transition process as well as of the initial and final stages of equilibrium; and it takes into account the uncertainty that would be expected to arise during the transition process.

7. The industries in the community which we envisage, are taken to be working under conditions of perfect competition. By this we mean that

- (a) the demand for the commodity supplied by each firm is infinitely elastic, and
- (b) each firm places only a negligibly small portion of the total production of the commodity on the market.

Knowledge of prices in the market, whether of buyers or of sellers, we may be permitted to repeat,

is not assumed to be perfect. When stationary conditions have emerged — *i.e.* both initially and finally — the knowledge of each individual relating to prices is taken to be stationary, though not necessarily, even then, perfect.

The industries in the community are supposed to be sufficiently large for some of them to employ appreciable fractions of the total supply of certain of the factors of production. An expansion or contraction of such industries, therefore, influences the prices of these factors.

Once these conditions have been hypothesised, *the key to the solution of the problem of the incidence of the income tax would appear to lie in an analysis of:*

- (a) *changes introduced into demand schedules by the income tax, together with*
- (b) *changes brought about in the supplies of the factors of production, when this analysis is taken in conjunction with the theorem which we have established on pp. 16-18 supra.*

8. One of the assumptions we have made still remains to be discussed. It may be found puzzling that the change in the height of the income tax is to be supposed a small and not a large one; in contrast with our discussion of partial income taxes, where no restriction of this kind was imposed. Yet good cause exists, I believe, for this step.¹ If the rate of income tax were to be increased suddenly by 5s. or 10s. in the £, we would have very little conception of the effects that might follow: whereas if it were to be raised by 3d. or 6d. in the £, we probably do believe

¹ Einaudi, "Osservazioni critiche . . ." *cit.*, reasons on the basis of a small change introduced in the height of a general income tax.

ourselves to have at least some rough idea of the results which would be produced. The supposition we employ, therefore, enables us to make fuller use of our existing knowledge.

Again, for the individual the economic problem usually presents itself in some such guise as, Should I alter my output of effort by a small quantity? or, Should I introduce some small change into my existing plan of consumption? Similarly, for a Government the practical problem usually is to increase or reduce the level of income tax or of death duties by a *small* amount. It is really of greater practical importance to know the effect of reducing the income tax from a level of 5s. to 4s. 6d. than to know what would happen in the event of a sudden and drastic reduction in the tax to 3s., 2s. or zero. Of course, if it should be found possible to discover the effects of a sudden reduction in the tax to 2s. or zero, as well as the effect of a small reduction, then so much the better. But this type of knowledge appears to lie outside our reach.

The practical problem of altering the income tax of any country, of reducing it from 5s. to 3s. or 2s. on the one hand, or raising it to 6s. or 7s. 6d. on the other, relates to an alteration of the level of the tax to either of these heights, achieved as a result of a gradual process of change extending over a number of years; and on this, the really vital practical problem, the theory which we develop is calculated to throw light. Because, in so far as our theory is successful, we will have found it possible to get an account of the effects produced by a *small* change in the income tax. We will then be able to assess the effects that would be produced by a comparatively large change in the

rate of income tax, which had been brought about by a series of alterations during a period of time, as the sum of the changes resulting from each of the individual small changes out of which it had been compounded.

Here a possible difficulty would be, that while the earlier small changes which were made might produce certain definite effects, the succeeding small changes, going to complete the large change, say a large rise, in the height of the income tax, might produce effects of a different, perhaps a contrary, kind. Though this is a possible difficulty, it is one which does not appear to arise in our discussion of the effects of an income tax which is introduced into a stationary community. If, however, the community we are dealing with is a progressive one, when we examine the changes which would be introduced by a succession of small increments of income tax, we will find that it may be the case that, while over a portion of the range of variation of the tax each increment gives rise to one kind of effect, after a tax of a certain height has been reached, the succeeding increments produce effects which are, in part, of an opposite nature.¹

¹ Chapter XVI, Section II.

CHAPTER X

ON THE DISREGARD OF THE EXPENDITURE OF THE TAX PROCEEDS IN THE THEORY OF INCIDENCE

1. IF ten million pounds, say, be collected by a Government in taxation, this sum is not only collected but is disbursed in the expenditure that the State makes on social services, payment of interest on the national debt and in other ways. There is, therefore, a double aspect of every tax: collection of the tax on one hand, which inflicts a burden on the taxpayers, and disbursement of the proceeds on the other. *Prima facie* there is no reason to expect that one of these aspects, in the economic effects it produces, should be more important than the other. Yet, by a certain one-sidedness of economic reasoning in discussions of the subject — save for rare exceptions — only one of these aspects, that connected with collection of the tax proceeds, has received consideration in the theory of incidence.

Let us suppose that a new tax is levied additional to the existing body of taxes; say a tax of £1 per unit on the manufacture of a certain commodity. From the side of costs the effect produced by this will be perfectly determinate and important — an increase in cost of production by £1 per unit.

The revenue produced by the tax, amounting, let us suppose, to half a million pounds, is spent by the Government, possibly on poor relief or on the navy.

But when the revenue is spent in this way it will produce as a rule no appreciable effect either on the cost of production of the commodity (which has already been increased by £1 per unit) or on the demand for the commodity. Here, therefore, the effects produced by expenditure of the tax proceeds on the industry originally concerned, are small ; and the classical type of analysis might be deemed to give a sufficiently accurate account of the effects produced in this industry. Effects would be produced outside the industry, however, to which the classical analysis would direct no attention.

This illustrates the most probable occurrence when a tax is levied on the manufacture of a commodity : the expenditure of the proceeds of the tax will be thinly spread over a wide field, and the effects which this expenditure produces on the industry on which the tax had originally been imposed, will be small in comparison with the effects which the tax produces on the costs of the industry. It is wrong, however, even in an instance of this sort, not to point out that effects will be produced by the expenditure of the revenue which has been raised by means of the tax, both in this and in outside industries. These effects will be the more important, the larger the total revenue which the Government collects by means of the tax.

Suppose, again, that in the example we have chosen, the tax has been levied on the manufacture of steel, and the revenue from it used to finance new naval building. The expenditure of the proceeds will increase the demand for steel ; and this reaction will require to be taken into account in assessing the incidence of the tax on the steel industry itself.

Or, if a tax be levied on petrol and its proceeds used to improve the state of the roads,¹ economic reactions on the price of petrol and on the quantity of it sold, might be no less important from the side of demand than from that of supply, the improved roads stimulating an increase in the number of car users. The traditional theory of incidence, neglecting expenditure of the proceeds, would fall seriously short of adequacy in a case like this, even in regard to the industry on which the tax had been imposed; and its neglect of effects produced in the outside industries still remains unsatisfactory, as it had been in the previous instance.

The temptation to disregard effects produced by the expenditure of the tax proceeds will be greatest when this expenditure is spread thinly over a wide field. But what if the tax itself is one that is levied not on a commodity but on income or inheritance, so acting over a wide field? The economic effects produced from the side of costs are themselves not concentrated on one section of producers: they are spread over the whole of industry. If it had been permissible in this case to disregard the expenditure of the tax proceeds, then, no less so, it would have been permissible to disregard the collection of the tax and the effects it produces from the side of costs — the economic effects in both cases being equally widely diffused.

These examples illustrate the principle that if the imposition of a tax gives rise to an increase in govern-

¹ This example is given by Kendrick, "Public Expenditure, a Neglected Consideration in Tax Incidence Theory", *American Economic Review*, 1930. See also Fagan, "Tax Shifting and the Laws of Cost", *Quarterly Journal of Economics*, August 1933.

mental revenue, then the economic effects produced when this revenue is spent, ought to be taken into account in investigating the incidence of the tax. (See Wicksell's rule mentioned later.)

2. At some points in their writings Edgeworth and Marshall both allude to the expenditure of its proceeds when considering the incidence of a tax. Edgeworth, for example, refers to it when he is considering a tax on house rent. He says: "Rates on houses when expended in improving the neighbourhood tend to increase the demand for houses. *Yet in measuring the burden of the tax to the owner it is allowable in pure theory to abstract its influence on demand.*"¹ Doctrine is allowed to retain its incomplete classical form. Again he refers to the matter in connection with an income tax: "In so far as it [the income tax] strikes those who are entitled to a fixed payment from the proceeds of a going concern, it affects economic margins only in so far as the reduction of income may cause an alteration in the consumer's scale of demand".² But Edgeworth did not develop these allusions.

Marshall's awareness of the problem is made clear in his discussion of the incidence of local rates. He distinguishes two classes of such rates: "*Onerous* rates are those which yield no compensating benefit to the persons who pay them. . . . On the other hand *beneficial* or *remunerative* rates are those spent on lighting, draining and other purposes; so as to supply the people who pay the rates with certain necessities, comforts and luxuries of life, which can be provided by the local authority more cheaply than

¹ *Papers relating to Political Economy*, vol. ii, p. 70. My italics.

² *Ibid.* p. 76.

in any other way. Such rates, ably and honestly administered, may confer a net benefit on those who pay them; and an increase in them may attract population and industry instead of repelling it.”¹ Again, when he is considering the incidence of export and import duties, Marshall takes into account the manner in which the Government spends the revenues which they fetch.²

Bastable felt perturbed at the limitations of the current doctrine of incidence. It is, he says, a development of the Ricardian doctrine: it starts out from certain “unduly simplified” assumptions such as mobility of capital and labour, and on the basis of these seeks to determine what the long-run tendency to shifting will be. What the theory of incidence, and indeed of public finance as a whole, is aiming to do, however, is to illumine the facts of everyday life in the departments of which it treats; its real intention is to show *all* the implications of any change that is introduced in the conditions assumed, *e.g.* through the introduction of a new tax. And in this respect “a doctrine of incidence that is confined to the receipt of income without regard to its expenditure is so far defective”.³ But while Bastable and other writers might regret its existence, they did not feel equal to the accomplishment of the difficult task of filling in this gap in the theory which had been left by Ricardo, Marshall, Edgeworth and the other “tool makers”.

Hobson stated the problem we are dealing with in

¹ *Principles*, Appendix G, p. 794. See also “Memorandum on the Classification and Incidence of Imperial and Local Taxes”, *Official Papers by Alfred Marshall*.

² *Money, Credit and Commerce*, Bk. III, chap. viii.

³ *Public Finance*, 3rd edition, p. 367.

a way which brought out both its economic and its moral importance. He says about a tax on "surplus income" (surplus income being income that a person receives over and above that minimum income for which he would just be willing to provide his present output of effort): "Even if the taxation . . . did imply a reduction in the rate at which new industrial capital, private or public, was created, this is no condemnation of the policy. Labour and ability are even more important factors of production than capital, and any improvement in their efficiency may be cheaply purchased by some diminution in the growth of industrial capital. Public expenditure on health and education, in particular, will, wisely directed, add immensely to the future productivity of the nation. . . . Hitherto too much of the national surplus has been put into increasing the capital structure, too little into improving the physical and intellectual calibre of the people."¹

In his evidence before the Colwyn Committee he said: "The general long-range effects of taxation upon trade largely hinge upon the uses made by the State of the tax revenue. When used productively and economically for health, education, etc., the revenue may be regarded as income earned by the State and needed for her performance of economic services.

"The State is a Factor of Production."²

Stamp made one or two interesting extensions to the existing theory in his *Fundamental Principles of Taxation* (1921). Not all the consumption of the wage-earner, he shows, goes to increase his efficiency; and if his expenditure, *e.g.* on beer and tobacco, can

¹ *Taxation in the New State*, 1919, p. 69. See also pp. 72-4.

² Paragraph 20 of his evidence-in-chief, *Minutes of Evidence*, p. 119.

be cut down by taxes placed on these commodities, his efficiency may be unimpaired. "The efficiency *given* by the direct expenditure of the community may equal or exceed the efficiency *taken away* by the tax. Suppose school feeding were paid for by imposing a sugar tax — the net effect on the health of the family might not be adverse, if the detriment caused by depriving the children of some sugar was more than made good by the benefit from the food provided.

"In so far as collective spending is wiser than individual spending, a tax may increase efficiency, and therefore not be thrown off. While so great a proportion, on the average, as one-sixth to one-fifth of a worker's income is spent in beer, it is idle to talk about taxation being thrown off because efficiency is reduced. This could only be the case if the worker insisted on having an unreduced quantity of beer, and the *extra* expenditure thereon, caused by the tax, curtailed other items of the household budget."¹

In dealing with the effect of Death Duties on accumulation, Stamp points out that if death duties or any other tax could be reduced in height, other things remaining the same, people would be able to save more. "But, of course, all other things would *not* be equal, and the cessation of Government expenditure might so adversely affect the possibilities of effective saving, that accumulation of capital wealth would be actually retarded. A potent factor in successful accumulation and maintenance of capital is the setting aside of part of individual funds for collective use."²

His conclusions take into account the expenditure of the proceeds of the duties. They are :

¹ *Op. cit.* p. 75.

² *Ibid.* p. 144.

“(1) Apart from other economic effects of death duties, even current expenditure of the proceeds is likely to add to the nation’s power of accumulation more than the actual *capital* it takes from individuals.

“(2) *Immediate effect on realised savings.* (a) In so far as Government expenditure is in permanent works or reduction of debt there is only a transfer of capital. (b) If it is not so spent, savings may be ‘wasted’, but if the money had been raised by other taxes, potential saving might have been ‘wasted’ to just the same extent, and no special disadvantage attaches to death duties.

“(3) *Ultimate effect on stimulus to saving.* Owing to powerful countervailing considerations, the net effect is only slightly against the death duties as compared with other taxes.”¹

We have already dealt in some detail with the treatment given to this aspect of the problem by Mr. Coates and by the Colwyn Committee.

Seligman, when he is considering the incidence of income taxes, gives some account of the effects produced by the expenditure of the proceeds of the taxes.²

3. On the Continent, writers were earlier aware that consideration of expenditure of the proceeds of a tax constituted a definite problem for the theory of tax incidence. Credit for having been first to see the issues involved, and for having seen them clearly, belongs to Wicksell.³ There are, he showed, two distinct and separate questions that may be asked.

¹ *Ibid.* p. 155.

² *Art. cit.* Section V. See also “Taxation and Prices”, *Studies in Public Finance*, p. 90 f.

³ Wicksell, *Finanztheoretische Untersuchungen*, 1896, p. 6. See also Einaudi’s review article on the appearance of the Italian translation of the book, *Riforma-Sociale*, July-August 1934.

If it is a question of levying either one tax or another tax, each with the same yield, public expenditure will be left unchanged whichever is levied; and in this case we may logically inquire what the economic effects of either tax will be, irrespective of how the tax proceeds are expended. If the problem we are dealing with is of this kind, then the type of discussion given by the classical school is the logical one, and the expenditure of the tax proceeds can be disregarded.

If, alternatively, the problem we are dealing with is one where, if a tax be imposed (remitted), at the same time the expenditure of the State will be increased (reduced) by an amount equal to the yield of the tax, then in this case our treatment of incidence must take the expenditure of the tax proceeds into account.

When we are trying to assess the effect of an increase or reduction in the income tax, or in the height of any one of the existing complex of taxes, in such a way as to produce an alteration in the level of public expenditure, it is on this broader type of inquiry, and not on the preceding narrower type, that we must embark.

Since there are these two separate types of investigation the word incidence may possess either of two distinct meanings; and it behoves any author to make clear in which sense he uses it. In this book we use it in the broader sense so as to include under it effects brought about by the expenditure of the tax proceeds.

4. Although Wicksell's words bore no fruit in Anglo-Saxon literature, their importance was better understood by the Italian writers. Einaudi, De Viti

and others discussed the incidence of taxes in such a way as to take into account the effects produced by the expenditure, as well as the collection, of the tax proceeds.

Barone, for example, anticipates Hobson in an interesting fashion — though, it is true, he does so while discussing the distribution of taxation and not its incidence. He points out that if our object should be to maximise average income per head of population, it does not follow that we should strive to

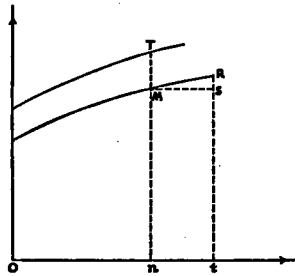


DIAGRAM I

maximise the volume of national savings. “The increase in average income does not depend only on the increase in savings, but also on the improved productive qualities of the labourer. It is possible, keeping the productive qualities of the labourers unchanged, to *provide them with* a greater quantity of savings, in which case a certain increase in average income will result: it is possible to *invest* a quantity of savings in improvement of the labourer, and notwithstanding that they are then assisted by a lesser volume of savings, to have a more rapid increase in average income. Suppose we start from the situation M in the diagram. An increase in savings nt , the

productive qualities of labour remaining the same, will give an increase RS in average size of income. If the increment of savings *nt*, instead of being used *along with* the labour, is invested *in* the labour to improve its productive qualities, there will be an increase in average income by MT, which may be even greater than RS.”¹

Einaudi, when trying to assess the effects produced by an income tax, was at some pains to take into account the expenditure of the proceeds of the tax, but in a way which is not easy to summarise.²

Nevertheless it was only with the appearance of the 1928 edition of De Viti's *I Primi Principii dell' Economia Finanziaria* that the expenditure of the tax proceeds began to be worked into discussions of incidence in a definite and systematic way. De Viti's work, from which we quoted earlier some of the most important passages, has proved of enormous stimulus to writers in Public Finance. A majority of the Italian writers now accept a view similar to his; and as a result this aspect of the theory has been further elaborated and systematised.

In this book we accept and apply the thesis of De Viti, which we believe to be thoroughly scientific. Further analytical examination of the topic, however, appears to fall within the other branch of the theory of taxation, the Theory of the Distribution of Taxation, rather than within the Theory of Incidence. Since we hope to treat this in another book, discussion of the topic will not be carried further here.

¹ *Le Opere Economiche*, vol. iii, pp. 160-61.

² “ Osservazione critiche . . . ”, *cit.* Einaudi gives an important bibliographical note in “ Contributo alla ricerca dell' ‘ Ottima Imposta ’ ”, *Annali di Economia*, 1929, pp. 78-81. See also his Introduction to De Viti's *First Principles of Public Finance*, p. 29.

CHAPTER XI

THE EFFECT OF THE INCOME TAX IN DIRECT ALTERATION OF DEMAND SCHEDULES

1. WE take it for granted¹ that it can be shown by the theory of Distribution of Taxation, that the Government of the community will spend the money collected from the increment in the income tax which has been imposed, on determinate objects, such as defence, justice, etc.; and that the quantity of money spent on each one of these objects will itself be determinate.

In this chapter it becomes desirable to distinguish the two different forms which may be taken by governmental expenditure financed by the tax. Firstly the Government may provide certain additional services, for example medical and health services. The people will not consume these services in accordance with the same principle as they will, say, butter, sugar or the other commodities which they purchase in the market. The amount of their consumption of Government services will not follow the familiar lines of equating marginal utility to price, but will be in accordance with some other criterion. Goods and services which are supplied by the Government are referred to as *indivisible* goods.

On the other hand, the Government may distribute part of the proceeds of the income tax in the form of

¹ We make this assumption although some of the questions which it raises are difficult.

old-age pensions, for example, or in payment of sickness benefits to workmen. The recipients of the money in cases of this type will use it to purchase food, clothing and other *divisible* goods in the manner described by marginal utility analysis.

When the revenue of the Government is increased through an increase in the height of the income tax or from any other cause, the presumption is that part of the increased revenue will be used to finance a larger volume of services of the indivisible type, and part will be used in payment of money benefits to its dependants, so increasing their consumption of divisible goods. This would represent the normal occurrence to be expected from theory. The case in which only the consumption of indivisible goods and services was increased, or the opposite case in which only the consumption of divisible goods was increased and that of indivisible goods was left unaltered, would be exceptional. We will assume that we are dealing with the normal case, that in which the proceeds of the tax are used to finance an increased consumption both of divisible and of indivisible goods, on the part of the members of the community.

2. A theorem in economics. How the consumption pattern of the individual alters when his income alters.

It will be a familiar matter to the reader that the individual, when he attains equilibrium in the pattern of his consumption expenditure, derives the same utility from the last unit of expenditure, *e.g.* the last penny, that he devotes to each commodity which he purchases. Only when he does so, does he derive the maximum utility from his expenditure. If the income,

of the individual increases, therefore, while the prices of commodities remain unaltered, he will increase his consumption of each commodity until this equation again holds good.

A very concise analysis of this case, showing how the consumption of an individual alters when his income either increases or diminishes, while the prices of goods remain unaltered, has been given by Hicks and Allen;¹ and for convenience we will reproduce

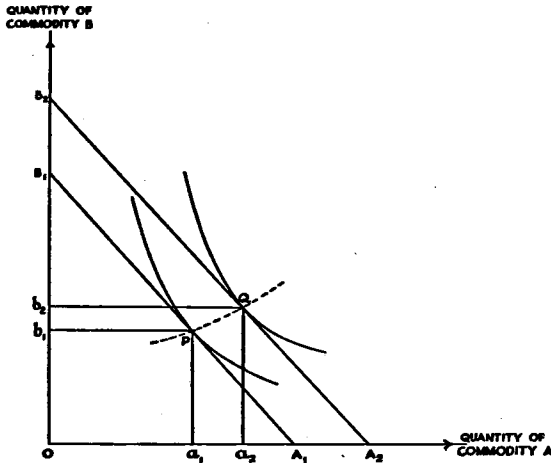


DIAGRAM I

it here. Let us suppose, to begin with, that there are only two commodities, A and B; and draw the indifference curve diagram of the individual for his consumption of these commodities. (See diagram I.) These indifference curves, so long as no uncertainty exists, will remain unaltered in position.

¹ "A Reconsideration of the Theory of Value", *Economica*, 1934; and for a fuller explanation of some parts of this section see Allen and Bowley, *Family Expenditure*, p. 97 f.

In the initial state of equilibrium, let us suppose, the income of the individual would be just sufficient to purchase either a total quantity OA_1 of the commodity A, or else a total quantity OB_1 of the commodity B. Then it can be shown that all possibilities of exchange open to the individual are given by co-ordinates of points on the line A_1B_1 . He will achieve the most desired consumption of commodities by choosing that point on the line A_1B_1 which lies on a higher indifference curve than any other: *i.e.* he will come to equilibrium at the point at which A_1B_1 becomes a tangent to one of his system of indifference curves, the point P with co-ordinates (Oa_1, Ob_1) in the diagram.

Suppose, now, that the individual's income is increased, so that he would be able to purchase an amount OA_2 of commodity A and none of commodity B, or else an amount OB_2 of B and none of A. In the same way as before, it can be shown that if the prices of A and B remain constant, the individual will now purchase Oa_2 of A together with Ob_2 of B. In general, the equilibrium combination of commodities for the individual, as his total income either increases or decreases, will be given by the co-ordinates of points on the curve PQ.

The case where the individual purchases more than two commodities can be dealt with in a similar way, by supposing the diagram to be extended into n dimensions if there are n commodities; or dealt with on the same principle, by an algebraic treatment instead of a purely geometrical one.

If uncertainty exists (and it is this more general case which the theory of the income tax which we give, attempts to cover), the foregoing diagram will

only apply at one particular instant of time. The shape of the indifference curves will be altering from moment to moment; and the shape of the curve PQ will, therefore, also alter from moment to moment. If a time axis be added to diagram I in addition to the axes OA, OB, the diagram will then show the variation in the individual's consumption of the commodities through time.

It would still be possible to go behind any diagram which was drawn, and explain, in more general terms, the phenomena which it represented. Part of the explanation would show how the individual, when his income circumstances alter, must feel uncertain as to the proportions in which he can best combine A, B and other commodities in his consumption pattern. Only after a period of experimentation in which he consumes these commodities in varying proportions, will he come to feel assured that the combination which he does consume is the optimum one.

3. The influence of the income tax in altering the consumption of divisible goods and the demand schedules for them in the short period.

Part of the proceeds which the Government collects from the income tax it disburses to the poorer sections of the community, as, for example, in old-age and other pensions. The people whose incomes are increased in this way will, therefore, increase their consumption of the various commodities, after the fashion which we have explained analytically in the preceding paragraph. Or, if we look at the changes which the increased governmental expenditure brings about in the short period in a more concrete way, we will envisage the beneficiaries of the governmental

expenditure as increasing their consumption of actual commodities, cotton shirts, pork, wheat, milk, housing and the other commodities which are usually consumed by the working classes. We should also expect to find an improvement in the grades of food, clothes and housing which these classes consume.

At the other end of the income scale, among the richer persons on whom the payment of the tax rests, we should expect to find a falling-off in the consumption of the commodities which they customarily consume. There would be, presumably, a falling off in the demand for country houses, expensive flats, boxes at the theatre, yachts, the more expensive kinds of food and wines, and so on. Perhaps, instead of going to the Riviera, to take a colloquial example, and hunting and shooting, all in one year, certain of these people would now hunt one year, in the next go to the Riviera, and shoot in the next again. If this were the case, the falling-off in demand would be to some extent concealed from the observation of the readers of pictorial journals: but evidence of the change would still be visible, during the short period, in yachts that were laid up, and in falling prices of country houses. There is reason to believe that this represents what has actually happened in regard to the wealthier sections of the population of Great Britain, since the heavy increases in the Income Tax (and Death Duties) were imposed during the last twenty-five years.

Hence we see that, as a result of the increase in the income tax, and the corresponding increase in the type of public expenditure which we have mentioned — namely, a direct distribution of money to certain classes of individuals in the community — an elaborate

system of alterations will be set up in the demand schedules for the various goods in our imaginary community. And we are able to say that, in any short period following the imposition of the tax, in which the supplies of the factors of production have not considerably altered, the *amount* of goods and services consumed by the poor in the community will be increased, while the *amount* of goods and services consumed by the rich will have diminished.

4. The effect of the income tax in altering the consumption of divisible goods and the demand schedules for them in the long period.

In the long period, as we go on to prove, the supplies of the factors of production will have altered : the size, and perhaps also the distribution of the national income will, therefore, alter on that account.

If we were temporarily to make the assumption — to be discarded immediately afterwards — that the gross relative shares of labour and capital in the national income remained unchanged after the tax, then since the general level of taxation falling on the incomes of the rich was higher after the tax than it had been before it, the most likely outcome would appear to be that the *proportion* of the national income of goods and services going to the working classes in wage payments together with benefits from the social services, would be increased. Conversely, the proportion of the national income of divisible goods and services consumed by the rich would be diminished.

5. The influence of the income tax in altering the consumption of indivisible goods in the short period.

As a result of the increased tax receipts, the

Government of the community will supply a greater quantity of indivisible goods to the population. It may add to the navy, or build new law courts, or provide additional educational facilities.

6. The consumption of indivisible goods in the long period.

In the long period, we have said, factorial supplies will have altered. If we were again to assume, temporarily, that the relative shares of labour and capital in the national income remained unchanged, then, since the general level of taxation was higher after the tax than it had been formerly, it would appear likely that the supply of indivisible commodities would represent a greater *proportion* of the total of goods and services consumed by the community than in the initial situation of equilibrium. (Here we regard each of these two supplies, that of divisible and that of indivisible goods, as being measured by their cost of production.¹)

7. Alterations in the prices of (divisible) goods and services in the short and in the long periods.

We have shown that in both the short and in the long periods, the demand for the different goods and services which are consumed by individuals and by the Government, will have altered as a result of the tax.

In the short period, the goods for which demand has increased, will, since the law of diminishing marginal returns is then in operation, have risen in

¹ The assumption of unaltered relative shares of labour and capital in the national income, is introduced temporarily in §§ 4 and 6 only, in order to draw attention to some of the issues involved. No further use is made of the assumption in this book.

price; and those for which demand has fallen, will be lower in price. Owing to the redistribution of money through the expenditure by the Government of the tax proceeds, therefore, the goods consumed by the poor will, on the average, have risen in price, and those consumed by the rich have fallen in price.

After the lapse of the long period, the plant of the community will have become adapted to the new stabilised conditions of demand; some industries will be on a greater scale than initially, others on a smaller. The industries for whose commodities demand is relatively greater as compared with the initial situation, will employ a greater proportion of the factors of production than the industries for whose commodities demand has, relatively, fallen off.

If, in the long period, factorial prices were to have come to stand at the same levels as initially — a very improbable assumption, as we shall see later — then those goods which are consumed by the poorer sections of the community, and which are produced under the law of decreasing costs, will have fallen in price; those produced under the law of increasing costs will have risen in price. A majority of the goods consumed by the poorer classes (or other classes), however, are likely to be produced under the law of constant costs;¹ and, if factorial prices were unaltered, the prices of these goods would be unaltered.

The case of the goods dominantly consumed by the rich could be similarly dealt with.

Actually, we go on to show, at the end of the long period the supply of the factor labour, and the supply of the factor capital, will have altered. One of these will have become more plentiful relatively to the

¹ Sraffa, *Economic Journal*, 1926, pp. 540-41.

other than it had been initially. In this case a good, whether consumed by the rich or by the poor, will have fallen in price relatively to another good, if it uses in its production a greater proportion of the factor which has become relatively more plentiful. A simple algebraical proof of this should be given.

8. The changes which take place in factorial rewards throughout time, as a result of the changing structure of demand.

In the short period there will be an increased demand for the factors of production which are engaged in manufacturing the goods consumed by the poor and by the Government ; and rising rewards will be paid to these factors. Conversely, the rewards of the factors of production which are engaged in the manufacture of goods consumed by the rich, will fall during the short period.

The issues involved can be seen sufficiently clearly, probably, if we consider a single instance. Let us suppose that the Government has decided to increase the size of its navy, and places orders with the various shipbuilding firms. The firms already in the industry and with an established reputation, will, in this case, tend to benefit from the diversion of purchasing power to naval defence. The more quickly the Government wishes to complete its naval programme, and the more difficult it is for new firms to enter the industry concerned (*e.g.* through the need to establish a reputation for quality), the greater will be the benefits enjoyed by the firms which had been in the industry to begin with. Also, the more difficult it is to train labour for the industry for whose commodity demand has increased, the greater will be the benefits

to the labour factors which had been in the industry initially.

Thus if battleships be ordered in a hurry, the already-existing firms and the factors which they employ, will very quickly enjoy increased remunerations. To begin with these benefits will accrue, perhaps, to the shipbuilding firms and producers of steel: after that to ships' joiners, painters, electricians and suppliers of ships' furnishings. Positive quasi-rents accrue to shipyard owners and to steel companies in the first instance, and to all factors employed by them.¹ As these positive quasi-rents reach their peak and begin to fall, the quasi-rents for the second group, ships' furnishers, etc., will begin to grow. After the lapse of a further period, the quasi-rents of the ships' furnishers will also subside; and those of the people who constitute the personnel of the navy and man the battleships which have been built, will begin to rise. The waxings and wanings of these different series of quasi-rents illustrate the importance of the time element in the whole process.²

If the firms benefiting from these increases in Government demand, bid away factors of production from other employments, then the capital-owners in these other lines of production (*e.g.* the building of merchant vessels or the building of steel bridges), will tend in the short period to experience negative quasi-rents which will vary through time.

Perhaps, however, the extension in governmental functions will be of a type more closely related to the

¹ Using the term "positive quasi-rent" to denote a return greater than normal.

² Cf. Pugliese, "Un imposta sul reddito lordo delle imprese speculative e i suoi effetti", *Giornale degli Economisti*, 1933.

system of production than, say, military preparations. It may be, for example, that additional road-making or road improvement is undertaken. In such a case the factors engaged in making roads will benefit. When the road-building has been completed, the position of road-transport firms will be improved relatively to that of the railway companies. The shareholders and employees of railway companies will lose, and those of the road-transport firms will profit from the change.

The variations in the rewards of the factors of production will depend also on the behaviour of the supplies of the factors, which we now go on to examine.

CHAPTER XII

THE EFFECT OF THE INCOME TAX ON THE SUPPLY OF LABOUR PER INDIVIDUAL.

1. We will suppose in this chapter that the number of individuals in the community remains unaltered ; and that the industrial and employment opportunities with which each individual is confronted also remain unaltered after the tax is imposed.

When the increment in the income tax is imposed, the people in the community who have to pay it experience a reduction in the amount of income that they receive from each unit of their labour output. For example, a doctor who formerly had received ten shillings for a visit to a patient, may now receive, after paying twopence in income tax to the Government, only a net nine shillings and tenpence. A barrister for the last or marginal brief prepared by him, in the initial state of equilibrium perhaps had received £30. Now, after payment of income tax, he may only receive for the same brief, £29 : 15s. A worker, again, may now receive for a day's labour nine shillings and elevenpence in place of ten shillings as formerly. Will the people whose incomes are reduced by the tax in this way, work longer or shorter hours than they had done formerly ?

Professor Knight has argued that when an income tax is imposed, each individual, as a result of it, will necessarily increase his supply of labour. His argu-

ment can be summarised as follows.¹ In the condition of affairs after the tax has been imposed, he says, each individual, if he continue to work the same number of hours as before, will have a smaller net income. The marginal utility of a unit of this smaller income will, therefore, be greater than the marginal utility per unit in the initial state of affairs. Hence in the new situation the last unit of each commodity which he purchases, will have to afford him a higher utility than the last unit of that commodity had done to begin with. This can only be the case if the individual purchases less of each commodity.

One commodity which the individual purchases, however, is leisure. The individual as a result of the tax, therefore, must consume a smaller quantity of leisure than he had done to begin with. His hours of leisure are fewer; that is, he works longer hours than he had done to begin with.

Knight's argument, it is true, recognises that when an income tax is imposed a change takes place in the utility of a unit of income to the individual. But it does not take into account that when the tax is imposed, among all the commodities consumed by the individual, one, and one only, has altered in price — the price of leisure has fallen. The doctor in the arithmetical example can now purchase leisure equal in amount to the time of one visit, for nine shillings and tenpence instead of ten shillings as formerly. Similarly, the price of leisure to the barrister and the workman has fallen. Because of this

¹ F. H. Knight, *Risk, Uncertainty and Profit*, pp. 117-8. This bird's-eye view of Knight's argument follows R. Frisch, *New Methods of Measuring Marginal Utility*, p. 100. Frisch's work is the outstanding treatment of the whole problem.

fall in the price of leisure, the individual may possibly be induced to purchase not less, but more leisure, after the tax, than he had done to begin with.

2. Work for the individual is fundamentally an exchange of leisure in return for income. It is just as if he were giving away some of the commodity A which he possesses (leisure), in return for the commodity B which he wishes to acquire (income).

Now the price or exchange ratio at which the individual is able to effect this interchange between leisure and (net) income, will depend on the gross wage rate that industry pays to him, wage per hour say, and the amount of this wage rate that the Government absorbs by its income tax. We will neglect at this stage of the argument the problems arising from the fact that, in the real world, an individual finds it difficult to obtain work except for a definite length of working day, say an 8-hour day; and our supposition will be that it is open to him to work whatever length of day he may choose, on the same conditions as to wages, etc., as he would do for the 8-hour day.

In these circumstances the individual's gross rate of remuneration is a constant quantity, perhaps two shillings per hour, and is independent of the number of hours that he works. Yet his net rate of remuneration will vary with the number of hours per day that he works; because the rate at which he pays income tax, if it is a graduated tax, will depend on his size of income; which, in turn, depends on the number of hours per day that he works. When he is deciding the number of hours per day that he will work, it will be this net rate of remuneration which the individual takes into account; in the same way as it is its net

earnings and not its total receipts which matter to a firm in any line of business.

The effect of the tax on the number of hours labour per day of an individual, can be shown by means of indifference curves. Let leisure be measured along the axis Oy ; along the axis Ox let net income be measured. The diagram has reference to a day's

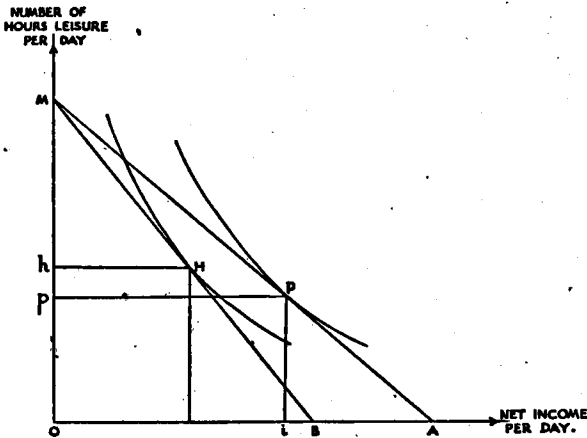


DIAGRAM I

time. In it the indifference curves of the individual, showing his scale of preferences as between leisure and income, are drawn. (See diagram I.)

There are 24 hours in the day; so that the maximum possible quantity of leisure that the individual can enjoy will be 24 hours = OM in the diagram.

In the initial state of affairs, at the existing wage rate if the individual were to devote the whole 24 hours of the day to labour (supposing this to be physically possible), he would gain a total net remuneration per day equal to OA in the diagram.

Now it can be shown that in the initial state of affairs, if there be no income tax,¹ all of the possibilities of exchange for the individual between leisure and income are represented by points on the line AM, joining the given points A and M.² Of the choices which are open to him in this way, the individual will select the one which he most desires, by coming to rest at the point on the line AM at which this line becomes a tangent to an indifference curve. It can be shown that there will be only one such point. When he comes to rest in this way, the individual will then be choosing that combination of leisure and income which brings him on to the highest indifference curve in the system which it is possible for him to reach. The individual with the system of indifference curves of diagram I, will attain equilibrium at the point P.

When he is in this position the number of hours worked per day by the individual, can be got by taking (24 hours — the quantity of leisure he consumes), that is $(OM - Op) = pM$. Initially the number of hours worked per day = pM .

The effect of the imposition of the tax is to alter the rate at which it is possible for the individual to exchange leisure for net income. The gross rate of remuneration, *ex hypothesi*, remains constant. He

¹ The case where in the initial state of affairs an income tax, either proportional or graduated, is in existence, can be similarly dealt with.

² In diagram I and also in diagram II the exchange ratio between leisure and net income is shown as the slope of a straight line. This corresponds to the case where a proportional income tax is levied, from which no income is exempt. In the case in which the marginal rate of the tax is progressive (regressive), the "line" showing the exchange ratio between leisure and net income will be a curve that is concave (convex) to the *x*-axis. But the treatment will remain substantially unchanged.

now pays income tax on such remuneration : his net rate of remuneration is reduced, as a result of the tax ; and if, in these new circumstances, he were to devote 24 hours of the day to labour, his total net income per day would be OB instead of OA as formerly. All possible positions of equilibrium open to him, now lie on the line BM . As before, the position

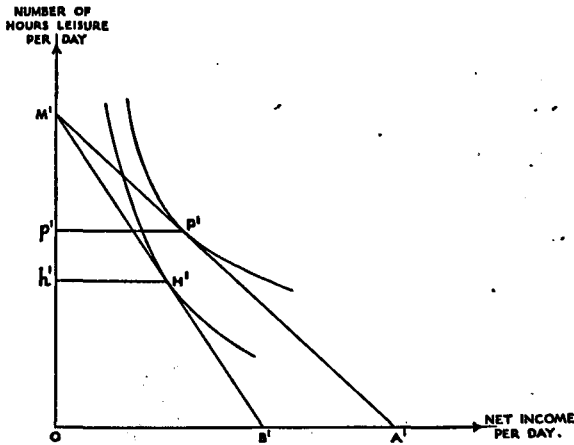


DIAGRAM II

of equilibrium that the individual will select will be that at which BM becomes a tangent to an indifference curve. This, for the system of indifference curves of diagram I, is at the point H .

After the tax, the individual of diagram I will work hM hours instead of pM as initially. That is, as a result of the tax he will curtail his supply of labour by ph units.

Let us, however, draw another system of indifference curves, as in diagram II, corresponding, say, to the tastes of another individual in the community. And let the points M^1 , A^1 and B^1 have the same

significance as M, A and B respectively, in diagram I. In diagram II the initial position of equilibrium for the individual corresponding to the line of exchange A^1M^1 , between leisure and net income, would be the point P^1 . As before, the individual's line of exchange after the tax would be B^1M^1 , and his position of equilibrium the point H^1 .

In diagram II the individual had, to begin with, worked p^1M^1 hours per day; after the tax he works h^1M^1 hours. In the final situation after the tax has been imposed, he works h^1p^1 hours per day, more than to begin with.¹

Thus the individual whose indifference curves had the constellation of diagram I, would contract his supply of labour when the tax was imposed; but the individual of diagram II would extend his.

No general rule, therefore, can be laid down. The outcome, whether towards a contraction or an expansion in the individual's supply of labour, depends on the shape of the indifference curves for the particular individual concerned.

3. From an indifference curve diagram of the type that we have been considering, a further diagram can be derived in which only the two variables appear that directly interest us, viz. number of hours of labour worked per day and wage rate. For example,

¹ The treatment we have given assumes that the system of indifference curves for each individual remains fixed and stationary; this is equivalent to the assumption that no uncertainty exists. To take into account the effects of uncertainty, we would recognise that when the tax is imposed experimentation is forced on the individual, as regards the consumption of different combinations of leisure and other goods. A consequence of this is that his scale of preferences, i.e. his system of indifference curves, will itself alter through time; and the direction in which, or the rate at which, his labour supply tends to alter, will itself vary with time.

in diagram I, if the point of equilibrium be P, whose co-ordinates are (O_i, O_p) , we know that the number of hours worked per day $= pM$. Total income per day $= O_i$. The corresponding (net) wage rate is therefore given by O_i/pM .

Let us construct a diagram along whose y -axis net wage rate is measured, with number of hours worked per day along the x -axis. This gives us a curve of supply of labour for the individual concerned. (See diagram III.)

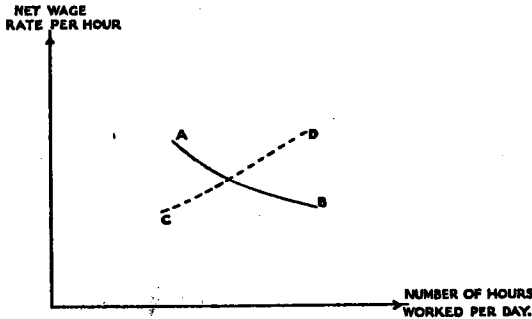


DIAGRAM III

AB is the supply curve of labour for one individual; CD that for another individual.

Our analysis relating to indifference curves has shown that when a tax produces a reduction in the net wage rate per hour, then the number of hours per day that the individual works may either rise (curve AB), or fall (dotted curve CD). Each of these cases is theoretically quite possible of occurrence. The case applying to the individual will depend on the shape of his indifference curves.

4. While it is theoretically possible that the labour-supply curve for any individual should be either down-sloping or up-sloping, in fact, for people

in the lower income strata, the curve is, on the average, down-sloping. This has been shown by Douglas for populations in the lower income strata in the United States.¹ No statistical information has yet been collected as to the response of people in the middle and upper ranges of income to changes in their rates of remuneration.

It need hardly be said that Douglas's findings in this regard, apply only to industrial workers on the average, and are not necessarily true for all workers. Individual persons, we should expect, will be affected by a given wage alteration to different extents, and some individuals may even react in an opposite way to the average.

Since, on the average, the curve of supply of labour for the lower income classes is down-sloping, people in these classes will be willing to work longer hours when an income tax, *ceteris paribus*, is placed on their wages. In practice, however, the workers in most countries pay but little towards the income tax. Exemption from the tax is usually granted until the person's income attains a certain height; deductions in payment of the tax are permitted for children in the person's family; and taxes are for the most part imposed at a less rate on "earned" income as compared with "unearned". In this way it comes about that in a country whose tax and income distribution is similar to that of Great Britain or the United States, a majority of the workers are exempted

¹ Paul Douglas, *The Theory of Wages*, chap. xii. Frisch, *op. cit.* pp. 98-9, and Pigou, *The Economics of Stationary States*, chap. xxxi, also take the view that for the average individual in the lower income classes the supply curve of labour is down-sloping; although, like Douglas, they emphasise that the statistical information available on the point is of the scantiest.

altogether from payment of income tax ; and many of those who do pay the tax on the wages that they earn, are liable at a very low rate. The extension in the supply of labour of such workers on account of income tax, therefore, will be of small amount.

From the other side of the equation, when the Government distributes the tax proceeds in its public expenditure, the benefits will go in some measure to the working classes, perhaps taking the form of different kinds of subsidised insurance, cheaper medical services, cheaper houses, and pensions of various kinds. Each person who benefits from this expenditure, whether through the receipt of increased purchasing power or through the cheapening of certain services to him, will be in possession of a larger real income than before. Money will now possess for him a lower marginal utility than it formerly had done. He will tend to increase his consumption of the different commodities which he enjoys, and one of these commodities is leisure. Most individuals in the community will, through the expenditure of the proceeds of the income tax, tend to diminish the number of hours that they work.¹

On balance the income tax, taking into account both its collection and its expenditure, will tend, *ceteris paribus*, to reduce the supply of labour in the community.

5. Let us examine the further economic effects which will follow, when a reduction in the individual's willingness to supply labour comes about in this way. Owing to a number of rigidities, such as psychological inertia and the difficulty of altering existing wage and hour agreements, it is unlikely that the hours of

¹ The effects of education and some other factors are neglected.

labour worked in industry will be reduced from, say, 8 to $7\frac{1}{2}$, until a fairly considerable period of time has elapsed. Instead, to begin with, various methods of slowing down work and making it less intense, are likely to be adopted. Piece-work may be abandoned in favour of time-work; "bonus" systems may be abandoned and more holidays introduced as an indirect means of reducing hours of labour per day on the average. These changes will secure to the workers a fuller satisfaction of their desires in relation to income and leisure.

Acting over the longer period, the reduced willingness on the part of the workers to supply labour will succeed, through a gradual remodelling of the terms of bargaining, in bringing into existence a shorter working day. The workers will then take out a larger portion of their incomes in the form of leisure and a smaller portion in the consumption of material goods.¹

In each industry there will be a number of workers, probably, who will experience, when the tax is imposed, a change in their willingness to supply labour, different from that of most other men in the industry. To such workers this new difference from their fellows will be a source of psychological strain; it will diminish the attractiveness of their own industry to them and increase the relative attractiveness of some others. This factor will tend to bring about a change in the personnel of each industry and will act as a tendency towards change in the numbers employed in each industry. Its quantitative importance, however, is not likely to be great.

¹ Cf. Pigou, *A Study in Public Finance*, 2nd edition, pp. 91-2.

CHAPTER XIII

THE EFFECT OF THE INCOME TAX IN CHANGING THE SIZE OF POPULATION IN SHORT PERIODS AND IN THE LONG PERIOD

1. THE income tax will exercise an effect on population through the redistribution of purchasing power that it brings about in the community. Some classes are rendered richer by it, other classes poorer than they were before. The classes that are richer will on that account tend to produce a larger or a smaller number of children than they had done formerly. There will be a reaction also on the numbers in the classes that are poorer.

The size of population of any given income class in the community, will depend on two factors, the birth rate and the death rate for that class. Its net fertility rate is equal to (birth rate — death rate), and gives the rate at which the population of the class increases in size. Initially, since the community which we are considering had been stationary in numbers and of a stable age composition, the birth rate for each income class must have been equal to the death rate for that class, (neglecting possibilities of immigration into and emigration out of the class)¹.

Let us examine the time-variation in population caused by the income tax, both by its collection and by the expenditure of its proceeds, on the birth and

¹ This assumes that there are births and deaths in our stationary population.

death rates of the different income classes. For convenience we speak as if the community concerned were fairly similar in its government and state of development to Great Britain or the United States at the present day.

This time-variation of population is more complicated than the usual case in economics, in which the tendency for each variable is to move progressively from its initial level towards the long-period adjustment. In the case of population, we will see, the movement is not always in a straight line towards the final position; sometimes the movement is in one direction, sometimes in another, depending on the period of time that has elapsed since the imposition of the tax.

2. Effect on the death rate in the short and in the long period.

The revenue that has been provided by the new tax increment which has been imposed, is used partly, we assume, to help to finance such things as improved schemes of sanitation, welfare clinics and other measures designed to improve the community's health. They will produce an effect in lowering the death rate that will be felt gradually and will gain slowly in strength. Over the long period the money devoted to these schemes will bring about a determinate lowering in the death rate and a determinate increase in the average length of life of people in the community. Old-age and other pensions will also exercise some effect in lowering the death rate.

There will, therefore, in the short and in the long period, be a movement, as a result of the income tax, towards a lowering in the death rate. The

movement in death rate will be continuous until the final position is reached, when the death rate will stand at a new level lower than that from which it had set out.

3. Movements in the birth rate of the lower-income classes in the short period immediately following on the imposition of the income tax.

The redistribution of purchasing power brought about by the income tax is equivalent in its effects to an increase in the wage rates of the poorer sections of the population whom the expenditure of the tax proceeds largely benefits, coupled with a reduction in the net incomes of the richer sections of the community, on whom, to a large extent, the tax is levied, and who receive little direct benefit from it.

The effect in the short period of an increased purchasing power which has come into the hands of the lower-income classes, either through, say, higher wage rates, or through increased governmental expenditure favouring these classes, would appear likely to be an increase in the number of marriages that take place in the income strata affected, and an increase in the number of births per family for the couples who already are married.

It has been verified by Douglas that a positive correlation exists between short-period movements in wage rates and short-period movements in the birth rate. He did this by fitting a straight-line curve to the statistics of wage rates in the United Kingdom, traced over the period of time 1861-1912, and in Massachusetts for the period 1889-1929. The ratio of the actual value of the wage rate for any year, to the trend value for that year, he defined as the

“trend ratio” of wages. In the same way he fitted a straight-line curve to the statistics of the birth rate over the same period and obtained the series of trend ratios for the birth rate. He then found the following correlations to exist between the movements of the statistics in the two series :

TABLE I
COEFFICIENTS OF CORRELATION BETWEEN TREND RATIOS
OF RELATIVE REAL WAGES AND OF BIRTH RATE ¹

Country	Period	No Lag	Births lagged One Year	Births lagged Two Years
England and Wales	1861-1877	+0.23	+0.28	+0.22
	1878-1912	-0.38	+0.05	+0.36
Massachusetts	1889-1929	+0.58	+0.55	..

This confirms the expectation we have mentioned, that short-period rises in wage rates would be followed by short-period increases in the birth rate. Thus we may take it that in the analogous case of an increase in the income tax, when its proceeds are partly expended so as to benefit the economic position of the poor, there will likewise be an increase in the birth rate of these classes.

In the initial state of equilibrium, the number of births per year had been equal to the number of deaths per year, for each income class. In the short period immediately following the imposition of the income tax, the death rate will have changed but little, while the birth rate of the lower-income classes will have increased. The population of these classes, therefore, will be increasing.

Even though the birth rate of the richer classes were, during the short period immediately following

¹ Douglas, *The Theory of Wages*, p. 391 and pp. 396-7.

on the imposition of the tax, to fall somewhat, these classes are not so important numerically as the lower-income classes. On balance, therefore, the population of the country as a whole in the short period immediately following on the imposition of the tax, will show an increase.

4. Effects on the birth rate of the lower-income classes, and of the higher-income classes, after the lapse of a further period of time and in the long period.

It is a well-known feature of modern vital statistics, that the birth rate for different social classes is negatively correlated with the income or social rank of these classes. The explanation of this falling-off in birth rate, as income increases, appears to be that a family, when its income is increased, comes to appreciate more keenly the advantages which attach to an improved standard of living. It comes also to be more ambitious to extend a better education and a better start in life generally, to its offspring. To achieve this the parents limit the size of their family, either by the exercise of moral restraint, or by an increased use of the methods of contraception.

The increase in the welfare of the lower-income classes as a result of the tax, has the same effect as a displacement of these classes upwards on the scale of income: and, given a longer period than we had initially envisaged, there is adequate ground, both from the side of statistics and from general reasoning, to expect a fall in the birth rate of these classes to set in.

An historical digression in elaboration of this view, may here be of some assistance. Investigations

which have been made into population, show that in England before 1877, rich people and poor people had approximately the same number of children in their families.¹ In that year the trial of Bradlaugh and Besant on a charge of publishing a piece of indecent literature, caused it to be known among the reading public, which was considerably narrower at that time than it is now, that methods of contraception existed. To begin with, this knowledge was confined for the most part to the rich and well-to-do classes; only gradually did the knowledge filter downwards to the poorer classes; with the result that even at the present day the richer the class of people concerned, the more use does it make of contraceptive methods. This is well brought out by a table of statistics quoted by Himes and based on conditions in the United States; English experience may be presumed to be fairly similar. The table shows the percentage of the very poor, the poor, etc., out of a large sample, who make use of contraception :

TABLE II ²

THE PRACTICE OF CONTRACEPTION IN RELATION TO
ECONOMIC STATUS

	Very Poor	Poor	Moderate Circum- stances	Rich
	%	%	%	%
No Contraception .	67	61	49	22
Using Contraception .	33	39	51	78
Totals .	100	100	100	100

The table shows, *e.g.*, that two-thirds of the very

¹ G. U. Yule, *The Fall in the Birth Rate*, p. 22.

² N. Himes, "New Light on the Causes of the Declining Birth Rate", in *Economics, Sociology and the Modern World, Essays in Honour of T. N. Carver*, 1935, edited by N. Himes, p. 314.

poor people in the sample were making no use of contraception and only a fifth of the rich in it were not using it. Of the intermediate groups in the sample, it was true that the higher the economic status of the group, the more the use did it make of contraception.

It has come about that in the period following 1877, the richer the class of people and the higher its social status, the smaller has been its average size of family. Stevenson gives the following table based on the figures of the Population Census of 1911. Social status descends as we move from Class I in the table to Class V. At the top, Class I comprises the rich and upper classes; and at the foot of the scale, Class V represents unskilled labour.

TABLE III¹

FERTILITY OF MARRIAGE DISTINGUISHED BY SOCIAL CLASS,
FOR ENGLAND AND WALES

Social Class	Children born per 100 Families
I	190
II	241
III	279
IV	287
V	337

The higher the social class and the higher the income, the smaller the number of children born to the average family in it.

Let us now apply this knowledge to the theory of the effects of the income tax over the long period. When, through the collection of the tax and the

¹ Stevenson, "The Fertility of Various Social Classes in England and Wales from the Middle of the Nineteenth Century to 1911", *Journal of the Royal Statistical Society*, 1920, p. 410.

expenditure of its proceeds, the poorer classes in the community benefit, the figures that we have cited strongly suggest that, once they have become adapted to the new higher standard of living, extended to them by the income tax, the poorer classes will tend to restrict the number of children in their families more than they had done in the equilibrium position from which the population had started out.

Hence we consider that although in the short period immediately following on the imposition of the tax there will be a rise in the birth rate of the population, after the lapse of a further period of time this rise in the birth rate will be more than annulled by the opposite effect of a fall in the birth rate. And it seems that the fall in the birth rate will, in all probability, carry sufficiently far to cause, even taking into account the slight downward movement in the death rate, a fall, on balance, in the size of the population.

It is of some interest to trace the probable course of the birth rate for the richer classes during the same period of time. These classes will be in receipt of lower incomes than they had been formerly. Table III again shows that a negative correlation exists between income and the birth rate. Would this lead us to expect a rise in the birth rate for those classes whose incomes, due to the income tax, have now fallen? The answer would seem to be No. The existing negative correlation has come to hold good in a community in which all classes, including the higher income classes, have been coming into possession of continuously increased incomes, and have been coming to possess a greater knowledge of the methods of birth control. But the process is not

a reversible one. If, for instance, we consider only this important factor, and we envisage the incomes of the rich as being diminished by the imposition of the income tax, the knowledge of birth control of these richer classes will not, on that account, tend to diminish and become closer to that of the class next in order below them in the social scale. Thus we cannot accept the correlation between class and birth rate given in Table III, as holding good in the case of taxation of income of these richer classes. Indeed, neither statistical nor historical investigation affords any direct parallel. Thus, as regards the effect on population in the upper classes whose money incomes have been reduced, we feel that we must shun the existing correlations and rather rely, for our estimate of the future, on reasoning of a general nature.

If we consider the notions and feelings of the rich people concerned, they have suffered a fall in standard of living of which they will be acutely aware. We should expect them to endeavour, so far as possible, to attempt to conserve their standard of living; and this would lead them to further restrict the number of their children. Our conclusion, therefore, is that when an income tax is imposed, both in the short period and in the long period after the imposition of the tax, numbers among the richer classes may be expected to fall.

5. Summary of the movements in birth rate, death rate and size of population.

The movement that will take place in the death rate of the community, as a result of the imposition of the tax and the expenditure of its proceeds, will be a slow fall. The movement that will take place

in the birth rate will be, in the initial stages a rise : after that a fall will set in. (See diagram I, following.) For a time we envisage birth rate as being below death rate in the population and the total population as declining.

In the long period, however, size of population must, on our hypotheses, attain to a certain steady

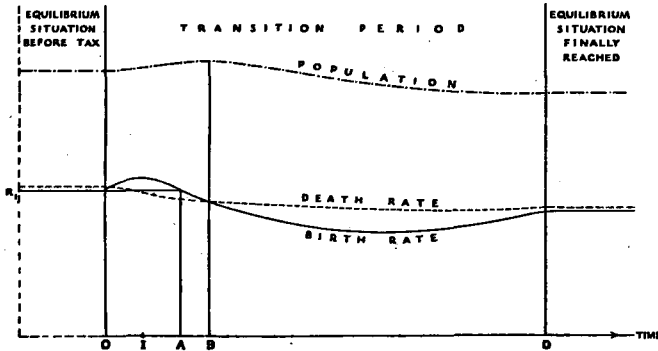


DIAGRAM I

The tax increment is imposed at time O.

Birth rate is taken to be increasing from the date of imposition of the tax until the date I, which corresponds to the highest point on the birth-rate curve. The horizontal straight line drawn through the point R, meets the curve of the birth rate at time OA. Birth rate has then fallen again to its initial height.

Population reaches its maximum at time OB, the point at which birth rate is equal to death rate.

level ;¹ birth rate must then be equal to death rate. Hence, in the intervening period, either death rate must fall to a sufficient extent as to be equal to birth rate, and this seems improbable of occurrence in practice ; or else birth rate must, after a time, rise so as to be equal to death rate. We accept this,

¹ An hypothesis that we have made is that the population starts out from a certain stable size and finally attains to another stable size. Chapter IX, § 6, *supra*.

which seems the more likely of occurrence, as being what actually does happen in our community. We give in diagram I a sketch of the movements in birth rate, death rate and total population that we expect to take place. In particular the total size of population in the final situation is smaller than that from which it had started out; and the average length of life in the new state of affairs, is longer than it had been to begin with.

The view which we take in regard to the effect produced on population in the long period, agrees with that expressed by Wright, who says that, apart from direct propaganda in favour of birth control, if it were desired to bring about a reduction in the numbers of the class of unskilled labourers, then "the most effective means towards that end appear to be a rise in the standard of life, improved social conditions and better housing accommodation, as long as these benefits are not obtained at the expense of parental responsibility".¹

When we estimate that the behaviour of the size of population will be of the fashion described, we are, of course, being purely empirical: we are stating the result that appears most likely to occur in a country about the same stage of economic and cultural development as Great Britain and which is ruled by a democratic Government. The manner in which the tax proceeds are spent, as well as the stage of cultural development of the country, will influence the size and nature of the population change. In countries subject to dictatorships, a rise in population might even take place over a considerable period of time, owing to the nature of the public expenditure financed

¹ H. Wright, *Population*, p. 165.

by the tax. Such a population increase is likely, at any rate, to be an aim of the dictators, though their instruments for carrying out this aim may prove inadequate.¹

6. In the period during which the size of the population is altering, the age composition of the population will be altering; and from the point of view of the economic results it produces, the altering age composition of the population, while it is taking place, may be hardly less important than the altering total size. In the initial stages after the tax has been imposed, babies and young people will be more plentiful in relation to people in the other age groups, than had been the case to begin with. Producers whose goods are purchased or used mainly by young people will experience, to begin with, an expansion in the market for their goods. Later they will find their markets contract. In particular, where these goods are durable and not readily put to other uses, the fall in the incomes of the producers concerned will be heavy. If in the early stages there had been correct adjustment, then in the later stages there will be "excess capacity" in the plant of such industries. Such industries will include the school teaching profession and others that cater for the needs of babies, nursing mothers and young people.²

¹ See D. V. Glass, *The Struggle for Population*, especially chaps. ii-iv. Glass mentions that the earliest Act of the German Government to stimulate birth and marriage rates, the Marriage Loan Act of 1933, was financed by an income tax. *Op. cit.* p. 22.

² L. Robbins, "Some Probable Consequences of the Advent of a Stationary Population in Great Britain", *Economica*, 1929.

CHAPTER XIV

THE EFFECT OF THE INCOME TAX ON THE QUANTITY OF CAPITAL IN THE SHORT AND IN THE LONG PERIOD

SECTION I

Analytical

1. IN order to examine the effects on capital which the small increase in the income tax will produce, we make the following assumptions :

(i) We assume that no unit of the labour force in the community is unemployed ; in the sense that if any unit of labour is willing to accept work at a certain weekly wage, and if an employer is willing to hire it at that wage, then it is open to both labourer and employer to contract accordingly.

This hypothesis, on account of certain trade-union regulations, would not be quite true of the situation as it exists in Great Britain to-day.

(ii) If we are to render the conditions of the problem definite and get a determinate solution, we must make definite assumptions of one kind or another, as to the nature of the policy pursued by the banking system in the community. The banking system might quite logically be supposed to pursue any definite policy whatever. The price movements, capital and population movements, would differ with each different policy that was assumed. Let us adopt the supposition of the classical economists,

that the banking system of the community maintains M , the volume of money, constant.

(iii) A supposition which we have already made, is that the community starts off from a condition of stationariness. For conditions to be stationary, the same amount of capital must exist in the community, year after year, the new capital goods constructed each year being just sufficient to make up for the capital which has been used up during the year. In these conditions, the total amount of the community's saving each year must be zero; because, if new savings were being made, the stock of capital would be being added to, and, by hypothesis, this is not the case. Each person in the stationary society, we will take it, is making zero savings each year; he just makes good the depreciation on his capital for the year, and consumes the whole of his net income after capital has been maintained.¹

2. The dis-saving which takes place during the short period and the movement towards long-period equilibrium.

Let us now consider the situation in the short period, of the average person on whom the increment of income tax has been imposed. He has, for a number of years before the levy, been in receipt of a certain income and has been accustomed to spending the whole of that income; his tastes and his mode of living have become adapted to this level of consumption expenditure. In the early stages after the imposition of the tax he will find it difficult to contract his expenditure below this customary level. He will tend

¹ See Joan Robinson's essays, "The Concept of Zero Saving" and "Disinvestment", in *Essays in the Theory of Employment*.

to postpone the day when he must reduce his standard of living; and at this early stage after the imposition of the tax, will prefer to meet his tax payment by a reduction in his rate of saving; that is, since his rate of saving to begin with was zero, by dis-saving.¹

Let the person's net income per year be measured horizontally and his rate of saving per year be measured vertically; and let us suppose that in the initial condition of stationariness this person's income had been OI_1 per year. Then his curve of supply of

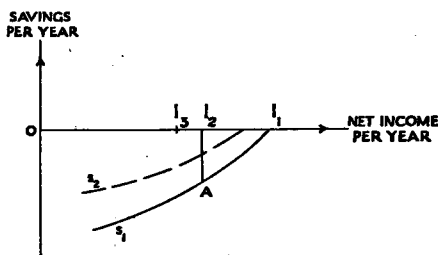


DIAGRAM I

savings s_1 , say, for the short period of length s_1 immediately following on the imposition of the tax, and before his capital and his income from capital have been reduced, will intersect the x -axis in the point I_1 (corresponding to the initial rate of zero saving); and to the left of I_1 the curve of savings s_1 will lie below the x -axis.

If the income tax has reduced the individual's income by the amount I_2I_1 , then he will be dis-saving at the rate I_2A . He will be spending his capital, and, movements in the rate of interest apart, automatically reducing the flow of future income from it.

¹ Cf. Pigou, *A Study in Public Finance*, p. 141.

Hence, after the lapse of a further period of time the individual's net income will no longer be OI_2 , but a lesser amount OI_3 say. If the curve s_1 were to remain the supply curve of savings for this individual (and similarly for other individuals in the community), the lower his income fell, the greater would be his dis-saving; and after the lapse of an interval of time, the whole of the community's capital which had been in the hands of taxed persons, would be dissipated.

But after a period of time has elapsed, when he has had the opportunity to make the necessary adjustments in the plan of his consumption and saving, the individual, we suggest, is likely to take steps to curtail this process of disinvestment, by reducing the amount of his consumption expenditure. His curve of savings s_2 , at the end of a period of time s_2 in length ($s_2 > s_1$), will, therefore, move into some such position as is shown in the diagram; and the individual's rate of dis-saving at any level of income will be reduced. We may regard him as taking into account that the further he carries the process of dis-saving, the further he will trench on his capital and income of the future, as the cost of enjoying a higher income in the present. As prudential motives come to bear more weight with him — the attitude of the prodigal and the spendthrift has been the exception and not the rule — he will, we assume, gradually reduce the amount of his dis-saving, until, after the lapse of the long period, it again becomes zero.¹

¹ Our method of analysis consists in comparing a final state of stationary equilibrium with the state of stationary equilibrium which had existed to begin with. In order that stationary conditions should, in the long run, be achieved, there must again be a zero rate of saving for every individual in the community.

Once more he will just be maintaining the volume of his capital intact.

This happens, we suppose, after periods of different length have elapsed, for most of those individuals in the community who had originally been subjected to the new tax. The others — a very few — of whom this is not true, will consume their whole capital, and leave the ranks of the capitalists for those of the wage-earners.

The dis-saving of the rich which the tax causes in the short period, will be to some extent compensated by an increased — and therefore a positive, instead of a zero — rate of saving by the poor. The expenditure of the revenues collected from the tax will have increased the incomes of these poorer people: some money will have been distributed to them directly, *e.g.* as pensions or insurance payments; and their real incomes will have been further increased by services rendered to them by the Government, either free or at prices below the competitive market prices; *e.g.* medical or educational services. On account of these increases in their incomes the poorer classes will, in the short period, tend to save more than they had done formerly. Yet the increased supply of savings coming from this source, will, we believe, be insufficient to offset completely the fall in the rate of saving of the rich; because it will have been mainly by the rich in our community — in so far as it resembles Great Britain or the United States — that its savings have been made.

3. The volume of capital existing after the lapse of the long period.

In the short period of time after the imposition of

the tax, we have established, there will be net dis-saving, and the community's volume of capital will dwindle. But after the lapse of a sufficient period of time, we have supposed above, this dis-saving of the community will be brought to an end, and each person in the community will again maintain the volume of his saving at the height zero; and the community's capital, once this condition has been achieved, will remain unchanged from one year to another.

The volume of the community's capital will be smaller, in the new condition of affairs, than it had been to begin with. The dis-saving had been a process of capital consumption.

Furthermore, another factor would be operating in the situation before long-period equilibrium was achieved, also tending to reduce the volume of capital which is eventually in existence. In the uncertainty of the changing situation to which the tax gives rise — a situation in which demand schedules and the system of supplies of goods both undergo alteration — a considerable wastage of capital will take place. The older capital instruments and durable goods of the society will, many of them, be less well adapted to the new system of production and demand than they had been to the old. On this account their value will fall. In the new conditions too, producers' forecasts will undergo a long period of variation and gradual correction before each producer achieves the optimum adjustment of his productive resources to the demand and cost conditions of the market. The demands exercised in the market by individuals for goods, will be changing. Even if producers' forecasts had always been correct and producers had been

endowed with perfectly accurate foresight, the changing numbers, changing demand schedules and changing age composition of the population would often have rendered machinery valueless after it had been in use for some time, although it was still physically in good condition. Because of this, and because these changes render forecasting more difficult, they will be a potent force, additional to the net dis-saving that takes place, towards a reduction in the supply of capital.

4. The movement in the rate of interest had population remained constant.

The total volume of capital in the community, we have established, is going to begin to decline in the short period, and the decline will continue at a gradually slackening rate, until long-period equilibrium is reached. Had the community's total size of population remained constant meantime, we should now have established that a gradual rise would take place in the rate of interest.

Here we should have to remember, in estimating the magnitude of the quantities involved, that it is, broadly speaking, the national wealth which constitutes the supply of capital, and the annual volume of replacements in the stationary state of our imaginary community will only be a small percentage of the total national wealth. Suppose that the annual volume of capital replacements in the initial state of equilibrium had amounted to 2 per cent of the national wealth. Then even though the income tax which has been imposed creates dis-saving to the extent of 5 per cent of the annual volume of capital replacements, it will not on that account cut down

the supply of capital by anything like the same percentage: but instead only by $\frac{1}{50}$ th of 5 per cent, that is by 0.1 per cent per annum.

In a period of short duration the changing demand schedules and the uncertainty which the tax creates will probably be a more potent force than this towards reduction in the volume of the country's capital.

On the other hand, the process of dis-saving which has been set in motion will act in a cumulative fashion, the effect brought about in the course, say, of a five-year period, being, since the process of capital reduction from this cause gradually comes to an end, rather less than five times the capital wastage of the first year.¹

5. Taking into account the fall in population in the long period.

The total volume of capital in the community is going to begin to decline in the short period, and the decline will continue into the long period. Yet what matters from the point of view of the main economic variables, wage rate and real income per head of population no less than the rate of interest, is not the total quantity of capital in the community, but the quantity of capital per head. The total quantity of capital in the community, it is true, will have declined. But so also, we have found, will the population of the community in the long period. Hence although total capital has declined, it is not necessarily the case that capital per head will have declined: this may have declined, remained constant or increased, depending on the percentage decline in the total capital of the community, as compared with the percentage decline

¹ Cf. Calandra, *La ripercussione dell' imposta sul reddito*, pp. 52-3.

in population. If the proportionate fall in population has been the greater, then even though the total quantity of capital is less, the quantity of capital per head will be greater in the final equilibrium than it had been initially, and the rate of interest will be lower.

Which of the pair, capital or population, will, in the long period, have declined the more? It is not possible, on the basis of the reasoning given, to return a definite answer to this question. The quantity of the community's capital has begun to decline immediately after the tax was imposed; and the decline has been continuous. The numbers in the population have increased to begin with after the tax, and then have begun to decline. The decline in numbers may have continued so far as to leave the quantity of capital per head greater than it had been in the initial position of equilibrium: or the decline in population may have been less great than this, leaving a reduced quantity of capital per head in the community and a higher rate of interest than initially. Both cases are theoretically possible of occurrence. But the outcome seems likeliest to be, as I think most people would agree, that the proportionate fall in capital will be greater than that in population, giving a smaller quantity of capital per head than initially, and a higher rate of interest.

SECTION II

Criticism of some contrary views expressed by De Viti and Einaudi

6. Einaudi, although he is not at the time discussing specifically the question of the income tax, has

arrived at certain conclusions bearing on the point under discussion.¹

A highly important question, he says, is that of the use made by the State of the financial means that the tax has placed at its disposal. The use that it makes of these financial means may be :

- (A) just as advantageous and no more,
- (B) more advantageous, or
- (C) less advantageous,

than the use that would have been made of the funds by the private individuals concerned.

Case (B), Einaudi thinks, ought to be envisaged as a possible case in economic analysis. When (B) is realised, then although in the short period the tax may cause the flow of goods and services in the community to contract, still, over the long period, owing to the building of streets, bridges, schools and railways, it will cause the national income to expand. Einaudi envisages population as remaining constant the while. Thus his conclusion is one opposed to that at which we have arrived. We do not envisage an expansion of the national income of divisible goods and services as being possible as a result of the tax.

The source of our difference of opinion from Einaudi in this regard, arises partly from his different conception of the State from that which we entertain, and partly from our following a methodology that has more explicitly reference to the conditions of stationariness. Einaudi's conception of the State is the same as that of his teacher, De Viti. De Viti, in an important passage of his work, says that a tax instead of raising cost of production may lower it.

¹ Einaudi, " Osservazione critiche . . . ", *cit.*

“ Let us take as an example an association of proprietors who at their own expense maintain a private road for the transportation of their merchandise. The transportation is a part of the cost of production.

“ Let us now suppose that these proprietors agree to pay the State, in the form of a tax, as much as or less than they used to spend for their private road, and that the State builds and maintains a better road, on which transportation is more convenient and faster.

“ It could not be said, in such a case, that the tax increased the previous cost of transportation. It must be said to have decreased it.

“ From this special example we may pass to the general case — namely, that the introduction of public services and their growth and improvement have reduced the cost of all the productive activities of the country. Hence it is necessary to discuss the problem on the most general hypothesis that the substitution of public enterprise for private enterprise results in advantages for the taxpayers. But even if the contrary hypothesis is adopted, it will always have to be admitted that it is not the tax paid by the producer that decides, but the nature of the public services produced and the degree to which each individual enterprise can in fact make use of these services.

“ To sum up : the previous cost of production may have been increased, left as it was, or diminished by an increase in taxes. In pure theory it must be said to have decreased.”¹

In a later work of his, Einaudi, after quoting from this passage, speaks thus in the same vein as it :

¹ *Op. cit.* p. 151.

“When the tax is in fact what it is in theory, it inevitably increases and does not diminish the flow of social income; it increases saving and increases capital values. In other words when the tax is truly such, the discussion of incidence and of losses is a figurative way of speaking, which confuses ideas, because it applies to the affairs of perfect States, words which men rightly used at those times when governments were enemies, oppressors, spoilers and plunderers of the population.”¹

7. As opposed to this view of De Viti and Einaudi, it appears to us that there are only three sets of circumstances worthy of mention in which the imposition of a tax could lead to an increase in the national income.

The first of these is where the Government is wiser than the people from whose pockets it extracts the money in tax, and makes better or “more productive” use of the money. An example of this would be where, in the example of De Viti, the government drew up a better plan of a road than would have been drawn up by the private individuals in the country, had they been left to themselves.

Under the conception of perfect competition, which is used for example by Knight,² in which it is assumed that each individual knows the prices of all factors and of all commodities in the market, such a contingency as this, viz. that the Government is wiser than the individuals in the community, would not be possible of occurrence. Because, to take the example given by De Viti, why should not the manufacturers in the industry concerned have come together, and

¹ Einaudi, “*Ottima Imposta*”, *cit.* p. 81, footnote.

² Knight, *Risk, Uncertainty and Profit*, pp. 76-80.

decided to maintain the road in the way eventually done by the State? *Ex hypothesi* they must have sufficient knowledge to enable them to do so. Or else, why should not some independent company have undertaken the provision of the road services, and either made lump-sum charges on the manufacturers concerned or else charged tolls to the traffic that used it? The example chosen by De Viti in fact, when we make the assumption of the existence of the type of perfect competition that involves perfect knowledge, seems sufficient to establish the opposite conclusion from his: it establishes the conclusion, namely, that the proceeds of a tax, when employed by the Government, could never, in these circumstances, be more productive of an income of divisible commodities, than if it had been employed in industry by the persons who had paid the tax.

The assumption regarding knowledge which we ourselves have made in this book, is not so far-reaching as the one we have mentioned. We do not assume that each individual has a perfect knowledge of all market prices: but only that "when stationary conditions have emerged — *i.e.* both initially and finally — the knowledge of each individual relating to prices is taken to be stationary, though not necessarily, even then, perfect".¹ Thus on our assumption it is not formally impossible that the Government should be wiser in regard to matters like road-building, etc., than are the private individuals in the community. Yet, while on our assumption the possibility is not formally ruled out that the Government should be wiser in these matters than the people directly concerned, we consider that the likelihood of this

¹ *Supra*, Chapter IX, § 7.

being true in practice is so remote that the possibility can be disregarded in our analysis also.

The second set of circumstances in which the productive type of State action envisaged by Einaudi and De Viti might come about, would be where the imposition of the tax in question caused an increase in the net investment of the community. This might come about, say, partly because the Government had used the proceeds of the tax in a way that was productive, directly or indirectly, of divisible commodities, and partly because the tax had induced people to cut down their consumption expenditure, giving as the upshot of the whole process, the equivalent of a greater amount of yearly investment than the zero amount that there would have been had there been no tax.

Now if we were considering the imposition of an extra increment of one tax to replace an increment of another tax — *e.g.* if an additional increment of the income tax were imposed in order to enable the Government to abolish a portion of the tax on inherited estates — then it seems not improbable that as a result of the adjustment the net investment of the community would be increased. But if the problem, as in this book, is that of the imposition of an increment of the income tax, in addition to the rest of the existing system of taxation, the possibility that the effect of this additional increment of income tax should cause an increase in net investment, seems sufficiently remote in most circumstances to make it convenient that it should be disregarded in theory.

One type of public expenditure, however, does appear to exist which in some circumstances may prove more productive, (as also in others it may prove

less productive), than money invested in industry. And even though, in a certain community, it were to be true that this type of investment had a higher productivity than that of other forms, yet only a Government and not private individuals might be able to undertake it. We refer to investment in education and in public health. For special reasons, although it were to be the case that investment in education, for example, in a certain community should have a productivity greater than normal—we do not argue that this need be the case, but only that it may be so—yet it may not be undertaken by private enterprise. The reasons for private enterprise not undertaking this type of investment would be that in the case of juveniles who had been educated, difficulties would arise in regard to the ascertainment of the value of the improvement or the increased productivity that had taken place in the individual, through the education; and, in addition, difficulties of legal contract would arise which would render private enterprise rather impotent in this matter.

In this, the case where the tax proceeds are spent on education or health services, and in this case only, it appears to us, would it be useful to introduce the conception (in our own analysis of the stationary state) that it is possible that the imposition of a tax might lead to an increase in the national income of the community. However, the occurrence of the particular points in the expansion of the public expenditure of a country at which the money raised by taxation is going to be devoted in sufficient proportion to education and health, and where these services are going to be sufficiently productive of

income in the form of divisible goods and services as to cause the national income to rise, will be rare in practice. This possibility, it is true, has not been included in the analysis we have given in the earlier paragraphs of this chapter, in which we state that a necessary consequence of the tax will be to reduce the total national capital and the total national income of divisible goods.

The criticism we have given of the views expressed by De Viti and Einaudi, goes to strengthen the conclusion arrived at earlier, that the national capital will be reduced as a result of the tax — save possibly in the instance in which the proceeds of the tax are devoted in part to improving the health and education services. The dynamic phenomena which would result in this case are complex and would be difficult to deal with in exact economic terms.

CHAPTER XV

CONCLUSIONS

THE INCIDENCE OF A GENERAL INCOME TAX IN A STATIONARY COMMUNITY

1. THE period immediately after the imposition of the tax (roughly from date zero to date (OA + 15) years).

To present a synthetic picture of the incidence of a general income tax, we require to combine the effects from the three sources of change on the side of supply — change in labour supply per individual, change in size of population and change in capital structure — and to take along with these the changes which are going on in the demand schedules of the Government and of the different income classes in the community. Further, it is the moving picture of change through time that is important.

Let us take first, in conjunction with each other, the movements in population and capital in the community. The movement in population after the tax has been imposed, is, to begin with, an increase, and then a decline until a new stable level of population is reached, lower than that from which the population had set out. In the meantime, after the tax is imposed a fall in the total volume of capital sets in and continues into the long period.

If we refer to diagram I on p. 177, *supra*, birth rate is higher than the old rate, as a result of the income

tax, during the period of time between zero and OA . Let us suppose that the school education of most children covers the period of their lives between their 5th and 15th years. Then between the date zero and the date ($OA + 15$) years¹ there will be a tendency to decline in average standard of living through people having to maintain a larger number of children per family than they had in the initial equilibrium state of affairs.

During this period of time, standard of living will also be falling on account of the gradually contracting total volume of capital.

On the other hand, in this short period of time between years zero and ($OA + 15$) years after the imposition of the tax, the governmental expenditure of the tax proceeds will be acting in the opposite direction towards an increase in the standard of living of the poorer people in the community; and unless only a very small portion of the tax proceeds are spent on social services, the forces towards a rise in standard of living of the poor will outweigh those towards a decline.

If it should be the case that a large proportion of the tax proceeds are spent on social services, and if these services begin to yield their benefits immediately after the imposition of the tax (as, for example, old-age pensions might do), then the position of the poorer classes will show an improvement very promptly after the tax has been imposed — because in these circumstances the forces towards a rise in

¹ This and other dates assigned are only rough, depending on a number of variables additional to those mentioned, e.g. age of marriage of young people, changes in death rate among adults and among children respectively, etc.

standard of living of the poor will be strong, and the forces towards a decline (viz. a larger number of children per family and a smaller volume of capital), will only be beginning to come into operation.

From 15 years after the imposition of the tax until (OA + 15), the labour force of the community (through the increased birth rate between the dates zero to OA), will be increasing. The total labour supply in the community in fact, will have begun to increase before this, through the gradual lowering in the death rate which had been occurring.

The increase in labour supply at this time, like the reduction in the quantity of capital which has taken place, will tend to increase the productivity per unit of capital and to raise the rate of interest. But probably the rise in the rate of interest will be less than sufficient to bring dis-saving to an end; for the uncertainty of the period gives rise to capital wastage and the income tax further reduces the incomes of the rich. Although the rate of interest will be higher at, say, the date (OA + 15) years than it had been initially, the total quantity of capital on which this higher rate of interest is earned will be smaller; and total savings will probably, as we say, be below its initial level of zero.

There will be two forces during this time tending to reduce the value of capital goods as compared with what it had been before the tax was imposed. The change in demand schedules through the altered distribution of income, and through the changing size and age-grouping of the population, will render plant less adapted on the average to the new state of affairs than it had been in the past. Again, in the short period, we have seen, the rate of interest will tend to

increase; capital values, will, therefore, be reckoned at a smaller number of years purchase of annual income. Both these causes will act so as to reduce the capital value of plant which had been in existence when the tax was imposed.

2. From date (OA + 15) onwards to the long period.

After the date (OA + 15) approximately, the standard of living of the lower-income classes will show a tendency to rise, in so far as there will be a smaller number of children per family to maintain; governmental expenditure of the tax proceeds will act in the same direction.

Again, about the date (OA + 15), the size of the labour force in the community will attain its peak and thereafter will begin to decline. The decline in the labour force will continue until it comes down to its initial quantity, and will continue below that. This fall in the labour force will tend to cause a fall in the marginal productivity of capital, entailing a reduction in the incomes of the rich. But a much more important aspect of the contraction in labour force which sets in, is that it tends to increase the quantity of capital which is being combined with the labour of each worker. This also tends to increase the standard of living of the worker by raising wage rate.

On the other hand the reduction in the quantity of capital per head of population will still act in the opposite direction towards a fall in the standard of living; and through the continuance over a number of years of dis-saving, and capital wastage resulting from uncertainty, this force will, by this time, have gained in strength.

3. In the long period.

How far will the fall in numbers carry in the long period, as compared with the fall that has taken place in capital? Will it carry far enough to raise quantity of capital per head to its initial figure, or will it not go so far? This, we said, is the crucial question to which no definite answer can be given. But, if we may be allowed to *rely on nothing more than our own general impression* of the magnitudes of the quantities involved, we should say that in the long run, quantity of capital per head will be less than to begin with and the rate of interest will be higher.

Since the quantity of capital per head is less than to begin with, the worker's wage rate will also be lower. The worker's standard of living, however, depends not only on his wage rate but also on the benefits he derives from the increase in the social services which is financed by the tax. And even if his wage rate be lower than initially, the quantum of social services which he enjoys will partly make up, or more than make up, for his fall in wage rate. But which of these cases will hold good, whether the worker's standard of living as represented by his wage rate and the social services which he enjoys, will have been raised or lowered in the long run, as a result of the income tax, we are unable to state definitely. A vital question must, therefore, so far as we are able to see, remain without any definite answer of a Yes or No type.

4. Changes in the output of effort of the individual, in the short and the long period.

Now let us take in conjunction with capital and population movements, the movement in supply of

labour per individual in the population. The analysis which we gave, taken along with the existing statistical evidence, was sufficient to establish that, in the short period, there would be, due to the expenditure of the tax proceeds, a tendency towards reduction in the number of hours worked by the average individual in the lower income strata. In the short period following on the imposition of the tax, we should expect, not actual reductions in hours of labour worked, but instead, various tendencies towards a slowing down of the pace of work, hours of labour themselves, because of various frictions, remaining unchanged.

Over the longer period, when population and capital both alter, if the smaller quantity of capital per head, taken in conjunction with the scale of social services which exists in the long period, leaves the real income per head of the working classes greater than before, then the supply of labour per head for these classes will be less than before, so introducing a tendency towards reduction in standard of living. *Vice versa*, if it should be the case that the fall in capital per head combined with the long-period scale of social services leaves the standard of living of the working classes lower than it had been initially, then members of these classes will tend to work longer hours; and this will help to counteract the fall in the standard of living.

For those in the higher-income strata, which would include works managers, higher administrative staff, company directors, etc., and professional men like lawyers, doctors and authors, no statistical material exists on which to base a judgment of fact. Since our analytical treatment had shown that the reaction on the part of any individual might be towards either a lengthening or a shortening of

working hours, in the absence of statistical evidence for these higher-income classes, no judgment as to the probable direction of change in their supply of labour can be expressed, either in regard to the short or the long period.

5. Summary.

It may be useful at this point to provide a summary of the changes which take place, even though it should anticipate one or two points in the subsequent paragraphs.

(i) Years between the date zero (date of imposition of tax) and $(OA + 15)$ years :

There will be a very slowly falling death rate.

There will be a larger number of children to be maintained per family.

A slow progressive fall will occur in the quantity of capital per head of working population ; and a very slow rise in the rate of interest.

The poorer classes will benefit from the expenditure of the tax proceeds — the more so the greater the proportion of the revenue of the income tax which is spent on social services.

On balance the standard of living of the poorer classes will rise. If the social services yield their benefits quickly (as, e.g., old-age pensions), the rise in the standard of living of the poor will be particularly great in the early stages.

The labour force will be increasing between the dates 15 and $(OA + 15)$.

Alterations will take place in the system of demand schedules for commodities and factors of production as a result of the collection of the tax and the expenditure of its revenue.

(ii) After date (OA + 15) :

The fall in the volume of capital, as a result of dis-saving and capital wastage, will have gained in strength by this time, tending to raise the rate of interest.

The labour force of the community will be declining, tending to increase the quantity of capital per head and to lower the rate of interest.

The adaptation of the productive structure of the community to the changing demand structure will be going on.

(iii) In the long run :

The percentage fall in the size of population, we expect (or guess), will be less than that in the volume of capital.

This will give a lower wage rate than existed to begin with and a higher rate of interest.

The poorer classes, however, will still enjoy the benefits additional to their wages, which they derive from the social services financed out of the proceeds of the tax. This will compensate their standard of living, either wholly or in part, for the fall in their wage rate. But whether their resulting standard of living will be lower or higher than it had been to begin with, we do not find it possible to say.

If their resulting standard of living is higher than initially, their hours of work will be shorter ; if their standard of living is lower, they will work longer hours than to begin with. (Here we are regarding hours of work as dependent solely on standard of living, irrespective of how wage rate and social services contribute to make up that standard of living.)

6. The changing structure of demand and production in the short period.

As to the part played by changing demand schedules in the community, the disbursement of a greater proportion of the national income on the goods and services consumed by the working classes and the Government will involve a rise in the short period in the prices of these goods, and positive quasi-rents for the factors engaged in making them. The factors which supply the rich with consumption goods will, at the same time, be getting negative quasi-rents. With the lapse of a further period of time, factors of production will gradually transfer from the one set of industries into the other. New factories will be built that provide for the consumption of the poor and that manufacture those goods consumed by the Government for which demand has increased. Certain firms which had catered for the rich will not renew machinery as it wears out and will go out of production; and for some time after the imposition of the tax a larger *amount* of plant in the community will be concentrated in the one set of industries than had been the case to begin with. As the transference of plant takes place, the price rises which had taken place in the goods consumed by the poor and by the Government will subside: the positive quasi-rents of the factors engaged in the manufacture of these goods will likewise subside.

Similarly in the case of goods consumed by the rich, the prices of these goods and the rates of remuneration of the factors making them will, in the short period immediately following the imposition of the tax, fall below their previous levels. But with the lapse of a further period of time the prices of these goods and the rewards of these factors, will begin to move upwards towards the heights at which they will

stand in the long period. The price movements upwards, for both goods and factors, will be the quicker,

- (a) the less durable are the goods concerned, and
- (b) the more readily are the factors engaged in making them transferable to other industries.

A corresponding system of transfers of income and capital among the individuals in the community will be set up. Some individuals will profit in a way that had not been foreseen, from the changes which take place; others will lose. The talents and capital of some men will be better adapted to take advantage of the new state of affairs than they had been to take advantage of the old; of others, less well adapted.

7. The consumption of divisible and indivisible goods in the long period.

The supplies of the factors of production will be different in the long period from what they had been initially: and we have pointed out that wage rate will be lower and the rate of interest higher. The heights of wage rate and the rate of interest, the quantities of labour and of capital, together with the tax and expenditure structure of the community will determine the long-period pattern of consumption of divisible and indivisible goods in the community. But it is doubtful, if, in the absence of a more quantitative treatment than we have given, anything more than this can usefully be said about the quantity of divisible and of indivisible goods that the community will consume in the long period.

We have pointed out earlier (Chapter XI, § 7), on what factors relative movements in the prices of

divisible goods will depend. Since wage rate has fallen and rate of interest risen in the final as compared with the initial situation of equilibrium, goods which employ more labour in their manufacture will, in the long period, have fallen in price relatively to those which employ more capital.

CHAPTER XVI

CONCLUSIONS (*continued*) THE INCIDENCE OF A GENERAL INCOME TAX IN A PROGRESSIVE COMMUNITY

SECTION I

Analytical

1. HITHERTO we have only taken into account a society which, apart from the effects of the income tax, is in a condition of stationariness: but the conclusions arrived at in relation to a society of this kind, we believe, can be transferred, with some modifications, to the case of one which is progressing in wealth and population. The community we now envisage is one which is progressing continuously and smoothly in wealth and in industrial technique and whose population is continuously increasing.¹ The problem at issue is that of determining the difference between the state of this progressive community at any given moment in time if its system of income tax had remained unchanged, and the state of the community at the same moment in time when a small additional increment of income tax is used to finance the various governmental services.

2. The imposition of the tax and the expenditure of its proceeds in the advancing community, would tend eventually to cause a fall in the birth rates of the lower classes; because it increases the real

¹ No account is taken of trade cyclical effects.

incomes of these classes and this in turn sets a complex of forces in action towards a reduction of birth rates. To begin with, however, the effect of the taxation and the consequent benefits in real income to the poorer classes, will be to raise their birth rates; though the rise in birth rate after a few years, when the ideas and knowledge of the people concerned have had time to become more adapted to their new income status, will gradually turn into a fall.

3. In the case of a stationary community, we found, the imposition of an income tax brought about a reduction in the annual rate of saving and investment; and in a progressive community the effect of the income tax will ordinarily be the same as this. An analytical proof that this is so can be given along the lines of the previous proof. Diagram I of Chapter XIV can be regarded as valid for an individual in the community at a particular instant of time, if the curve AI_1 is prolonged above the x -axis, since, in the progressive community, the individual's savings may be positive and greater than zero. The effect of the tax will be to reduce his total net income and so to reduce the sum of his consumption expenditure and savings. To begin with, those people on whom the tax is levied will tend to reduce their savings to a greater extent than their consumption; but gradually their consumption will be further restricted. The tax, therefore, will reduce the volume of saving and of investment of the progressive community in the same manner as it did in the case of the stationary community. If, as we believe will be the case, the reduction in the volume of capital at any point in time is by a greater percentage than the fall which the tax has induced in the size of population, its effect

will always be towards raising the rate of interest, and towards reducing wage rate.

4. We show in the next chapter that the probable effect of the tax will be to reduce the volume of risky and venturesome business which is undertaken, in a greater degree than that of the safer kinds of business; and this will retard the advance of industrial technique, and retard the rate of growth of real wages.

5. For the progressive community, as for the stationary community, the effect on the output of effort of the individual brought about by taxing his income, may be either to increase or to diminish his output of personal effort. This may be proved by considering the diagrams I and II which we gave in Chapter XII, and which are applicable to the case of an individual in the advancing community at a particular point in time: the same proof would then apply as before.

In so far as the Government spends the proceeds of the tax on social services, this increases the standard of living of the working classes and tends to lead them to curtail the length of their hours of work. The greater the proportion of the tax proceeds which are spent on these services, the stronger will be the tendency in the short period towards a reduction of hours of labour.

In the longer period, whether the income tax has led to a resultant shortening or lengthening of hours of labour, as compared with what they would have been in its absence, will depend on whether the total effect of the tax, taking into account population changes, changes in the quantity of capital and in the volume of risk-bearing undertaken by the com-

munity's industry, has been to raise or lower the standard of living of the workers from the two sources, wages and social services. Whether the workers' standard of living will, on balance, be raised or lowered eventually, we find ourselves unable, as in the case of the stationary community, to state definitely.

6. As in the case of the stationary community, the demand schedules for commodities will be altered. To begin with, after the imposition of the tax, the rate of consumption of divisible goods by the working classes, and the rate of consumption of indivisible goods by the community as a whole, will be increased; and the rates of remuneration of the factors which supply them will be increased. The consumption of the rich, during the same period, will be on a lower scale than it otherwise would have been, and the factors which supply goods to them will get lower rewards.

The amount and structure of consumption of divisible and indivisible goods after the lapse of a longer period of time will depend on the extent of the alterations brought about by the tax in the quantities of the factors of production and in their rates of remuneration.

Since the tax has brought about a rise in the rate of interest and a fall in wage rate, as compared with what they would have been in its absence, goods in whose costs of production capital figures more largely will tend to rise in price as a result of the tax, relatively to those whose costs are accounted for in a greater proportion by labour.

SECTION II

*The case of Great Britain*¹

7. Throughout the nineteenth century and the early part of the twentieth century, the population of Great Britain grew at a very rapid rate, and additional workers swelled the labour force of the country. For each of these additional workers industrial equipment had to be supplied.

Again, owing to the continuous growth in industrial technique and the manner of its growth, the equipment of machinery and tools used, both by those already engaged in the industrial process and those just entering it, was always becoming more elaborate and more costly. The cost of the new industrial equipment for the existing labour force and for the new entrants into industry, was met out of the savings which the community continued to make during the period.

As is well known, in the future the population of Great Britain, after reaching its peak about 1942, is going to begin to decline. The demand for capital arising from this source, however, does not depend on the rate of growth of the total population, but on that of the industrial population of the country: and the figures show that there will be no appreciable decline in the number of occupied population of Great Britain until some time after 1950.² But, and this is the important point, the continuous growth in

¹ Colm and Lehmann, *Economic Consequences of Recent American Tax Policy*, deal with the similar problems which confront the United States.

² See p. 239, *infra*.

population which the nineteenth and early twentieth century experienced, is going to disappear; and the demand for capital to provide equipment for new entrants into industry is going to dry up.

Next, the demand for capital per worker already in employment depends, in an important degree, on two technological factors: (a) the rate at which technical progress is taking place, and (b) the rate at which this technical change (operating in conjunction with economic factors) tends to increase the costliness of the machinery in use. The manner in which these two factors will behave in the future can, of course, only be guessed at: but the feeling appears to be very general that technical progress has shown a slowing-down since the Great War and will continue into the future at a rate which will become slower; and that the nature of the technical change of the future will be less pronouncedly towards increasing the cost of the equipment per worker than it has been in the past. The demand for new capital arising from the source technical progress, therefore, appears likely to be on a smaller scale than in the past.

In these circumstances, it seems probable that the demand for new capital in this country from each of these two sources, growth in the industrial population and change in industrial technique, is going to bear a considerably reduced ratio to the national income from what it did in the pre-war epoch. Now, according to the manner of reasoning of the classical school, which employs among its other assumptions that of full employment, little or no difficulty need be experienced on this account. If the demand schedule for capital falls, while the community attempts to save as high a proportion of its income as before, the rate

of interest will fall sufficiently to induce entrepreneurs to intensify the use of capital in each of its various employments, while, by hypothesis, the volume of employment remains unaffected. The new savings will, on this theory, fulfil a useful function.

It is to be doubted, however, whether this theory fits the situation very well at the present day. Keynes has shown that the rate of interest offers a strong resistance to a fall below a certain level; and that the probable effect if people attempt to maintain savings at their previous rates in face of a falling demand schedule for capital, may be that severe unemployment will ensue, which will drag down the national income of the country to such a level as will enable a quantum of savings to be made, small enough to be absorbed by industry at a rate of interest which is scarcely lowered at all. The process of bringing about the necessary equality between savings and investment, it seems likely, would only be completed through the community experiencing a high and continuous volume of unemployment.

In circumstances where the inducement to invest is low, the size of the national income and the volume of investment itself, will both, up to a certain point, increase, when the volume of consumption of the community is raised.¹ And one way to increase the volume of consumption of a community is for the Government to raise the height of the income tax or death duties, and spend the money in its various services. Thus in a community situated like post-war Britain, the income tax, until it attains a certain height, will be of benefit both to the national income

¹ O. Lange, "The Rate of Interest and the Optimum Propensity to Consume", *Economica*, 1938, p. 23 f.

and to national investment. Which height or structure of income tax would maximise the size of the British national income at any particular date, it is not possible, in the present state of our science, to calculate. But the theory is sufficient to show that the advent of increasing taxation in Great Britain during the war years, was much more fortunate than many people had been disposed to think.

8. The important question remains, whether the height of direct taxation in Great Britain has already passed or has not yet reached the point at which further increase in it will stimulate growth in the national income (irrespective of the manner of its distribution), and the volume of the country's investment. Any answer to this question must be in its nature conjectural. The view most favourable to further increase in the rate of the British Income Tax, would be that the height at which it would maximise the national income of the future has not yet been reached. Even on the opposite view, which is less favourable to a raising of the tax, it would still have to be borne in mind, following the Keynesian analysis, that increase in the Income Tax, until it reaches a certain height, is favourable to growth of the national income; and only after this height has been passed does a tendency to restriction of national income set in — somewhat in the fashion which the classical theory depicts.

The argument of Chapter XVIII, *infra*, on how we should desire to see the height of the British Income Tax altered, will proceed on the assumption that the point at which increasing the height of the Income Tax tends to increase the size of the national income has already been passed. This, therefore, is equivalent to the view that so far as present-day rates of

CH. XVI CONCLUSIONS. A PROGRESSIVE COMMUNITY 215

income taxation are concerned, the main factors in the situation work out after the fashion envisaged by the classical or neo-classical theory. But the guess which we hazard may be wrong; and if the reader makes the opposite guess, he will also disagree to some extent from us as to which income-tax policy it would be best for Great Britain to adopt. But even though the view should be taken that increasing the rate of Income Tax would increase both national income and national investment, the amendments required to Chapter XVIII would still, we think, not be very great.

CHAPTER XVII

THE EFFECT OF THE INCOME TAX ON UNCERTAINTY-BEARING

1. THERE are two kinds of risks in business, predictable and unpredictable risks. Predictable risks are those whose weight over a year or over the course of a number of years is known, if not for the individual business at any rate for a group consisting of a large number of businesses which are similar and similarly situated. In this chapter, however, it will only be with the unpredictable risks of industry that we are concerned. The probable burden of an unpredictable risk, or an uncertainty, as it is referred to, people may guess at, but they cannot know what the burden, either for the individual or the group, will eventually turn out to be. Such uncertainties are mainly borne by the purchasers of ordinary shares, whose yield is not of a guaranteed amount, but fluctuates according to the degree of success or failure attained by the company which had issued them; though the uncertainties borne by preference and debenture shareholders are by no means negligible.

Let us consider the process that goes on when a company makes a new issue of ordinary shares.¹ The success of the firm lies in the future, and in the present can only be guessed at. Each person concerned will form a different estimate of what its

¹ See J. R. Hicks, "The Theory of Uncertainty and Profit", *Economica*, 1931.

success is likely to be. It is as if each person formed an estimate of the chance that the share had of each different rate of return in the future. The set of estimates of any given individual in relation to any given share can be represented in the form of an uncertainty schedule as shown. (See diagram I.) The scheme of chances or uncertainty schedule in relation to a given share, will differ for each individual

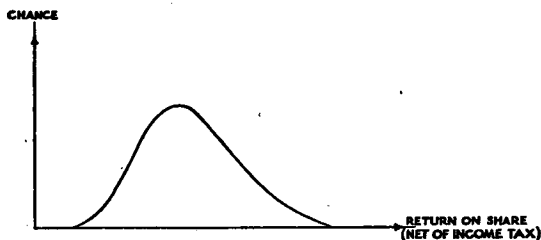


DIAGRAM I

ESTIMATE OF INDIVIDUAL A

in the community. Some, for example, may be optimistic about a certain share for which others entertain but little hope. Uncertainty schedules, that is, are subjective in nature.

Owing to the views they hold of the chances of the different degrees of success of any given share, and as well owing to their scales of preference for uncertainty schedules of different types, the people in the community will be willing to take up a certain definite quantity of that share when it appears in the market. By varying the terms of issue of the share, a demand schedule for it similar in nature to a demand curve can be obtained.

Now suppose that in the circumstances we envisage, an additional increment of income tax is imposed. The course of events at each subsequent moment of

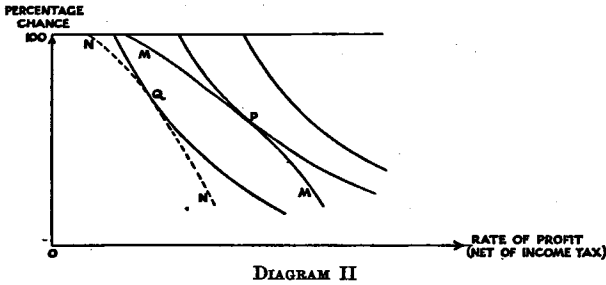
time will be different from what it otherwise would have been. But for shortness let us speak as if we pictured the same firm as before, issuing at any particular moment in time, the same share as it would have done had there been no income tax.

When the income tax is imposed it alters the whole complex of business conditions at all subsequent times. Each individual will form an estimate of the company's chances of gain, different from what he would have done had there been no additional tax. The uncertainty schedule corresponding in the mind of the person to the gross return on the given share, will, that is, be different in shape from what it would have been had there been no additional tax. Also part of each gross return that the share earns, will be absorbed by the new tax, causing a distortion in the shape of its uncertainty-curve of net return. And, further, the distribution of income and of capital, and therefore the ability of individuals in the community to purchase shares, will have altered as a result of the tax imposed; and the positions on their scales of preferences of uncertainty-curves of given shapes will have altered.

As a result of these changes, an alteration will have been brought about in the demand schedule for the shares of the "given company" at each subsequent moment of time: the company will find it either easier or more difficult to issue shares: through the tax its business will come to be on a different scale from what it otherwise would have been. The pools of capital available for the different types of businesses in the community will have altered as a result of the tax, both in absolute and in relative size. Some kinds of business will find it relatively easier to get capital,

others will find it relatively more difficult ; and the relative size and development of different kinds of businesses will therefore be altered as a result of the tax.

2. These effects can be shown more neatly using indifference curves, as follows. In diagram II, along Ox let us measure the rate of interest or profit (after payment of income tax), on capital invested, along Oy , the probability of getting the corresponding rate



of return as this is estimated by the person concerned. He may be indifferent, *e.g.* between a rate of return of 3 per cent which he believes to be certain, and a return of 7 per cent which he believes has a 50 per cent probability of accruing. The two points defined by these co-ordinates — 3 per cent return, 100 per cent probability ; and 7 per cent return, 50 per cent probability — would lie on the same indifference curve. Following this method a complete set of indifference curves could be drawn to represent the scale of preferences of the individual.¹ When we proceed in this way, it may be mentioned, we suppose the individual to take into account only the most probable rate of return on an investment, and to disregard the amount of dispersion of each uncertainty schedule.

¹ See R. H. Coase, *art. cit.* p. 20.

The individual concerned will survey the market and estimate for himself the various investment opportunities which it presents. He will take into account the stocks of 90 per cent probability, say (as estimated by him), and consider whether he should purchase that one which affords a higher rate of yield than any other at this probability. And similarly for the other shares he believes to have 80, 70, etc., per cent probability. Thus $3\frac{1}{2}$ per cent may be the highest yield which he believes it possible to get with 90 per cent probability of its occurring. If so ($3\frac{1}{2}$ per cent, 90 per cent) will be one of a series of points which lie on a curve MM in the diagram, one of which is bound to represent the final state of the investor's choice. He will eventually choose that point on the curve MM which is on a higher indifference curve than any other; i.e. the point at which MM becomes a tangent to one of his indifference curves, the point P in the diagram.

The effect of the imposition of an income tax is to reduce the rate of return on whatever stock he purchases; and the curve MM becomes displaced to the left, into the position NN say, giving a new point of equilibrium Q for the share purchases of this investor. In the case represented by the diagram the investor would purchase shares of a safer kind than he had done previously. But it would be easy to show, by drawing another diagram, that the new point of equilibrium might equally well correspond to the purchase of shares of a more risky kind than before.

Further, the income tax alters the income and capital circumstances of each individual subjected to it; and this in itself alters his preferences as between stocks of different degrees of riskiness, i.e. alters the

indifference curve diagram, perhaps in the direction of riskier, perhaps of safer, shares. And again, through the wide and pervasive economic changes which the income tax introduces into the economic system of the community, the uncertainty schedules of profit themselves, of many or all firms in the community, will be altered as a result of the tax.

3. A formal analysis of the kind we have given, however, does nothing to suggest whether, in relation to safe businesses, businesses that involve considerable risk will find capital easier or more difficult to get in a given income-tax régime; and the question, Does the British Income Tax reduce risk-taking? or, Does it reduce risk-taking unduly? remains unanswered. The total volume of investment made by the country will be cut down by the tax, we know; and we wish to discover whether the volume of investment of the safer or of the riskier kind will be reduced in the greater proportion.

Perhaps some indications of the answer to this question may be obtained if we take a more empirical view of the matter. Let us suppose that a certain individual in the absence of the tax would have invested the sum of £3000 annually, during a specified period; and with half of this sum would have bought gilt-edged stock and with the other half stock of a given, fairly risky, nature. After the income tax has been imposed he pays tax at the rate, say, of 10s. in the £, and now invests annually £2000, say. To look only at these two types of stock, Will he now make more than half or less than half of his total investment in the more risky stock?

Let us suppose that the yield on gilt-edged is 4 per cent, and the probable yield of the risky stock 7 per

cent (this being the modal yield in the probability schedule as conceived by him). Before the tax is imposed he expects, if he is fortunate, to get a 3 per cent higher yield on the risky than on the gilt-edged stock; but he knows at the same time that he runs a risk of loss, should luck be against the venture.

After the tax, the net yield to him of gilt-edged is 2 per cent, that of the risky stock is $3\frac{1}{2}$ per cent. For bearing the same industrial risks as previously he only gets a net $1\frac{1}{2}$ per cent above the return on gilt-edged. The investor, reflecting on the smaller gain likely to accrue now, even though the risks of the situation are as great as before, may decide that the risk is no longer worth taking and concentrate his purchases either more largely or altogether on gilt-edged.

It is also possible, on the other hand, that the investor, feeling rather impoverished as a result of the income tax of 10s. in the £, will, in an effort to increase his income, -use a larger proportion of his savings to purchase the risky shares.

The general belief, however, and it is a very widespread belief, is that the effect of the tax on the whole will be to make people concentrate their savings to a greater extent on investments of the safer kinds. A number of witnesses giving evidence before the Colwyn Committee agreed that the effect of the British Income Tax was to reduce the willingness of investors to assume industrial risks, a view in which the Committee concurred.¹

Stamp expresses the belief that "A moderate residuum of the whole class of the service of risk-

¹ See *Report*, pp. 142-4, 160-61, 169; also Stamp, "Taxation, Risk-taking and the Price Level", *Economic Journal*, 1928.

taking is discouraged by high taxation, perhaps to a greater extent than any common discouragement that may be postulated of energy and production in general, and that it is probably this risk element in production which would be responsible for any reduced production that occurs".¹

Meade says "a high and progressive income tax will . . . reduce the incentive to spend money on capital development".²

And Robbins: "There seems little reason to doubt that high direct taxation does tend to damp down enterprise of the pioneering risk-taking type: and the effect of this on the general rate of investment may at times have even more far-reaching repercussions".³

In the face of so much unanimity among the witnesses, although the effect of an income tax might possibly have been to increase the supply of uncertainty-bearing, we come to the conclusion that it will, in fact (in so far as it resembles the British Income Tax), reduce it.

4. The supply of uncertainty-bearing will be reduced by an income tax. What of the demand for uncertainty-bearing? One of the effects of the tax, we have seen, will be to cut down the expenditure of the rich, substituting for it, through the transfer of income carried out by the Government, an increased consumption by the poorer sections of the community. The consumption of the rich which the tax eliminates, would have been of goods of a luxury and semi-

¹ *Art. cit.* pp. 210-11.

² Meade, *An Introduction to Economic Analysis and Policy*, p. 239.

³ Robbins, "The Long-term Budget Problem", *Lloyds Bank Monthly Review*, April 1938, p. 162.

luxury nature. Now the manufacture of these goods is one demanding uncertainty-bearing: the market in them is imperfect and, very frequently, among the first to collapse at the onset of a slump when the rich curtail their luxury expenditure. There is less demand for goods of this kind after the imposition of an income tax: the demand for uncertainty-bearing coming from the industries that manufacture them will, therefore, also be reduced.¹

In place of a demand for luxury goods, the income tax substitutes a demand for the articles of consumption of the poor, food, clothing, house-room, etc. The market for these goods is much more dependable than that for luxury goods; and the industries which produce them make smaller demands on their shareholders for a willingness to bear risks.

Thus the demand made by the industry of the community for uncertainty-bearing will be reduced as a result of the income tax. We have previously seen that the supply of uncertainty-bearing provided by investors will also have fallen. Both these movements act in the same direction, towards a curtailment of the amount of uncertainty-bearing undertaken by the community. When the volume of risky enterprise is reduced in this way, the expectation must be that a slackening in the rate of industrial progress will result. Nor can we say that the industrial inventions which would have been obtained from a greater development of the luxury industries — which will be among the industries most affected — would have been useless as benefiting only the consumption of the rich; for in the process of pro-

¹ See Reddaway, "Special Obstacles to Full Employment in a Wealthy Community", *Economic Journal*, 1937.

gress the luxuries of the rich to-day, to-morrow become the necessaries of the poor, better housing, better clothes, electricity, etc. The resulting retarding of technical and inventive progress which is to be expected, is one of the costs necessarily incurred in securing the social and economic betterment of the poor in a capitalistic community through the instrumentality of the income tax.

5. Note on the depressed condition of the capital-producing industries of Great Britain after the Great War.

The depressed condition of the heavy industries of Great Britain after 1918 and before 1935 has called forth much comment. During the war the capacity and labour force of the industries was greatly increased to meet the special needs of the manufacture of guns, ships and other war materials; and with a return to peace-time conditions, unemployed plant and an unemployed labour force was to be expected. The main cause of this unemployment was undoubtedly the transition from war to peace. Yet it has passed rather unperceived that, among the many other causes, the high post-war rates of Income Tax will have played a part in accentuating the difficulties which the heavy industries were encountering.

(i) The Income Tax cuts down the annual volume of savings and investment. But investment takes the form of capital goods; and the output of the capital-producing industries, therefore, which are chiefly represented by the heavy industries, will be reduced by the tax.

(ii) The shares of the heavy industries are widely regarded as being specially loaded with risk. Through

the greater unwillingness of investors to assume risk-taking these industries must have found it more difficult to obtain capital, whether from the existing shareholders in the industries or by the flotation of new issues in the market.

And (iii) the activities and share yields of the heavy industries are notoriously dependent on the course of the trade cycle. This fluctuation in share yield can be shown ¹ to impose an additional burden of tax on the recipient of dividends and to make the shares less profitable to hold.

Each of these causes must have played some part in making investment in the heavy industries less attractive in post-war Britain; and the first two in particular must have contributed to bring about the depressed state of the heavy industries of Great Britain before the rearmament programme commenced in 1935.

¹ See Appendix, § 2.

CHAPTER XVIII

THE BRITISH INCOME TAX: HOW SHOULD WE ALTER IT?

“MANY of the children of the working-classes are imperfectly fed and clothed; they are housed in a way that promotes neither physical nor moral health; they receive a school education which, though in modern England it may not be very bad so far as it goes, yet goes only a little way; they have few opportunities of getting a broader view of life or an insight into the nature of the higher work of business, of science, or of art; they meet hard and exhaustive toil early on the way, and for the greater part keep to it all their lives. At last they go to the grave carrying with them undeveloped abilities and faculties; which, if they could have borne full fruit, would have added to the material wealth of the country — to say nothing of higher considerations — many times as much as would have covered the expense of providing adequate opportunities for their development” (Marshall, *The Economics of Industry*, 2nd edition, p. 298).

“For all men are by nature provided of notable multiplying glasses, through which, every little payment appeareth a great grievance; but are destitute of those prospective glasses, to see afar off the miseries that hang over them, and cannot without such payments be avoyded” (Hobbes, *Leviathan*, chap. 18).

SECTION I

*Judging a good tax system. Some remarks on
Method*

1. When considering the equity of taxation, writers almost without exception point out that it is useless to consider the justice of any tax or tax system without taking into account the shifting and incidence of the taxes concerned. Yet, preliminary admonitions about taking incidence into account once passed, a writer, as he proceeds with his work on equity, usually lets all considerations of the incidence of taxes recede into the background and become virtually disregarded. To be sure, this achieves a certain economy in the effort of authorship: it allows the mind at one time to become engrossed with the effects of taxes on prices and the flows of goods and services: and when this has been done, the mind, freed from these distinctively economic questions, conducts an ethical investigation into sacrifices of utility, what is just, what conduces to economic welfare and so on. But this separation of the two aspects of the tax problem, the incidence and equity aspects, with no final bringing of them together again, has done much to render the theory of public finance sterile and void of useful results.

To point the moral by referring to one of the most distinguished works in public finance, we may instance Edgeworth's "Pure Theory of Taxation", three essays published in the *Economic Journal* for 1897 and reprinted in his *Collected Papers*, vol. ii. The first two essays deal with the incidence of the various

taxes and the third with the distribution of taxation. In considering how the tax burden ought to be distributed, Edgeworth, espousing the theory of minimum sacrifice, arrives at the conclusion that a tax system ought to aim at bringing into existence complete equality of income. But, he says, any attempt to put this aim into practice would be stultified by the insuperable difficulties which would be encountered. These are the familiar difficulties of contraction in output of effort by the people who, under the scheme, would receive the same payment whether their own contribution to the national income were greater or smaller; and difficulties connected with increase of population — though the difficulties which Edgeworth envisaged in regard to population increase, do not hold good at the present day, and probably were not true either of the time when he was writing — and with infringement of the liberty of the individual.

The difficulties of putting the principle he has arrived at into practice — minimum sacrifice leading to equality of incomes — seem to Edgeworth to be insuperable. He recommends that the principle be pursued so far as it is found possible to “reconcile equality and security”, such means being adopted as “the limitation of inheritances and the taxation of unearned increments, so far as these means are free from the dangers enumerated”.¹ Though this may make Edgeworth’s theory consistent, it does not rob the criticism of its validity that the applicability of his theory to any existing set of circumstances, is obscure and difficult to perceive.² In fact there is a

¹ *Papers*, vol. ii, p. 106.

² Cf. Seligman, *Progressive Taxation in Theory and Practice*, p. 286. Edgeworth himself was quite aware of this deficiency in his method and says at the outset of the section on distribution, “The character

great need in discussions of the distribution of taxation, for a more intimate marriage of the theory of distribution with the theory of incidence.

2. A more realistic treatment of the problem of distribution and one which would take into account the incidence of existing taxes and of any others that might be suggested, would be as follows :

(a) To consider each one of a large number of ways of spreading a definite aggregate of taxation over the whole community, tracing the economic effects of each type of distribution.

(b) To consider the effects produced when this aggregate revenue is spent in each of a number of different ways.

And (c) to trace both these series of effects at each of a number of different levels of aggregate revenue and expenditure.

The instances considered under each head should be understood to be as numerous as it is conveniently possible to make them.

If we were to consider (a) 7 types of tax distribution, (b) 10 ways of spending the total sum collected, and did this for (c) each of 5 different levels of tax burden and State expenditure, this would give us in all $7 \times 10 \times 5 = 350$ different plans to be discussed. The space and time at our disposal would make any such method of procedure a counsel of perfection ; but nevertheless it helps, if we keep in mind in each problem, this, the most appropriate method of procedure, as it seems to us, even when we are not following it out.

of pure theory, deduction from received first principles, attaches not only to the incidence of taxes . . . but also—in a minor degree, doubtless—to the distribution of the fiscal burden among the taxpayers ” (*op. cit.* p. 100).

We say that the approach we mention seems, in our view of the matter, to be the most appropriate; but we do not hold that it is to be considered as necessarily, or logically, the best approach, for no one method can be shown to be necessarily the best. The determination of the optimum distribution of taxation and public expenditure, presents, fundamentally, an ethical problem; and the person, *e.g.* the Hedonist or Utilitarian, who takes a different ethical view from that of the present author, is, of course, entirely within his rights in rejecting the method of approach which we have outlined, in favour of some other better adapted to his ethical outlook.

3. The method of inquiry that we have outlined was vigorously championed by Barone, who himself made use of it. When considering a progressive community, he said, going to the heart of the matter: "Let us suppose, by way of simplification, that we were able to experiment on, shall we say, a hundred social groups, identical in every respect, but differing only in this, that a given tax burden — equal in all of the hundred groups — has been distributed in each one of them in a different way from the others. We will have the experiment of 100 different ways of distributing a given burden. Then, observing these groups after some time — after twenty years let us say — there will be found in each of them a certain increase in average income (with all its consequences on the distribution of income), different from that in the others.

"Which type of distribution, among the hundred experimented with, will we judge to be preferable? That in which the increase in average income in the twenty years had been greatest." ¹

¹ E. Barone, *Le Opere Economiche*, vol. iii, pp. 159-60.

Although we may, and do, disagree with the conclusion he reaches in the last sentence, still Barone's procedure of judging for himself which is the best or optimum type of tax distribution, by attempting to see, so far as possible, the different effects that can be produced in a given community, and then choosing that set of effects which is most satisfying to his individual tastes and conscience, seems to us to be the best method attainable: and it is the method we have advocated in the preceding paragraph, although on a broader scale than that mentioned (here) by Barone, for we consider the distribution of public expenditure and the size of the tax burden as being variable, as well as the distribution of the tax burden.

The method we describe would, we think, be acceptable to the numerous and important group of economists who desire to make economics as objective as possible, and to avoid the use of vague and not exactly defined terms such as "economic welfare", "wealth" as defined by Professor Cannan; or "utility" in the exact, but rather trivial and unreal sense in which it is usually employed in public finance. Economic welfare, for example, may depend on size of national income, distribution of national income, size of population, working conditions, educational opportunities, public health and so on. But it is not possible to say definitely that a given improvement in any one of these elements creates a greater increase in economic welfare than a given increase in another element; we do not know to what extent the different constituent elements ought to be weighted; and the concept economic welfare can never be rendered something objective about whose content everyone is

agreed.¹ If we set forth the different constituent elements in economic welfare, there is no possibility of being misunderstood; and then no judgment need be expressed as to the importance of one element as compared with another. Facts or events can be described in this objective way, without the occasion arising for expressing a value-judgment: or rather, if a value-judgment is perhaps eventually expressed (and it is as a rule useful that the author's own opinion as to what is desirable should appear at the end of his analysis), then it will be understood by all to be the personal opinion of the author which is being expressed, from which the reader who has followed, and who agrees with the analysis, will still be at liberty to dissent. It is an objective method of this kind, which separates out and leaves distinct each of the main elements, that we have advocated above: it deals with purely objective facts, and leaves any final judgment about what ought or ought not to be done, to be taken by the individual for himself.

The method has another advantage. It was mentioned earlier that the Hedonist, for example, is under no compulsion to recognise the method we have outlined as being superior to some other which he may suggest. Yet, as will be perceived, this method has the advantage that it *may* be found acceptable by the Hedonist, the Utilitarian, or the Idealist say, whereas any method of deciding what is an optimum tax system, which is explicitly dependent on the particular system of moral philosophy held by any one

¹ See Benham, "Economic Welfare", *Economica*, 1930, who has pointed out the implications of this for public finance, "Notes on the Pure Theory of Public Finance", *Economica*, 1934, pp. 444-9. The point of view of the text is also that adopted by Henry C. Simons, *Personal Income Taxation* (1938).

of these people, will in all likelihood be unacceptable to the others. The objective method is more general than any other which can be put forward, and this in itself gives it some claim to pre-eminence.

4. Having satisfied ourselves as to the status of the method described, of enabling the individual to choose which, for him, is the optimum tax system, it still remains to make the method usable in the problem to hand, and to show how we may judge, after the fashion of one who watches an experiment, what appears to us to be the best height and structure of the British Income Tax. This is the matter really at issue. Now we cannot take 100 or 1000 communities identical with Great Britain to-day, and subject each one of them to different tax and expenditure systems over a period of years. All we can do is to consider what effects would be produced in our community by each tax and expenditure structure, judging this as well as we are able from the theory of the incidence of the income tax given in this or other books, and from the theory of the incidence of other taxes given elsewhere. Again, partly through limitations of time, partly through the roughness and inexactness of our theory — our theory of the incidence of a general income tax is quantitative only in a rudimentary way — we are not able to consider profitably even a score of different types of tax and revenue structures. How many can we consider with profit? The applicability and usefulness of our method appears to be more doubtful than its theoretical validity.

Still, by a certain short-cut we can use what amounts substantially to this same method. We can fix our attention on three or four main variables in

our community (which, in this chapter, is Great Britain in 1938), and examine the reaction of any given alteration in the rate of structure of the Income Tax on each of these variables, when the corresponding increase (or reduction) in public expenditure is taken into account. The variables on which attention ought to be concentrated, it appears to us, can be picked out as being :

A. *The distribution of the national income.*—We must consider the effect that a raising or lowering of the Income Tax will have on the distribution of the national income, apart from its total size. It has been pointed out, for example, that 60 per cent of the wage-earners in Great Britain earn less than £2 : 10s. per week.¹ The difficulties of raising a family in any sort of decent fashion on so low a weekly income as this must be very considerable, and must leave both parents and children little opportunity of living what may be referred to, in a general way, as “the good life”. The desirability or necessity of improving, by means of the Income Tax or otherwise, the income and status of workers at the lower end of the income scale, we take to be beyond dispute.

B. *The size of the country's population.*—A problem which the future will have to face, and which, although it may for some years close its eyes to it, the present generation would itself be in the best position to tackle, is that of preventing an undue fall in the population of Great Britain ; and the problem is one common to all countries of advanced civilisation. If the present low rates of net reproduction² are allowed

¹ Pigou, *Socialism Versus Capitalism*, pp. 18-19.

² See Harrod, “Population and the Future”, *The Political Quarterly*, 1938.

to exist for a generation — and much more so if they fall still further, or last for more than a generation — the consequences for Western countries and civilisation will be dire. The position has been described and its consequences argued by others, in terms which seem to be irresistible and which we need not stop to debate here.

C. *The size of the national income.*—As well as it being desirable to increase the share of a given size of national income received by the workers, it is obviously desirable to increase the size of the national income itself.

We will discuss the effect of raising or lowering the British Income Tax, and of altering the tax structure, on each of these three variables, A, B and C. This should enable the reader to select that tax structure which appeals to his tastes as the best attainable; and the one which we ourselves prefer will be described.

The problem with which we are dealing here, is certainly one that must be tackled continuously over the long period. It is to the long period, therefore, we look; and so as to be definite we will try to take into account a period of about thirty years' time.

Before discussing the alterations which might with advantage be made in the British Income Tax, it seems appropriate to describe the tax as it exists at the present day. But first we will indicate a factor on which the size of the country's national income will itself depend, apart from any attempts to distribute it more equitably.

SECTION II

Probable movements in population and national income, 1938-70; and the structure of the British Income Tax in 1937-38.

5. One of the chief influences on the budgetary situation during the next thirty years of time will be the size of the national income during this period, its rate of growth, or perhaps of decline. The rate of growth of the national income will itself depend to a very large extent on the rate of technical advance in industry, on the continuance of capital accumulation, and on the size of the country's population.

As to the technical advance, we may surmise in a general way that improvement will be introduced at a rate resembling that of the last two decades, or somewhat more slowly.¹ Capital accumulation will also continue to go on: and both these causes will play their part in increasing productivity per head of the industrial population and in increasing the size of the national income.

The population of Great Britain, as is well known, is expected to reach its peak about the year 1942, when it will remain almost stationary for a short time, and then begin to decline. Here an important factor in the situation has sometimes been overlooked² — it is that the size of the national income depends not on the total size of the population, but

¹ See "The Long-time Budget Problem", a memorandum by a group consisting of Mr. O. T. Falk, Mr. T. Balogh, Mr. Geoffrey Crowther, Mr. N. F. Hall and Mr. H. D. Henderson, *The Economist*, June 11, 1938, p. 592.

² As in the memorandum *cit.* by Falk and others, which takes into account total population (of England and Wales).

on the size of the occupied population, of which total size of population may be a very poor indication. Occupied population would appear likely to vary much more closely in accordance with the size of the population group in the community of working age, those aged 15-64 years, say, than in accordance with the total size of population. Now, although Britain's total population will begin to decline shortly after 1940, owing to the large number of young people in the population at the present day, the size of the group aged 15 to 64 will not decline until some years later; and when decline in the population of working age does begin, it will be at a slower rate than that of the total population.

The following figures for the population of working age of England and Wales, are taken from the estimates of population made by Dr. Enid Charles.¹ Dr. Charles points out that the size of the country's population twenty or forty years after this, say, depends on a number of unknown factors, and this precludes the making of any quite definite forecasts: but, as she says, we can state fairly definitely certain limits within which the future size of population must lie. She made a "first estimate" of what she calculated to be the upper limit of the possible total size of population, and a "second estimate" of the lower limit of its possible size. The actual total size of population at any time will be somewhere between these two estimates. The figures we give are of the population of working age, 15-64 years, in her first and second estimates:

¹ "The Effect of Present Trends in Fertility and Mortality upon the Future Population of England and Wales and upon its Age Composition", Royal Economic Society, Memorandum No. 55.

TABLE I
 SIZE OF POPULATION OF ENGLAND AND WALES, AGED
 15-64 YEARS, 1935-70

Year	First Estimate, millions	Second Estimate, millions
1935	27.9	27.9
1940	28.7	28.8
1945	28.8	29.1
1950	28.6	29.1
1955	28.2	28.5
1960	27.6	27.7
1965	26.9	26.5
1970	25.8	24.6

Dr. Charles's first estimate was made on the assumption of unchanged fertility and mortality rates at the levels of 1933; her second estimate on the assumption that these rates would continue to fall at the rate at which they had done in a certain period before 1933. It is quite interesting, that, although the total size of population in any year on the first estimate is always greater than the total size given by the second estimate, the size of population of working age on the first estimate is less in the period before 1965, than that of the second estimate.

The figures show that the fall in the size of population of working age during the period 1940-70, will be between 10.1 and 14.6 per cent.

Not the entire population aged 15 to 64 years actually does engage in industrial occupations; quite a large proportion of the women in the population, for example, do not. The tendency to a fall in the size of the national income through decline in the numbers in the population of working age, can be counteracted partially or wholly, if a larger proportion of this population actually does follow in-

dustrial pursuits. The greater equality of income among the population, which the Income Tax brings about, will itself help to stimulate this change; more sons and daughters of rich families will be induced to find remunerative employment. But the greatest assistance to be hoped for in this regard, could be brought about through the greater emancipation of women, if they followed industrial occupations on a larger scale than hitherto, and if the professions and industries were rendered more readily open to them. The stress of circumstances, when the time arrives, the need which is felt for labour when our population of working age begins to decline, will help to bring about woman's economic emancipation.

Examining the figures we have given above, and taking this last possibility into account, we conclude that the number of people in Great Britain who actually follow an industrial occupation will not greatly decline during the thirty-year period to which we look. The national income, therefore, will suffer no great contraction through the population factor; and the expansion in it from the other factors will continue to go on. The total national income during the period, we suggest, may be expected to continue to increase, though, towards the end of the period, at a rapidly diminishing rate. Or perhaps after 1960, when the fall in the size of the population of working age becomes more rapid, the size of the national income will begin to decline. The national income of 1970, however, would appear to be certain to be higher than that of 1940, taking a rate of increase in productivity per head through technical progress and capital accumulation of only $\frac{1}{2}$ per cent per annum,¹

¹ Falk and others regard this as a low estimate. *Ibid.* p. 592.

and a decline in the size of population which is actually engaged in industry (setting aside the possibilities of the further economic emancipation of women), of 14·6 per cent.

6. In describing the British Income Tax as it exists to-day (1937-38), it is easiest to start off from the case of an unmarried person whose income is entirely "unearned", *i.e.* is derived entirely from investments. The other cases which arise can be reduced without difficulty to terms of this simplest case.

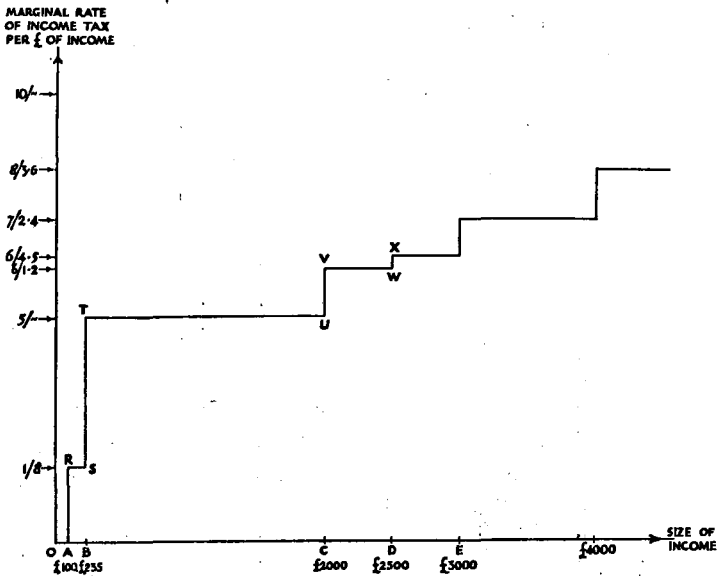
The person whom we consider, pays no Income Tax on the first £100 which he receives. On the next £135 of his income, *i.e.* until his income amounts to £235, he pays tax at one-third of standard rate, *viz.* at 1s. 8d. in the £. On each pound of income he receives above an income of £235, he pays tax at standard rate of 5s. in the £, until his total income attains the height £2000. When his income exceeds £2000, he pays on each additional pound which he receives, standard rate of Income Tax *plus* Sur-Tax. The rates of Sur-Tax at present are the following rates plus 10 per cent :

	Rate per £ of Income	
	<i>s.</i>	<i>d.</i>
On income between £2000 and £2500	1	0
On the next £500 to £3000	1	3
" " £1000 to £4000	2	0
" " £1000 " £5000	3	0
" " £1000 " £6000	3	6
" " £2000 " £8000	4	0
" " £2000 " £10,000	5	0
" " £5000 " £15,000	5	6
" " £5000 " £20,000	6	0
" " £10,000 to £30,000	6	6
" " £20,000 " £50,000	7	0
On the balance over £50,000	7	6

Thus taking Income Tax and Sur-Tax together, we find that the total rate of tax for this unmarried person whose income is "unearned" is as follows :

			Marginal Rate of Tax
First £100	.	.	Nil
Next £135	.	.	1s. 8d. per £
" £1765	.	.	5s.
" £500	.	.	6s. 1-2d. "
" £500	.	.	6s. 4-5d. "
" £1000	.	.	7s. 2-4d. " etc.

And the marginal rate of tax payable by this unmarried person whose income is entirely investment income, is shown by the curve ARSTU . . . in diagram I, in which income is measured horizontally, and the marginal rate of tax vertically.



The person whom we are considering pays no Income Tax on the first £100 of income he receives; and he is said to get a *personal allowance* of £100, frequently described as "the lower personal allowance".

If our taxpayer should be married, in addition to his personal allowance of £100 he gets a *wife's allowance* of £80: lumping together his personal allowance and his wife's allowance, he is frequently spoken of as receiving "the higher personal allowance" of £180. The diagram above is still applicable in this case, showing the rate of his tax liability, if we take the point 0 to represent not a zero income, but an income of £80.

In the same way, for each child that he has, the person gets a *child's allowance* of £60. This child allowance means that if the £60 of his income concerned lies entirely within the range at which the marginal rate of tax is 1s. 8d. in the £, he avoids a tax payment = $60 \times 1s. 8d. = £5$. If the £60 of income concerned lies entirely within the range in which the marginal rate of tax is standard rate, 5s. in the £, he avoids paying $60 \times 5s.$, that is, he avoids handing over £15 to the Government.

Next, let us consider a person who has an earned income and who makes his living by the exertion of personal effort. The first deduction to which he is entitled — and this deduction in reckoning tax is to be made before deduction of "personal allowance" — is *earned income relief* of one-fifth of his earned income. That is, he deducts one-fifth of his income, and treats the figure of 80 per cent of his income so obtained as if it were unearned income, subtracting from it the various personal allowances to which he is entitled, and reckoning his tax payment on the

basis of the rates we have mentioned above.¹

The reckoning of tax assessment on 80 per cent of the income and not on the entire income itself, in the case of "earned" incomes, is known as the *differentiation* of the Income Tax in favour of "earned" as compared with "unearned" incomes. It is one of the means adopted of graduating the British Income Tax and was introduced by Mr. Asquith in his budget of 1907.

To illustrate the above rules for computing income tax liability, we have worked out three examples in the Appendix.

7. The above-mentioned allowances represent the position in regard to the individual. A joint-stock company is assessed to tax at the standard rate of 5s. in the £ on the whole of its profits: and at this stage it is immaterial to the Inland Revenue Department for the purposes of assessment, whether the profits are distributed as dividends to shareholders or allocated to reserve. When the company is distributing dividends it deducts Income Tax at standard rate from the payments it makes to shareholders, a dividend of 5 per cent, say, representing a net payment of $\frac{3}{4} \times 5$ per cent, i.e. $3\frac{3}{4}$ per cent. The company may refer to its dividend as one of $3\frac{3}{4}$ per cent "free of tax", or else as one of 5 per cent.

If deduction of tax at standard rate in this way, imposes a larger tax payment on the recipient of dividends than that to which he would have been liable had he received the dividends without deduction of tax, then he can claim, and will receive from

¹ Earned income relief is subject to an allowable maximum of £500. This is the amount of relief on an earned income of £1500, any earned income above this figure being taxable in exactly the same way as unearned income.

the Inland Revenue Department, repayment of the amount of tax by which he has been over-assessed. Again, the shareholder's liability to Sur-Tax is reckoned so that its amount is independent of whether deduction of tax from dividends had been made at source or not.

The main advantage of this method of collection is that income only comes into the hands of the recipients after tax on it has been paid by the company, which has no incentive to avoid payment—evasion is greatly reduced. Seligman says that “stoppage at source . . . is perhaps the chief cause of the great success of the English Income Tax”.¹

The end result of the method is that a *joint-stock company pays Income Tax at the standard rate on the moneys it places to reserve*: and the individual recipient of dividends makes a payment of Income Tax which depends only on the total income he receives, and which is neither increased nor diminished by the administrative device of deduction of tax at source.

Now if we take the simplest case—the others follow a similar principle—of a company in which the only class of shareholders are ordinary shareholders, clearly in this case the ownership of the moneys which the company allocates to reserve is to be attributed to the individual shareholders in the company, the amount to be imputed to each being in proportion to his holding of shares. In so far as money allocated to reserve pays Income Tax at standard rate whether the individual shareholders of the company be rich or poor—since ownership of the moneys is really to be attributed to the individuals—the

¹ Seligman, *The Income Tax*, 1st edition, p. 216. See also Spaulding, *The Income Tax in Great Britain and the United States*, p. 229 f.

British Income Tax in this respect is not a personal income tax. That this is so must be regretted in a tax whose aim and intention is to allocate the tax burden in proportion to the ability of the individual to bear it, as judged by his total income and such circumstances as whether his income is earned or unearned, and the number of his family dependents; but we will content ourselves with an expression of regret without suggesting any means for remedying this defect in the tax.

SECTION III

How to alter the Income Tax

8. A—the Income Tax as a means towards assuring the working classes a greater proportion of the national income.

A single person whose income is entirely earned, pays no Income Tax until his income exceeds £125 a year. If the person concerned be a married man whose income is earned and who has no children, he does not become liable to the tax until his income exceeds £240 a year; or, if he have a family of two, until it exceeds £375. Thus the Income Tax itself cannot be said to press heavily on those in the lower ranges of income. We can definitely say, therefore, that there is no call for a reduction in the rates of Income Tax, or for an increase in personal allowances, or children's allowances, so far as end A of policy, the improvement of the position of the working classes, is concerned.

If we take a broader view of the problem and attempt to see the Income Tax in perspective, we will wish to view it, not as an individual item, but in

relation to the rest of the British tax system. Now, although they may pay little or nothing directly in Income Tax, the poorer classes in Great Britain do bear a considerable burden of taxes, but of indirect taxes. The *Colwyn Report* showed that in the fiscal year 1925-26 a family consisting of two adults and three children, with an earned income of £100 a year, paid 12 per cent of its total income to the Government in food taxes, tobacco and beer taxes and entertainment duty. Similarly, a family with an income of £150 paid 12 per cent of its total income to the Government in indirect taxation. On the other hand, a family with an income of £500 a year paid only half that proportion in taxes of all kinds, 6 per cent. The figures given in the *Colwyn Report* are reproduced below, and the earlier figures in the series are illustrated by the graph (diagram II).

TABLE II¹

THE PERCENTAGE OF TAXATION PAID BY VARIOUS SIZES OF INCOME, 1925-26

(The taxpayer is assumed to be married and have three children. Income wholly earned)

Yearly Income	Total Burden of Taxation as a Percentage of Income
£	
100	11.9
150	11.6
200	10.2
500	6.2
1,000	11.0
2,000	15.2
5,000	23.2
10,000	31.2
20,000	37.5
50,000	44.4

¹ *Report*, pp. 94-5.

The figures we have quoted refer to the fiscal year 1925-26. Since that date the burden of indirect taxes weighing on the poor has increased : a general system of tariff duties was established in 1932 and, in addition, Government manipulation and quota schemes have raised the prices of bacon, beef and milk. The

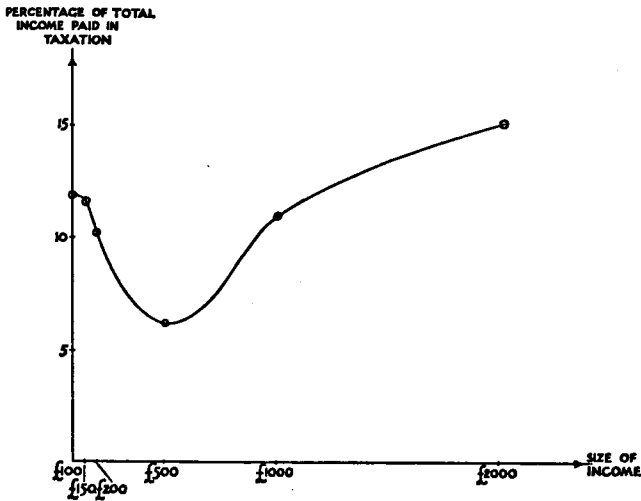


DIAGRAM II

burden of taxation on a family with an income of £100 or £150 a year is now more than 12 per cent.

Whether the tariff duties of 1932 should be removed, however, the average person would not be prepared to say from considerations of standard of living alone—the standard of employment, the bargaining power of Great Britain among the nations and other questions affecting policy would require to be debated first. Similarly the bacon, beef and milk schemes would require to be considered mainly from the point of view of strategy and an agricultural

policy for the country ; and the present is not the place where this can appropriately be done. It must, therefore, be the duties in force when the Colwyn Committee was writing its *Report*, to which we look. Let us see whether any case exists for their retention or reduction.

The figures given in Table II certainly suggest that a first step needed to improve the circumstances of the

TABLE III¹
PERCENTAGE BURDEN OF THE VARIOUS GROUPS OF TAXES
ON THREE SIZES OF INCOME (INCOME ALL EARNED)

	Yearly Income		
	£100	£150	£200
Percentage burden of Income Tax and Super-Tax
Percentage burden of Death Duties
" " Food taxes	2·7	2·1	1·6
" " Entertainment taxes	0·2	0·1	0·1
" " Tobacco taxes	2·7	2·7	2·4
" " Alcohol taxes	6·2	6·7	6·1
Total percentage tax burden	11·9	11·6	10·2

poorer sections of the community, may be to reduce the burden of indirect taxation to which they are liable. Table III analyses how the burden of this indirect taxation is made up. Of the average income of £150 per annum, for example, food taxes absorb only 2·1 per cent, and the tax on entertainments only 0·1 per cent. The burden of indirect taxation on the incomes of the poor, therefore, arises only to a comparatively small extent from taxes on food or entertainments. The main burden of indirect taxation arises from the taxes on alcoholic drinks and on

¹ *Report*, pp. 94-5. The corresponding figures for 1934-35 are given by Ursula K. Kicks, *The Finance of British Government, 1920-1936*, p. 277.

tobacco : and it would be difficult to make out a case that would be accepted by a majority of people as showing that taxation of beer, whiskey and tobacco should be reduced. Other means must be sought for improving the conditions of the poor.

The main instrument of improvement is, with little doubt, the group of social services which had grown up slowly before the end of last century and which have expanded quickly since then. We will only pause to point out the advantages of these services : on the one hand they do much to remove some of the main fears from the shoulders of the working classes, the fears of unemployment, of sickness and old age : and on the other, they improve the health and education of the people of the country, enabling them to live fuller and more useful lives. Nor is there any indication that the social services of Great Britain have yet arrived at a stage when further expansion in them would cease to be advantageous, if this could be financed in any way that was free from marked difficulties. Such a means, we believe, can be found : extensions of these services could be financed out of revenue which the Government could obtain by higher rates of income taxation. By extending and developing the social services, and at the same time imposing higher rates of Income Tax, the end could be achieved of securing a greater proportion of a national income of any given size to the poorer classes of the community. Not only so, but the manner in which the standard of living of the poor was improved, by means of carefully selected social services, would be such as most people agree to be good and improving for those who benefit.

It is true that to raise the rate of the Income Tax

in order to do this, would tend to reduce the size of the national income by cutting down capital formation and risk-taking. The changes in Income Tax ought, therefore, to be framed in such a way as to minimise losses to the national income from these sources; and we go on shortly to show the manner in which this might be done.

9. B — the use of the Income Tax to lessen the fall which is going to take place in the size of the country's population.

The present system of children's allowances in the Income Tax has been shown to be equivalent to giving a subsidy of £5 to a person whose income is such as to bring the relevant portion of his income wholly within the range at which tax liability amounts to 1s. 8d. in the £, the range AB in diagram I (above); and a subsidy of £15 if the relevant portion of his income falls entirely in the range BC, in which liability is at 5s. in the £. A person whose income is too low for him to require to pay Income Tax gets no direct assistance by way of tax remission; but he may be considered to benefit indirectly from free education, and free health and other services for his children, which are partly financed out of revenue collected by the Income Tax.

At the present day the need of this country for children, mainly because of political reasons, is great. It can be said that a person who raises a healthy child is doing a good turn to the State. At the same time the fashion of the childless marriage, or the marriage with a single child, is becoming increasingly popular. In view of this, I would suggest the following as being a satisfactory guiding principle as regards children's

allowances in the Income Tax : *if a couple have three or four children, then their economic position ought to be scarcely inferior on that account, to that of another couple who have the same income but no children.*

Indeed, some case could be made out for the economic position of the couple with children—*i.e.* the income left to them after all expenses attendant on feeding, clothing and educating their children have been met — being as good as or better than that of a couple with the same gross income who have no children. But taking into account the danger that people might come to have children in order to make a money profit, it seems preferable to state the principle in the qualified form above, in the hope that this would suffice to meet the practical needs of the situation.

Now the cost of raising a child to a person in the range in which income is taxable at 1s. 8d. in the £, is much greater than £5 per year ; and in the range where income is taxable at 5s. in the £, much greater than £15 per year. The money burden of children to their parents, causing a lowering of their standard of living, must in any age, and particularly in a hedonistic age like the present, be a deterrent to people from having children. Hence, in accordance with our principle B, child allowances in the Income Tax ought to be made larger, perhaps three or four times their present height (though the reader may judge that, for his part, the consequent loss that this would entail under the principles A and C, would make such a change seem inadvisable).

As the practical completion of this principle, at the lower end of the income scale at which people pay no Income Tax, a system of family allowances

ought to be adopted whereby they are paid for raising children. Free education, free boots, milk, clothes and medical attendance for school children, could be made part of such a scheme.

The recommendations we make in regard to principle B, like those in regard to principle A, will require, if decided upon, an increase in the rates of Income Tax and Sur-Tax, together with, perhaps, a small increase in Death Duties. Before a Chancellor of the Exchequer could induce Parliament to accept anything like the necessary rises in taxation, he would have to persuade it that no unduly serious consequences would result. "But", the objection would be made to such a proposal, "if you raise Income Tax and Death Duties, then you reduce savings and cut down capital structure: you curtail the volume of risk-taking; you retard technical progress. The nation will fall behind in the race as compared with other nations. The standard of living of the poor, after a lapse of a number of years, instead of being higher as a result of your schemes, will be lower; and eventually, in the general worsening of the situation, population also would be reduced." These possibilities and objections must now be considered.

10. C—how to use income-tax policy as a means towards maintaining as far as possible the rate of growth in the size of the national income.

It is true that the advantages to be gained under the two earlier principles have been at the expense of disadvantages to be borne, should they be decided upon, under our third principle. The higher rates of Income Tax and Sur-Tax required to finance the changes suggested would lead to a reduction in the

volume of savings of the country, and a reduction in the risk-taking by entrepreneurs, both of which would have an adverse effect on the size of the country's national income.¹

But not all that can be said in favour of the changes suggested under the principles A and B has yet been said. To realise the benefits described, the aggregate yield of the income taxes must be raised; and this higher yield must, because of the proposed increased children's allowances, be obtained from a smaller amount of assessed income. A channel of relief, however, remains open, permitting us to reduce the loss, in a falling national income, which would result from a straightforward raising of the rates of Income Tax and Sur-Tax — we may manipulate the structure of the income taxes in such a way as to make the curtailment in the growth of the national income as small as possible. Instead of a simple rise in the rates of Income Tax and Sur-Tax, we may finance the alterations we have suggested, by taxing income saved at one rate and income spent at another and a much higher rate. For instance, to mention a purely hypothetical figure, income saved might be taxed at 4s. in the £, income spent at 7s. or 8s. in the £.

This would help to induce people in all ranges of taxable income to save rather than to spend; since, under the scheme, the State would absorb a large proportion of any money that they spent on goods designed for their own consumption, whereas if they built a new factory or installed new plant, *i.e.* saved their money and invested it, the Government would

¹ Compensating factors from the side of improved health and education of workers might be brought in; but we leave them out of account so as to state the case against the changes we propose at its strongest.

be much more lenient in its demands. The standard of living of the rich, as represented by the consumption goods which they bought, would, on this scheme, be curtailed much more severely than it is by our present system of taxation. At the same time, as little bar as possible would be placed to the services they rendered to industry; for when they used their income to establish industrial projects, from which not they alone but the whole community would benefit, they would be taxed at a comparatively low rate.

By taxing income saved at a low rate in comparison to income consumed, we should hope and expect to maintain the total volume of investment at a satisfactory level, even though the change, raising a larger revenue from a smaller assessed total income, were equivalent to a stiffening in the rates of Income Tax. And if the total level of investment were sufficiently high, we should expect that the volume of risk-bearing undertaken by the community would also remain on a high enough level. The total volume of investment appears to be the index to which we should give most attention.

We would desire to see a gradual introduction of the changes which we propose, spread over a period of ten or fifteen years say, and avoiding any suggestion of abrupt change. Also the reasons behind each step which was taken should be carefully explained to the public, and the gain in equity of the tax confidently asserted. The economic basis of the scheme appears to be sound; and the main further essential for its success would be to secure the conviction in the community generally of the justice of the remodelled Income Tax and its power as an instrument of political and social betterment.

11. Fisher, Einaudi and Pigou advocate that income saved should be *wholly exempt* from income tax, which should be levied only on income consumed. The proposal we make, that income saved should be taxed, but at a lower rate than income spent, is for a system intermediate between the present system and the one which these authorities hold to be preferable. That it is nearer to the present system than theirs, and would involve a less great and less sudden jump than would their proposal, must be accounted an advantage in it; for the evolution of the British fiscal system has been one of piecemeal change. Again, the solution we suggest is more general in its nature than that of taxing savings at a zero rate, which would represent one possible case falling under our scheme — and a case which might eventually be chosen, but if so, only after it had been approached gradually *via* successive changes, each reduction in the rate of tax on income saved and the accompanying rise in the rate of tax on income consumed, being carefully examined as to its effects on investment and consumption and, through them, on the industrial situation generally, before deciding whether or not to proceed to a further alteration of these rates. There should be perpetual and untrammelled experiment to discover the optimum tax system. The writers we have mentioned, on the other hand, commit themselves to a zero rate of taxation on income saved. Perhaps they are led to do so by over-emphasis on the view that under a general tax on income, like that of Great Britain or the United States, saving is subjected to double taxation; but this, as we go on to suggest, is a rather misleading interpretation of what does take place. (See Chapter XIX *infra*.)

No doubt certain administrative difficulties would be encountered¹ in putting the scheme we propose into practice ; but after the achievements in organisation of the totalitarian countries, particularly of Germany, it would be a severe comment on our democratic countries to hold that an administrative change of this kind could not be introduced.

12. To summarise, we have proposed the following changes :

(i) That the social services should be extended and the revenue to do this obtained by raising the rates of Income Tax and Sur-Tax.

(ii) That child allowances in the British Income Tax should be increased to several times their present height, and this concession supplemented by a system of family allowances for the benefit of people in the lower-income ranges.

(iii) That the system of income taxation in Great Britain should be remodelled, so as to tax consumed income at a higher rate than income saved.

SECTION IV

Two possible objections to the proposals

13. Any number of ends of policy in addition to the three mentioned above, may be brought forward ; and the greater the number of ends taken into account the more complete, but the less clear, will the treatment become. Which particular ends are esteemed

¹ Regarding the possibility of constructing an income tax from which savings are exempt see Pigou, *A Study in Public Finance*, p. 143 f. ; Irving Fisher, "Income in Theory and Income Taxation in Practice", *Econometrica*, 1937 ; and a simplified account of this, "A Practical Schedule for an Income Tax", *The Tax Magazine*, July 1937.

sufficiently important to be selected for discussion, will depend on the system of valuations of the individual concerned. If we have regard to more than the three ends of policy which we have mentioned, it will be found that the changes which we have recommended in the British system of public finance have other advantages and disadvantages which have not so far been taken into account. We wish to draw attention to two disadvantages of the changes. The first relates to a possible state of war.

In time of war the higher the level of taxation existing at the commencement of hostilities, the less scope there is for additional taxation for specifically warlike purposes. If the Income Tax at the beginning of the war is 6d. in the £, and is increased to 1s., the tax yield will, if the administrative system is as efficient as that of Great Britain or the United States, almost double. But if the Income Tax were to be raised from 6s. to 8s. in the £, through "avoidance", *i.e.* the more intensive search and use of loopholes in the law to escape tax payment, and through illegal evasion, the increase in yield of the tax would be by less, perhaps much less, than 33 per cent. A Government which commences a war with a high level of income and other taxes, will experience more difficulty in raising its tax revenue than one which starts off with a lower level of taxation.

Great Britain, in this respect, was fortunately placed at the beginning of the Crimean War, the Boer War and the Great War: the rate of Income Tax at the beginning of each of these was low and the yield of the tax responded excellently to rise in rate, providing a powerful instrument of war finance. This is seen very clearly in Table IV:

TABLE IV

HEIGHT AND YIELD OF THE BRITISH INCOME TAX AT THE BEGINNING AND END OF THREE WARS

	Height of Income Tax	Yield of Income Tax
	(i) at Beginning, and (ii) at End of War	(i) at Beginning, and (ii) at End of War
Crimean War	(i) 7d. in £ (ii) 1s. 4d. in £	(i) £8·3 millions (ii) £16·0 „
Boer War	(i) 6d. in £ (ii) 1s. 3d. in £	(i) £18·0 „ (ii) £38·8 „
Great War	(i) Standard rate 1s. 2d. in £ (ii) Standard rate 6s. in £	(i) £47·2 „ (ii) £291·2 „

Should another war occur, Britain will be less favourably situated in this respect than in the past. So also, we may reflect, will the other countries concerned, for a rising level of taxation has been true of all countries since 1914; and this may rob our present high level of taxation of some of its danger. But not of all, for perhaps in the future only democratic countries will rely on the income tax as a main instrument of war finance, while totalitarian countries will have other means open to them.

If we look at the problem in its economic aspect, clearly the necessity which confronts a country in time of war, is to place as large a proportion as possible of its productive resources to the manufacture of war-like goods — the total resources of the community, we may safely assume, will be employed in time of war in one fashion or another.

The effect of an income tax is to transfer a larger proportion of the community's income to the poorer people, the transfer being partly direct, by transfer

of income (as in old-age pensions), partly indirect, by extension of the other social services (*e.g.* health services); and it is much more difficult for a government to bring about a reduction in the standard of living of the masses of the people, by curtailing social services say, or in any other manner, than it is for it to reduce the standard of living of the small number of rich people. The economic problem involved in carrying on a war, therefore, is much more intractable if there is a high level of income tax in force at the beginning of the war, than if the rate of income tax had been low. Likewise the financial problem is more difficult, for there is less slack in the tax system, which could have been taken up by raising the rates of income tax and of other taxes.

A democratic country with a high rate of income tax, might resort, in the early stages of a war, if it were able, to measures of inflation, while trying at the same time to keep money wage rates constant. This would reduce real wage rates of the workers and inflate profits, which could be transferred to the Government by the existing (or better still, higher) rates of income tax, and by Government loans. A democratic country might be able to carry this out if its Government were "strong" and the country united in its view of the needs of the situation. For it to be able to do so, the working classes of the country would have to be persuaded of the equity of the tax system and its efficiency as a means of preventing the rich from profiting at the expense of the other sections of the community.

14. We can now amend the conclusions we had reached before this in discussing the ends A, B and C, and say that if it is believed that there is a good

chance of the occurrence of war in the future, and if efforts at inducing general disarmament end in failure, then rearmament and not extensions in the social services will be the main need. The end A for the time being loses much of its importance. In that event the analysis we had previously given will have established the alternative conclusion that higher rates of Income Tax and Sur-Tax than those existing in 1937-38 in Great Britain, could be imposed to finance the rearmament; and that this could best be done under a system in which income spent was taxed more heavily than income saved.

This would avoid the need to issue loans to rearm. The power to issue loans (home or foreign) should be held in reserve and at its full strength until the occasion for using it in war itself arose, if it did arise. Indeed, to foster instead of impair the ability to raise fresh loans, it might be of advantage to the country, while rearming, to pay off small quantities, even though they were only very small quantities, of the National Debt: the psychological impression that this left on potential subscribers to the Government's war loans might greatly repay the effort. The policy which it appears to us ought to be followed, in financing rearmament, therefore, would be very different from that adopted by the British Government in the period after 1935.

Furthermore, in the system we recommend, in which saving and expenditure are taxed at different rates, there would be a much closer scrutiny than at present into the income situation of the individual: and this during the war might enable some sort of conscription of wealth to be made and not of manpower only, as in the past. After the expiry of

hostilities, when the effort was being made to "get back to normalcy", the statistics of income in the hands of the Government might yield very useful results if it were desired to make a levy on war wealth.

15. Next, it may be that a policy of increasing the Government's total tax revenue — and this is the policy which we advocate — will make a further objective of policy more difficult to realise, that of stability of the economic system and its freedom from periods of great unemployment.

Robbins says: "It is at least arguable that, in a free economy, the higher the proportion of the national income which goes as taxation, the greater is the probability of fluctuations in yield and the greater, therefore, the probability of disturbances in the running of the national economy arising from such fluctuations. It is all very well to say that with a properly planned budgetary system these disturbances need not arise. The fact is that even the best of budgetary plans are likely to go wrong and that the larger the budget the more difficult it is to forecast what happens independently of the budget. The experience of the last few years in the United States and elsewhere seems to suggest that, once budgetary expenditure reaches a certain status in the national economy, it tends to supplant other forces as the pace-maker of the whole system: the independence of the free forces is suspended".¹

Morgenstern states forthrightly: "It has become apparent in the present world-economic crisis that one of the principal factors making for its protracted

¹ Robbins, "The Long-term Budgetary Problem", *Lloyds Bank Monthly Review*, April 1938, p. 164.

duration lies in the extraordinary height of State budgets and social charges".¹ But Morgenstern's expression of opinion is more definite than is justified by the present state of theorising on this problem.

The argument lying behind these expressions of opinion is that in times of trade depression a given system of taxes yields a lower revenue to a Government.² The incomes of those dependent on it, *e.g.* old-age pensioners, builders of roads and naval vessels, teachers, etc., will, therefore, fall off to some extent; while the effort to partially restore their incomes to their former levels will lead to some increase in the rates of taxes levied. At such a time the depression is deepened from the side of demand by the reduced incomes of the government dependents; and, if the Government attempts to balance the budget by extra taxation, the depression is further deepened by the rising taxes making conditions more difficult for entrepreneurs.

Again, the greater the amount of its normal tax revenue and public expenditure, the more difficult and dangerous will be the expedients to which the Government will be pushed; for example if it decides to run a budget deficit, this deficit will be the larger. In truth, during the next, and perhaps during the next two or three depressions, no one can feel perfectly certain which policy a Government placed in these circumstances would be best to follow; it may require the occurrence of a number of trade cycles and depressions before economic theory on the topic and Government practice emerge successfully from

¹ O. Morgenstern, *The Limits of Economics*, p. 98.

² During a trade depression the yield of an income tax falls off in a particularly great degree.

the test of experiment. In the next depression there will be disagreement as to which policy ought to be followed, doubt as to which policy *will* be followed, and doubt as to the results that the policy selected will produce. When there is so much doubt concerning budgetary policy, and the quantities involved are very large, the economy runs grave risks of meeting difficulty and frustration. Hence, the argument concludes, the greater the amount of revenue raised in taxation, and spent by a Government in its normal budget, the greater will be the difficulties which the community experiences in trade fluctuations.

As against this line of reasoning we must take into account some arguments of Keynes, who believes¹ that one of the causes of a trade depression is to be found during the period of the preceding boom, when the rich, out of their rising incomes, attempt to save more money than that quantity for which, at the existing level of consumption, it is possible to find investment opportunities. The larger the height of the direct taxation in the country, the greater will be the proportion of the national income which finds its way into the pockets of the poor; and the attempt to over-save will be less strong, with smaller dangers of reaction towards a slump. This is the opposite view to that of Robbins and Morgenstern.

Which of these two views of the matter is, on balance, the more important, cannot be said categorically. It may be that with the object of diminishing the intensity of trade fluctuations, a higher level of taxation will be an advantage; or it may be a disadvantage. Even though, however, it were to be agreed that it is a disadvantage, the present author

¹ *The General Theory of Employment, Interest and Money*, p. 321.

would still feel impelled to advocate a secular rise in the height of income taxation in Great Britain, with the object of financing the social ends which have been mentioned.¹

¹ See also the note on budgetary policy in the trade cycle, *infra*, p. 307.

IV
ADDITIONAL PROBLEMS

CHAPTER XIX

THE THEORY OF DOUBLE TAXATION OF SAVINGS

1. THIS theory was given its present form by John Stuart Mill.¹ It seeks to show that in the case of a general income tax from which savings are not specifically exempted, savings are taxed twice as compared with income spent, which is taxed once only. We quote the famous passage in which Mill sets out this view :

“ Unless savings are exempted from income tax, the contributors are twice taxed on what they save, and only once on what they spend. A person who spends all he receives pays 3 per cent to the tax, and no more ; but if he saves part of the year’s income and buys stock, then in addition to the 3 per cent which he has paid on the principal, he pays 3 per cent annually on the interest itself, which is equivalent to an immediate payment of a second 3 per cent on the principal. So that while unproductive expenditure pays only 3 per cent, savings pay 6 per cent : or more correctly, 3 per cent on the whole, and another 3 per cent on the remaining 97.”²

Irving Fisher gives the theory an interesting formulation by selecting the case of three brothers A, B and C, each of whom has a different attitude to savings.³ A is a spendthrift ; he spends his

¹ Its earlier history is traced by MacGregor, “ Taxation of Savings ”, *Economica*, 1936.

² J. S. Mill, *Principles of Political Economy*, edited Ashley, pp. 813-14.

³ Irving Fisher, *The Nature of Capital and Income*, p. 250.

money at the rate of £2000 a year and so his fortune lasts only six years. B adopts the conservative policy of spending only the interest on his money, maintaining the capital intact. While C lets interest accumulate at 5 per cent on his fortune for fourteen years, and thereafter is able to derive from it a perpetual income of £1000 a year, instead of £500 a year as does B.

If a flat rate tax of 10 per cent exists, of these three brothers, Fisher shows, A, the spendthrift, could compound for all his tax payments by making a payment of £157 at the time when he inherits the fortune. To compound similarly, B would have to pay £1000; and C, the most careful of the brothers, would require to offer a payment at the same date of £1714. Under such a system, says Fisher, savings are penalised.

Pigou also upholds the view set forth above. His treatment is directly in the tradition of Mill; and, since the whole theory, and discussion of it, tends to revolve round subtleties and the meanings of words, we give the passage from his works:

“An income tax . . . differentiates against saving, by striking savings both when they are made and also when they yield their fruits. Thus, a general permanent income tax at the rate of x per cent strikes the part of income that is spent at this rate. But, if £100 of income is put away for saving, it removes $£x$ from it at the moment, and, thereafter, removes also some part of the fruits yielded by it. . . . Let us suppose that the saver's investment is a permanent one, so that the principal is never withdrawn. Then the secondary taxation amounts every year to $x/100$ ths of the fruit of the $£(100 - x)$ that are actually turned

into the investment. The total effective rate of tax per cent is, therefore, $[x + x/100 (100 - x)]$; that is, $x(2 - x/100)$. Thus, the effective rate on saved income is practically double the rate on spent income when the tax is small.”¹

2. The theory which we have summarised, however, would seem to be unsatisfactory. If we accept the proposition that money saved is taxed twice as compared with money spent on consumption goods, then, since taxation reduces a capital sum of £100, if it be spent on consumption goods, to £(100 - x), adopting Pigou's terminology, we should expect that in the case of money saved it would reduce the capital sum to £(100 - 2x); or, in the more exact form, to £(100 - 2x + x²/100). *This we know it does not do. £100 on which income tax has to be paid has the same capital value, whether the money taxed is destined to be devoted to consumption purposes or to savings.* If the money is to be devoted to consumption purposes, the net capital value of £100 to its owner will be £(100 - x); and if the money is to be saved, the net capital value of £100 to its owner will likewise be £(100 - x).

Thus the theory that money saved is double-taxed, is unsatisfactory at this point.

It is mainly on this ground that Guillebaud likewise dissents from the theory that savings are double-taxed. He puts it thus :

“ If a man has saved £100 and placed it on deposit in his bank the value of his holding continues to be £100, irrespective of whether he pays no income tax at all, or income tax at the rate of 2s. 6d. or 5s. in the £. The opposite view would lead to the absurd result that the investment of £100 is no longer worth

¹ Pigou, *A Study in Public Finance*, p. 139.

£100 the day after it has been made, but some smaller sum."¹

Ricci has said (if we put "£" in his argument instead of "a loaf of bread" so as to bring out the meaning of the passage): when a new tax has been levied, "*Nothing has altered as regards the rates of exchange between £'s that are to be consumed and £'s that are to be saved: one £ which is to be consumed immediately, is always worth one £ which is to be saved*"².

3. Can a more satisfactory view of the facts be advanced in place of the theory of double taxation of savings? A theory in the following terms would seem to be a preferable way of regarding the whole matter.³

Suppose an individual to earn £200, £100 of which he spends on consumption goods and the other £100 he saves. Let i per cent be the rate of interest he receives on the money he saves and invests: since he has got to pay income tax on the interest he receives on this money, let us refer to i per cent as being the gross rate of interest. The net capital value to the individual of the £100 which he spends on consumption goods is £(100 - x).

From what we have said in criticism of the theory of double taxation of savings, this also must be the net capital value to him of the £100 gross which he saves. It comes about in this fashion. The gross rate of interest is i per cent. But, since, of every £ i that a

¹ Guillebaud, "Income Tax and the Double Taxation of Savings", *Economic Journal*, 1935, p. 486.

² Ricci, "La taxation de l'épargne", *Revue d'Économie Politique*, 1927, p. 879.

³ See Ricci, *art. cit.*; and more particularly his article "L'imposta unica sui consumi non necessari", *Giornale degli Economisti*, 1913.

person receives as interest on the money he saves, he must pay x per cent, *i.e.* $\text{£}ix/100$, in the form of taxation, the *net* rate of interest that he receives after the tax has been imposed, is $(i - ix/100)$ per cent. Each year he will receive on the gross capital of $\text{£}100$, or net capital of $\text{£}(100 - x)$ which he saves, a *net revenue* of

$$\text{£}(100 - x) i \left(1 - \frac{x}{100}\right) \frac{1}{100}.$$

A net revenue of this amount capitalised at the net rate of interest mentioned, will be (since we are simply reversing the last step in the reasoning)

$$\begin{aligned} \text{£} \frac{(100 - x) i (1 - x/100)}{100} \frac{100}{i (1 - x/100)} \\ = \text{£}(100 - x). \end{aligned}$$

This view of the matter appears to be more free from misleading implication than the theory that saving is double-taxed.

Again, different individuals in the community — whether this community be that of real life and graduated taxation, or else the hypothetical community that we envisage — will be required to pay income tax at different rates. Another individual, for example, may be required to pay tax at the rate of y per cent. The net value of a gross income of $\text{£}100$ to him, whether he saves it or spends it, will be $\text{£}(100 - y)$: the net rate of interest on it, should he save it, is $i (1 - y/100)$ per cent. But this introduces no new complication into the theory.

4. The view of the facts stated can be illustrated by a diagram.¹

Still thinking in terms of the individual who

¹ Ricci, *art. cit.*, *Giornale*, § 14.

obtains an increment of income of £200, and pays income tax on it at the rate of x per cent, let OA , AB in the diagram each represent £100. Let CB , DA each = £ x . Measuring time along the horizontal axis, let $O1$ equal one year, 12 equal another year, etc.

The capital value of the £100 which the person consumes, is, after the tax, equal to AC .

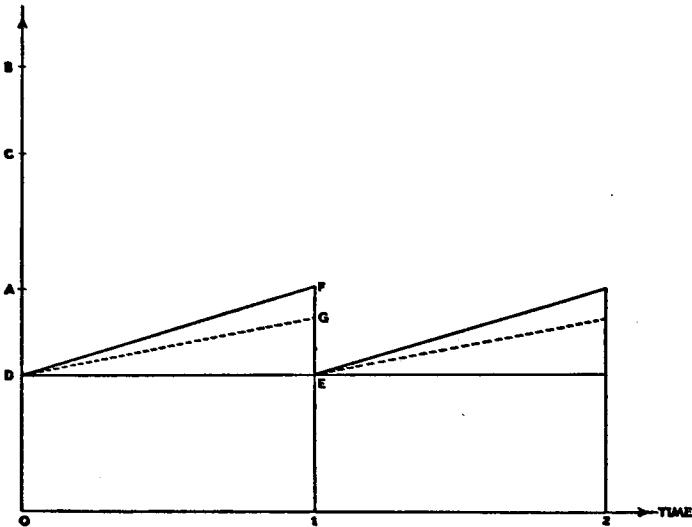


DIAGRAM I

If the gross rate of interest is 5 per cent, let DE be drawn parallel to the time axis and make EF equal to 5 per cent of OD and GF equal to x per cent of EF . (We are assuming simple interest to be paid on the capital sum; the case where interest is reckoned at a compound rate needs only a small adjustment.)

In the diagram the net capital value of the £100 which is saved, is, after the tax, equal to OD (which is equal to AC). It is shown to be growing at the

gross rate given by the slope of DF, but at a net rate given by the slope of DG.

At the end of the first year, the person, if he choose, may consume EG, the net interest on the capital, leaving the capital value IE at that moment of time, the same as it had been to begin with ; and the whole process can be repeated in the second, third and following years. This would be represented by placing a succession of geometrical figures similar to the first, in order along the axis of time. (See diagram I in which one additional such figure is shown.)

5. Pigou speaks of an income tax from which savings is not exempted, as differentiating against saving and in favour of spending.¹ He is envisaging a case such as that of a community in which a tax of 10 per cent is imposed, and in which prices and incomes remain unchanged. This reduces a gross income of £1000 to £900 if the money be spent : but if the money be saved it reduces the sum invested to £900, and *in addition* reduces the interest on it from 5 per cent, say, to 4.5 per cent.

Yet even in this, the most definite instance that can be cited in favour of retaining the title " double taxation of savings ", the *economic significance* of what takes place is obscure ; sufficiently vague and obscure indeed, as to render any title so definite as double taxation misleading in the definiteness of the phenomena that it suggests.

Let us consider the tax of 10 per cent just cited. As a result of it, an individual will cut down both the amount of his saving and the amount of his expenditure. He may cut down the amount of his saving more than the amount of his expenditure : or

¹ *Op. cit.* p. 140.

the reverse may be the case. There is nothing in theory to suggest that either of these two alternatives is the more likely. As much as we can say, is that it has been the prevalent view that the supply curve of savings, over the relevant portion, slopes upward; so that the average individual will save less when there is a fall in the net rate of interest on his savings. There will be some individuals, it is true, who are in the opposite case from this: *e.g.* a person who is saving to purchase an annuity of given amount will now require to save a larger capital sum than he formerly would have done. But individuals of this kind, it is generally believed, will be the exception. Only, as we have said, theory does nothing to suggest whether for the average individual and for the community as a whole, the contraction in the amount saved or in the amount spent on consumption goods will be the greater. If it were to be the case, that, when the tax is imposed the amount saved by the community as a whole, falls in a less proportion than the amount spent on consumption goods, would it still be considered desirable to retain the title "double taxation" of savings as compared with income spent? One would, at any rate, use the title with less assurance, than if the reverse had been the case.

6. Quite independently of the reasons given, a further set of reasons exist, quite different in nature, some of which in themselves might well be considered of sufficient importance for discarding the theory that saving is double-taxed. This is because the theory of double taxation has a number of different aspects. The aspects of which we have just treated may be referred to as the accounting aspect and some portions of the theory in its economic aspect. Other portions

of what may be broadly termed the economic aspect of the theory, have been dealt with earlier in the text, where we consider the effect of the income tax on population, the volume of capital and some of the other main economic variables.

But, in addition, the theory has what may be termed an interpretative aspect and a moral aspect. The interpretative aspect of the theory, which is a logical or analytical aspect relating to the meaning of words, analyses the nature of the capital, of the interest, and of the tax concerned, in such a way as to bring out the manner in which saving is or is not double-taxed. Some writers put forward a very elaborate interpretative scheme. Einaudi does this to show that saving is double-taxed: De Viti does it to show that saving is not double-taxed.¹ Criticism of the interpretative aspect of these theories need not be given here. The interpretative aspect of the view we have put forward, emphasises that money saved is not taxed twice, but that what happens is that the money saved is taxed once, and that then the interest on it, which represents new wealth produced at subsequent periods of time by means of the savings, is also taxed. This view is illustrated by diagram I, which shows the nature of the process that takes place through time; it shows the amount of capital, the rate of gross interest and the rate of net interest, at each moment in time.

7. Of the writers whose views we quoted, holding that saving is double-taxed, for example, Mill, Fisher and Pigou agree that it is morally undesirable that

¹ See Einaudi's main writings on the subject, "Intorno al concetto di reddito imponibile e di un sistema d'imposte sul reddito consumato", *Memorie della Reale Accademia delle Scienze di Torino*, 1912, and "Ottima imposta", *cit.*; and De Viti de Marco, *op. cit.*, Book II, chap. 10.

savings should be taxed more heavily in this way, than money spent.

J. S. Mill says, "No income tax is really just from which savings are not exempted".¹

Fisher speaks of taxation of this kind being "inequitable taxation — double taxation to the saver and remission of taxes to the spendthrift".²

Pigou says that an income tax from which saving is not exempted, is inferior from the standpoint of least sacrifice to one from which saving is exempted.³

On the other hand, De Viti, who considers, from the point of view of analysis, that there is no double taxation, likewise considers that there is no moral problem of how to exempt savings from taxation.

These and other examples which might be given of this coincidence of economic and moral viewpoint, suggest that the two strands of reasoning, the moral and the analytical, have not been held as separate from one another as would be desirable. Clearly, however, in so far as the theory of double taxation of savings is a purely economic theory, it should be quite possible to take the view that no double taxation exists, and yet to affirm that savings ought to be less heavily taxed than under a certain given system of taxation; or, *vice versa*, to hold from the analytical point of view that double taxation of savings does exist, but that morally the situation is quite satis-

¹ *Op. cit.* p. 814.

² *Op. cit.* p. 255.

³ *Op. cit.* p. 142.

In the case of Einaudi's work it is not the aim of this author to show that savings *ought not* to be taxed. Einaudi employs the theory of double taxation of savings as a means to a general discussion of the problem of taxation. See Fasiani, "Sulla teoria dell' esenzione del risparmio dall' imposta", *Memorie della Reale Accademia delle Scienze di Torino*, 1926, p. 1, footnote; and Benham, "Notes on the Pure Theory of Public Finance", *Economica*, 1924, p. 445 f.

factory. The coincidence of the economic and moral judgment in most discussions, suggests some confusion between the two aspects. In itself, the title "double taxation of savings" is far from being the purely neutral and scientific term which it is so needful to have in economic analysis. The term suggests ethical consequences to the mind: and this in itself would be an argument against its use.

8. The formulation alternative to accepting the theory that savings are double taxed, which we have given in the preceding pages, is due to Ricci; yet in the most recent article in which he sets forward his views on the matter, that writer leaves himself open to certain criticisms.

In it, Ricci speaks as if the State aided in the creation of the new wealth produced by means of the savings, *and therefore as of right* claimed a share in such new wealth by way of the income tax.¹ He commences his analysis with an hypothetical case in which a railway is conducted by private enterprise and charges traders for the services it renders. Then the railway is taken over by the State, which charges the same amount as before for the same services as before; but this time the charge is made by means of the income tax. This tends to introduce the implication that it is right that the State should levy such a tax, including a tax on the yield of savings.

Argumentation of this kind is unnecessary, and when introduced can hardly help being misleading. It would be desirable that all the relationships pointed out in economic analysis should be purely neutral and scientific; that is, they should be state-

¹ *Art. cit., Revue, 1927, p. 864.*

ments of quantitative relationships existing between different economic variables.

The second objection to Ricci's argument would relate to its form, but not to its substance: sometimes moral aspects of the question are introduced in the middle of a piece of economic analysis. The effect on the mind of the reader is not clarifying.

Both of these objections attach also to the discussion of double taxation given by Guillebaud, who, after he has given the matter some consideration, states the conclusion that "to exempt savings from taxation would be to differentiate unfairly against the non-savers, whose burden of taxation would become correspondingly heavier".¹

It might be argued in favour of Guillebaud's treatment that he has already, earlier in the article, dealt with the economic analysis of the problem; and that having thus examined the issue he now states his moral judgment upon it. To some extent this may be true and would afford some justification of Guillebaud's treatment. Yet on the whole, I think it would fall short of a complete justification. The aim of economic analysis, as Robbins points out, should be to show all the implications of each choice of policy.² And it is only after he has expressed this moral judgment, that Guillebaud goes on to consider the effects of an income tax on total income and on income spent respectively, on the rate of interest, and, by implication, on prices and on distribution. Logically, such analysis, designed to show some of the major results of the different possible lines of

¹ *Art. cit.* p. 490.

² Cf. Robbins, *The Nature and Significance of Economic Science*, chap. vi, Section 5.

policy, should, I think, come before the expression of the moral judgment on the question. This criticism may appear to be hair-splitting. But in practice the admixture of economics and ethics, which is so frequent in the subject, is undoubtedly retarding the progress of the science of public finance.

Guillebaud introduced a conception of the State similar to that held by Ricci, both authors in this point following De Viti.

"The State", says Guillebaud, "through the exercise of its general function as a co-operating factor in the productive organisation of the community, and through the expenditure of the revenue which it receives from the taxpayers, will increase the productivity of the capital accumulated by the action of the savers above what it would have been in the absence of the State. The State is accordingly entitled to a share in this additional income."¹

This conception of the State in public finance is not a tenable one. Reasons for rejection of the concept need not be given here, beyond showing its unsuitability by a single example. Suppose that the State raises the rate of income tax in order to increase the pensions given to old people. No necessary increase in the productivity of the factors employed in production need result. A more purely scientific view of the State is needed than that advanced by De Viti, and accepted here by Ricci and Guillebaud.

9. Finally some criticism may be attempted of Professor MacGregor's paper "The Taxation of Savings", in particular as regards his interpretation of the argument of J. S. Mill. To quote from MacGregor's argument :

¹ *Art. cit.* p. 489.

“ Mill says that if a tax of R per cent is imposed on an income, part of which is going to be saved, the result will be that the taxpayer will reduce both his expenditure and his savings by exactly R per cent. This assumption is *essential* to his argument. . . .

“ I do not understand why none of his critics have pointed out this obvious and quite disqualifying objection to his formula, which is thereby at once dissolved.”¹

After a perusal of the relevant portion of Mill's work, I am unable to agree that Mill either states or suggests that when a tax is imposed on income each person will cut down the amount of his saving and the amount of his consumption by the same percentage. Nor does Mill's argument appear to me to rest on such an assumption, any more say, than Professor Pigou's does.²

I think, in this same regard, that Professor MacGregor is rather unfair to Ricci. In the article of Ricci's that MacGregor cites,³ it is true that a long algebraic example is used in which each one of a large number of persons is assumed to cut down his saving by 10 per cent and his consumption by 10 per cent, owing to the imposition of a tax. The reason for this, however, if I understand it rightly, is not because the assumption is necessary to the argument, but only because it simplifies the arithmetic. In the article, Ricci says, before proceeding to discuss an arithmetical example that had been given by Einaudi :

¹ *Art. cit.* p. 391.

² Professor Pigou has replied in similar terms to the criticism of MacGregor, *Economica*, 1937.

³ MacGregor, *art. cit.* pp. 400-401. ‘ Ricci, like Mill ’, says MacGregor, ‘ believes that an income tax will diminish savings and expenditure by the same percentage.’

“ Si un *nouvel* impôt général sur les revenus de 10 p. 100 survient, il frappe Titus en lui enlevant 1,000 francs ou pains. Quelle répercussion exercera ce nouvel impôt sur la distribution que fait Titus entre consommation et épargne ? La question est importante et sera analysée tout à l’heure, mais ici, pour la discussion de l’exemple d’Einaudi, elle n’a pas d’intérêt.”¹

Later he points out that :

“ Dans une étude que j’ai récemment publiée, j’ai montré comment, sous certaines conditions, une *diminution* dans le taux d’intérêt peut induire un *homo oeconomicus* à *augmenter* son épargne.”²

When we are dealing with a large number of people, however, he considers it probable that the imposition of a tax will lead to a fall in the amount of savings supplied and so cause a rise in the rate of interest.

Moreover, in the earlier article,³ in which Ricci had developed his views on double taxation more fully than he does in the later article, he makes no reference whatever to the assumption to which MacGregor refers. Ricci’s investigation, therefore, appears to be more general in its scope than Professor MacGregor considers it.

MacGregor, further criticising Mill, says :

“ Mill’s formula leaves unanswered a serious inference from it.

“ That inference is that the Government must be getting more taxation than it requires. For, if the rate of taxation is R per cent, and this represents

¹ *Art. cit.*, *Revue*, 1927, p. 878.

² *Ibid.* p. 881. (Author’s own italics in both quotations.)

³ *Giornale*, 1913.

the cost of the public services, then R per cent of the expenditure, plus nearly twice that proportion of the savings, is more than R per cent of the whole income.

“ I see no escape from an impossible conclusion, so long as we adhere to what Mill and other supporters of his argument actually say.”¹

Again I would be unable to agree that Mill anywhere expresses this meaning. Rather, what he has in mind, it appears to me, is that the Government raises by taxation just as much money as its public expenditure requires; but that a larger portion of its revenue is traceable to moneys that have been saved than is traceable to moneys that have been spent (that is, in so far as its revenue is derived from a general income tax). Money earned at the present moment, say, and spent at the present moment, is only taxed once, viz. at the present moment; yet if this money had been saved, it would have yielded fruits which would have been taxed again at later dates. Thus *in this sense* money saved seems to bear more taxation than money spent. If this in fact be Mill's meaning, then he does not commit the confusion in thought to which Professor MacGregor alludes.

Frequently in the course of his discussion MacGregor alternates between arguments that are economic in their nature and others that are moral. This alternation we have held, has an obscuring effect, and we have made a plea for the clear distinction between arguments of these two kinds.

¹ *Art. cit.* p. 393.

CHAPTER XX

CO-OPERATIVE SOCIETIES AND THE INCOME TAX

SECTION I

The economic effects of taxation of co-operative reserves

1. THE main controversy at the present time in relation to the taxation of co-operative societies, centres round whether or not the sums placed to reserve by these societies should be subject to Income Tax. Before 1933 such sums placed to reserve were not taxed. In that year a Committee was appointed under the chairmanship of Mr. W. H. Raeburn to inquire into the matter and make what recommendations to the Government it thought suitable. The Committee recommended that moneys placed to reserve by co-operative societies should be taxed at the standard rate of Income Tax: and legislation was introduced into Parliament by the Chancellor of the Exchequer, Mr. Neville Chamberlain, giving effect to this recommendation.

2. First, let us consider the changes in the prices of the goods and the quantities of the goods they sell, that will be brought about by taxing co-operative reserves at standard rate. Here it is easy enough to reason in realistic terms, and with regard not to a stationary community, but to a progressive one such as Great Britain in the twentieth century. The volume of retail trade and other trade in the community is increasing. The larger the reserve made

by any firm in this developing community, the greater will be the rate of increase in the amount of its trade.

The effect of subjecting the reserves of co-operative societies to taxation, will be that, in any year either smaller sums of money will be placed to reserve, or else less "divi"¹ will be paid to members, than would otherwise have been the case. Or, more likely, the loss sustained through having to pay Income Tax on reserves, will lead to both smaller sums being placed to reserve by societies and smaller sums being paid out in "divi".

The lessened rate of accumulation by reserve will entail, after the lapse of a period of time, a smaller business organisation, a lesser volume of trade and a smaller number of members. The reduced rate of "divi" paid, will also lose the society members and custom.

Alterations brought about by the new tax measure, in the prices which societies charge for their goods, are likely to be small. The policy followed by most societies, is to charge the same prices for their goods as are charged by the retail stores with which they compete. The prices in these concerns will not be affected by the tax change: neither, therefore, will prices in the stores of their competitors, the co-operative societies.

Trading will be carried out at an unaltered price level; but the volume of trade of the societies will contract with lapse of time. This appears to be going to be the main result of the tax legislation.

In districts where the volume of trade done by

¹ The refund to members is referred to as "divi" to distinguish it from dividend payments on shares.

co-operative societies is an appreciable fraction of the whole, the effect on prices may be for a rise to take place in the short period, both for co-operative stores and for other retail shops. But if, stimulated by the higher level of profits, new capital flows into retail trading in these districts, the price rise will be wiped out both for the societies and the retailers.

A closer view of the retail market would discover that often there is not complete price uniformity as between co-operative societies and retail stores. Some co-operative societies make it their policy, in order to increase their rates of "divi", to sell price-maintenance goods at the same prices as other shops, since they have to guarantee to do this before they will be supplied by the makers; but goods with no fixed prices the co-operatives sell at a little dearer than others. Perhaps the margin between the prices charged by co-operatives and the prices charged by others, for goods whose prices are not stipulated by the makers, will widen in the future, as a result of the taxation of co-operative reserves. Raising prices in this way would help to keep both "divi" and reserves nearer their old levels (or the levels they would have had, had no tax been imposed), even though the societies carry a new tax burden.

Other co-operative societies to-day, sell price maintenance goods at their fixed prices and other goods at lower prices, although this is done at the expense of lower rates of "divi". The margin between these lower prices and the prices charged by outside sellers, will probably in some cases be gradually reduced as a result of the 1933 tax legislation. In this case also, small price increases in goods sold by co-operative societies will have resulted.

Each price increase, and each fall in rates of "divi", will tend to lose the societies a certain amount of custom. A practical problem for the managements (and annual general meetings) of the societies, will be whether to make the adjustment to the new tax situation by raising prices, or by reducing "divis", or by reducing allocations to reserve. No policy of price alteration can avoid the tax payment: so long as the societies place moneys to reserve, tax must be paid.

SECTION II

Is it just to tax co-operative reserves?

3. The position of the societies in regard to Income Tax.

The following table, which is convenient for reference, sets out the position in regard to Income Tax, of co-operative societies as it had existed before 1933: the table is one furnished by the Board of Inland Revenue in their evidence before the Raeburn Committee and reproduced in its *Report*.

As it does not appear in the table, it is well to add that before (and after) 1933, dividends paid by co-operative societies to shareholders have been liable to Income Tax at rates depending on the liability of the individual shareholder concerned; *i.e.* there is no deduction of tax at source.

The only change in the situation since 1933 has been, as we have explained, that money placed to reserve by the societies has been made liable to tax.

4. The constitution of co-operative societies.

The whole question of the equity of taxing co-

operative societies turns on the constitution of these societies. There are several kinds of co-operative society registered under the Industrial and Provident

INCOME TAX POSITION PRIOR TO THE LEGISLATION OF 1933

	Co-operative Society	Company
<i>Schedule A</i>		
Annual value of property owned and occupied . . .	Pays Income Tax	Pays Income Tax
Rents from property owned and let to tenants . . .	" " "	" " "
<i>Schedule B</i>		
Profits from the occupation of land . . .	" " "	" " "
<i>Schedule D</i>		
Interest on Government Stocks . . .	Exempt	" " "
Trading profits . . .	"	Pays Income Tax on excess of trading profits over Schedule A assessments on business property owned
Deposit interest and other interest received in full without deduction of tax (e.g. interest on 5 per cent War Loan)	"	Pays Income Tax
Dividends and interest on investments (e.g. shares, debentures, mortgages) . . .	"	" " "
Income from foreign securities or foreign possession . . .	"	" " "

Societies Acts, the two main being retail distributive societies and wholesale societies ; but we will speak as if we were considering only retail societies, since the case of the wholesale societies is exactly similar.

It appears that there also exist a number of societies registered under the Industrial and Provident Societies Acts and known as co-operative societies, which have nothing in common with these societies, and ought not to have the same legal status. But we disregard these bogus co-operative societies in the treatment of this chapter.¹

A retail co-operative society is financed out of two separate types of capital, share capital and loan capital. In terms of the Act under which these societies are incorporated, no shareholder can hold more than 200 £1 shares in a society. Any person can obtain as many up to 200 shares (or up to some smaller number depending on the exact terms of the articles of incorporation), in a society, as he wishes to purchase. On these shares interest is paid at a rate which is determined by the annual general meeting of the members of the society. This rate varies in rough accordance with the market rate of interest, or the rate obtainable on Government stocks. It hardly ever, even in a single instance, has risen above 5 per cent. During the years 1930 and 1931 the average rate paid on share capital was $4\frac{1}{4}$ per cent : by 1935 the average rate had fallen to $3\frac{1}{2}$ per cent.²

In addition, a co-operative society has another type of capital, loan capital, represented by sums of money lent to it by members. This money may be a

¹ See Carr-Saunders, Sargant Florence and Peers (editors), *Consumers' Co-operation in Great Britain*, p. 468.

² J. A. Hough, *Dividend on Co-operative Purchases*, p. 183.

direct loan to the society by a member, or may take the form of the accumulation of a sum of undrawn "divis"; or it may be a loan made to the society by a Co-operative Savings Bank. The rate of interest on loans of this type also varies in conformity with the market rate of interest.

We can look on the society as paying for its loan capital, a rate of interest no higher than that at which the capital is to be got elsewhere when the same good security is offered. Hence the people who lend this loan capital to the society, get a rate of remuneration on it that does not depend at all on the size of the society's profits. These providers of loan capital will be indifferent whether the society's profits or its reserves be increased at any time, or be diminished: they receive the market rate of interest on their money, so to speak, whatever happens: and payment to them is a first charge on the society's assets in case of bankruptcy. Their position is similar to that of the holder of a mortgage or a debenture.

5. Is it a surplus or a profit that the societies earn?

Those who believe that co-operative societies are undertaxed — or were before 1933 — usually represent the societies as earning *profits*, part of which they distribute to their members as "divi", placing the remainder to reserve. The societies themselves, stating the case against levying taxation on them, deny that they earn anything in the nature of a profit: what they earn, they maintain, is not a profit but a "*surplus*". The gains of the societies arise from the dealings of a number of members among themselves; and, they hold, a body of people

cannot make a profit out of themselves. Therefore such gains are not to be regarded as profits, but must be a surplus, the surplus of mutual trading.

The analogy that the co-operatives here seek to draw, is between, for example, what takes place when some members of a family render services to one another, but nevertheless (in the eyes of the Department of Inland Revenue) create nothing in the nature of a profit which is taxable. Or, if a dozen consumers join forces and buy a good, so that each gets his supply of it cheaper than he would do by individual purchase, then again (so far as the Department of Inland Revenue is concerned), nothing that is deemed to be profit arises.

The contention that the excess of receipts over costs of co-operative societies, is a true surplus in the sense of this analogy, has given rise to a great deal of wrangling. The contention was accepted as valid by the Departmental Committee on Income Tax of 1905; but the Royal Commission on Income Tax of 1920 rejected the notion, so far as the portion of the "surplus" placed to reserve was concerned — this part of the "surplus", the Commission held, was profit. Among economists Pigou¹ and the author of the chapter on the taxation of co-operative societies in the recent work edited by Carr-Saunders, Sargent Florence and Peers,² accept the idea of a surplus as being valid: while Stamp,³ Fay⁴ and MacGregor⁵

¹ "Co-operative Societies and Income Tax", *Economic Journal*, 1920, p. 157.

² *Op. cit.* pp. 467-8.

³ *Report of the Royal Commission on Income Tax* (1920), Reservation on pp. 166-7.

⁴ "Co-operators and the State", *Economic Journal*, 1933, p. 415.

⁵ "Profit and Mutual Trading", *Enterprise, Purpose and Profit*, p. 190.

reject the notion of a co-operative surplus, holding that it really is a profit.

A reservation to the *Report* of the Royal Commission of 1920, which is signed by Stamp and Sir William McLintock, says: "In our view the question whether the principle of 'mutuality' prevails to put the tangible results of human effort outside the category or working definition of 'profits' is one of degree. . . .

"Where the aggregation of individuals serving each other is very large, and they are for the most part unknown to each other, commercial methods and tests must prevail, and the element of mutuality becomes less dominant and too diluted to justify alone a plea for exemption from taxation. Moreover, the advantages tend to become averaged out, and to have no definite relation to the individual interest. Thus, the 'divi' on particular purchases has no necessary connection with the true surplus price charged thereon, and is only a rough adjustment to reach cost price over the trading as a whole."¹

The factors which Stamp and McLintock point out here, it is true, make it difficult to accept the idea of the existence of a co-operative surplus of the same kind as arises when a few friends agree to the joint purchase of a commodity. The contrary idea, however, that what the co-operative societies earn is a profit, is hardly more tenable. In so far as the co-operative profit is a return on capital, it is on a capital which has been accumulated out of co-operative reserves made in the past; and even though he wished, the individual member would be unable to obtain any cash equivalent in exchange for his

¹ Reservation *cit.* p. 166.

“share” of the capital involved. To some extent, also, the “profit” which the societies earn is a return on the good-will which they enjoy through the loyalty of their own members in purchasing from them. Thus, the resemblance of the co-operative surplus to the reward which the shareholder in a joint-stock company gets for exposing his capital to the risks of industry, is not very strong.

We ourselves do not propose to take any definite side in this question of whether or not the excess of co-operative receipts over costs is a surplus or a profit: it seems to partake of the nature both of a profit and of a surplus. We find, however, that it is possible to prove satisfactorily that even if the co-operative “surplus” is regarded as being a profit, still, moneys placed to reserve by the co-operative societies ought not to be taxed, if it is people’s incomes which we wish to make liable to the Income Tax. To develop this line of argument, therefore, we will speak as if co-operative societies earn profits and not surpluses.

It would still be open to those who believe that the co-operative surplus is a genuine surplus, and not a profit, to contend that concessions ought to be granted to the societies additional to those that follow from the argument which we will give.—but that would be another chapter of reasoning.

6. Respects in which the member of a co-operative society resembles, and respects in which he differs from, the shareholder in a joint-stock company.

A natural comparison to make is that between the co-operative society and a joint-stock company; and for simplicity let us compare the society with a joint-

stock company in which there is only one class of shareholders, ordinary shareholders. The society and the company must each incur certain costs for materials and labour in the conduct of its business. If the company prospers, and its profits increase, the wages that the workmen receive (in a competitive labour market) will remain unchanged: the people who benefit will be the ordinary shareholders — they are the “residuary legatees” to the whole series of transactions in which the joint-stock company is engaged, taking what is left of the total receipts after all costs necessary to the conduct of the business have been met. The whole of these profits need not be distributed in dividend payments to the ordinary shareholders: usually, part of the profits will be distributed and the remainder placed to reserve — but ownership of the reserve will really be vested in the ordinary shareholders, and moneys placed to reserve in the company will be imputable to each of them in proportion to his share-holding in the company.

In the case of the co-operative society, the residuary legatee can neither be the shareholder in the society nor the person who makes loans to it; for the reward of each of these is fixed independently of the amount of profit or surplus that the society makes. (See § 4.) The residuary legatee in the case of the society, therefore — *in so far as the analogy holds good* — will be the *member* of the society, who benefits or suffers according as the profit of the society rises or falls. The member comes into possession of part of this profit when “divi” is paid. The remainder of it, after distribution of “divi”, is placed to reserve; and this, too, would be attributable to the ownership of the individual members of the society. Just as the extent of

an ordinary shareholder's ownership in the reserves of the company would be regarded as being in proportion to the amount of his holding of shares, so the extent of the ownership of a member in the moneys placed to reserve by a co-operative society, would be taken to be in proportion to his rate of purchasing goods from the society. To repeat, the total profit of a society is distributed between payment of "divi" and allocation to reserve: the individual member's ownership in both of these, would, taking this view, be regarded as being in proportion to his rate of purchasing. We know that his receipts of "divi" are proportioned to this amount. Ownership in the moneys placed to reserve would be *imputed* to the individual member on the same principle.

At the same time, this view, which would regard the position of the member in a co-operative society as closely similar to that of the shareholder in a joint-stock company, is again not without its difficulties. A difference — perhaps a fundamental difference — between the shareholder in a joint-stock company and the member in a co-operative society, is that any money which the society allocates to reserve has the effect of increasing the value of the shares of each shareholder in it: but there is no benefit of this kind to the member of a co-operative society. The society's allocation to reserve may enable the member to get slightly higher rates of "divi" on his purchases in the future: but also the purpose of the reserve is generally regarded as being to increase the number of the people with whom the societies trade; in which case, as contrasted with the case of the joint-stock company, the benefits of the reserve, financially at least, do *not* go to the people making it. And, should

a member die, or cease to purchase goods from the society, neither he nor his heirs will get any financial benefits from the money that had been placed towards the society's reserve, instead of being distributed to him.

Despite the importance of these differences, we will speak as if we regard the position of the co-operative member in relation to his society as being identical with that of the shareholder in relation to the joint-stock company; and we will impute ownership of a society's reserve to the members in it. *This, like the view that co-operative societies earn profits and not surpluses, will represent the position of the societies, or their members, in the least favourable light, so far as claims for tax exemption are concerned.* We adopt this line of argument in order to find out the maximum amount of taxation to which the societies could, with any show of reason, be made liable.

7. The British or any other Income Tax ought to be levied on a person's income; and for the sake of clearness we may add, on the real income in terms of goods and services which he receives. This principle would appear to us to be impossible to controvert, and on it the rest of our subsequent analysis is based.

A person has an income of, say, £200 a year. Part of this he spends at a co-operative store which sells to him goods at the same prices, we will suppose, as they are to be had elsewhere. When he has spent his income of £200, the person has received value to the same amount. In addition, we will regard him as receiving from the co-operative society, a payment of "divi" equal to £10. This also he spends. His real income in all amounts to £200 plus £10 = £210.

The last £10 we have agreed to regard as being in the nature of a profit. It is on an income of £210, therefore, that the person ought to be assessed to Income Tax. Other things being equal, including the prices at which the societies sell goods, *co-operative "divis" ought to be taxed.*

8. Next, as to the moneys put to reserve by co-operative societies. We have agreed to regard the profit that arises in the trading of a society as belonging to the members, and imputable to each member in proportion to his volume of purchases. Each person, then, should be assessed to Income Tax on the total amount of income (making in reckoning his tax assessment whatever family and other "allowances" are legally in force), which accrues to him within the year. Part of such income is represented by the portion of co-operative profits that is to be imputed to him.

One portion of this profit imputable to him is "divi" that he actually receives. As we have just shown, he ought to be taxed on an income reckoned as including payments of "divi".

The other portion of the profit of the society imputable to him, takes the form of money placed by the society to reserve. The person ought, therefore — granted the premises of our argument — to be assessed to Income Tax at the rate legally appropriate to his particular circumstances, on a total size of income reckoned as including both "divi" and the sum of money placed to reserve in the society which is imputable to him.

The formal rule that we obtain here can easily be given concrete content. It was estimated by the Board of Inland Revenue that the proportion of

co-operators who, in the income-tax year 1919-20, were liable to payment of Income Tax, was about 9 per cent.¹ Let us take it that a tenth of all co-operators in the country are to-day liable to payment of Income Tax. From this it appears to follow that *a system of taxation like the present, which taxes moneys placed to reserve by co-operative societies, inflicts injustice on nine tenths of all the co-operators in the country.*

On the other hand, the present Act exempts "divis" from payment of taxation, which, we hold, ought to be taxed. Thus *a tenth of all co-operators receive an undue measure of exemption through the non-liability of co-operative "divis" to Income Tax.*

Does the error in one direction, over-taxation of co-operative reserves, roughly balance that in the other direction, under-taxation of co-operative "divis"? Or, to express the same question more exactly, Does taxation of the reserves place too great or too small an aggregate burden on the shoulders of co-operators?

The question, when posited in this form, is, however, incomplete; and to answer it would not really be very enlightening. This is so, because, while the total income or profit of co-operators is equal to the total of "divis" paid out, *plus* the total of sums placed to reserve, yet the co-operative societies already pay Income Tax — they pay under schedules A and B. (See above table.) And it may be that the burden of Income Tax which already for a long time has been borne under schedules A and B (the name of a schedule is in itself irrelevant), places a sufficient aggregate burden on the shoulders of co-operators considered as a group.

¹ *Royal Commission on Income Tax (1920), Appendices and Index to the Minutes of Evidence, Appendix No. 29, p. 143.*

Full materials for an answer to this broader question can be got from information provided by the Board of Inland Revenue in its evidence before the Raeburn Committee.¹ The figures relate to co-operative accounts for the year 1930, which would be used to calculate Income Tax liability for the budget year 1931-32, Income Tax liability being based on the trading results of the previous year.

The facts are as follows :

A tenth of all co-operators, as we have pointed out, are liable to Income Tax.

The standard rate of Income Tax for the year 1931-32 (Second Finance Act of that year) was 5s. in the £, but in the early stages of tax liability the rate was 2s. 6d. in the £. Now it is safe to assume that of all the co-operators liable to Income Tax, the large majority would be liable² at the lower of these rates. Hence, we can calculate the aggregate burden of taxation to which co-operators ought to have been liable on the income they derived from their societies, as a little over 2s. 6d. in the £ paid on one-tenth of all the income which accrued to them from the societies ; or, which comes to the same thing, a tax levied on the entire income at a little over one-tenth of 2s. 6d., i.e. at a little more than 3d. in the £.

Co-operators, therefore, will be able to claim with safety, that the aggregate tax burden of the societies should amount to a payment of very little over 3d. in the £ on the total profits (money paid out in "divis" plus money placed to reserve) made by the

¹ *Minutes of Evidence of the (Raeburn) Committee appointed to enquire into the Present Position of Co-operative Societies in relation to Income Tax*, p. 11.

² It is the marginal rate of tax liability of each individual that is of importance.

CH. XX CO-OPERATIVE SOCIETIES AND INCOME TAX 301

societies in that year. If we estimate the burden that ought to have been paid at 4d. in the £, this tax rate would correspond to a third of all the co-operators who are liable to Income Tax, paying at the rate 5s. in the £, and the remaining two-thirds paying at the lower rate 2s. 6d. in the £; and it will, beyond doubt, over-estimate what the aggregate tax burden ought to be. We will reckon how much the burden at 4d. in the £ would have amounted to, and compare it with the burden already borne by co-operators under schedules A and B :

All co-operative societies — profit for the year 1930 (amount paid out in “divis” plus sums placed to reserve)	..	£24,443,000
<i>Add back :</i> Excess of amounts written off for depreciation over amount estimated to be allowable for Income Tax purposes, and other non- allowable deductions (in- cluding allocations to re- serve) made in arriving at profit	£3,540,000	..
Income Tax, schedules A and B, paid by societies in the year 1930 and deducted in arriving at surplus	460,000	4,000,000
		£28,443,000

Now the contention to which our theory has led us, has been that if we were willing to place a heavier burden on the shoulders of some co-operators and a lesser burden on the shoulders of others, than there

would strictly be on a personal system of taxation, in such a way as to make the aggregate payment the same as it would be on this personal system, then this aggregate would amount to a smaller payment than 4d. in the £ on all profits made by the societies. An Income Tax of 4d. in the £ levied on a profit of £28,443,000 amounts to £474,000 ; but this is almost exactly the amount which co-operators were already paying under schedules A and B before the reserves made by the societies became liable to payment of Income Tax. *Hence we can conclude that so far as an Income Tax is concerned — if it really is income which it is intended to tax — co-operators and the co-operative societies had already been adequately taxed, and indeed probably a little overtaxed, before the legislation of 1933 was passed.* It follows that since 1933 the co-operative societies must have been grossly overtaxed.

In the first year of its existence the legislation passed by Mr. Chamberlain was retrospective ; it was payable on the moneys placed to reserve by the societies during the course of 1932, before they were aware that these sums would be liable to taxation. As a result of this, the amount of *additional* taxation to which the societies became liable in the financial year 1933–34 was £1,092,000. The first reaction of the societies to the new legislation was to contract the sums which they placed to reserve ; and in 1934–35 the amount of taxation on reserves payable by them was £557,000. A policy of contraction of reserves, however, quickly passed out of favour ; the gains which it brought in the short period were going to be at too great expense of long-run benefits ; and reserves, after their first period of contraction, promptly moved back towards their former levels.

Thus for the fiscal year 1935-36 and onwards, the amount payable by co-operative societies on sums allocated to reserve has been in the neighbourhood of £1,000,000 per annum.¹

9. The Raeburn Committee, like the Royal Commission on the Income Tax of 1920, reached the conclusion that sums placed to reserve by co-operative societies ought to be taxed at standard rate. On what grounds did it do so and wherein do its views differ from our own ?

The main reason given by the Committee for its recommendation is this :

“A Society which is registered under the Industrial and Provident Societies Act is an incorporated body, and it is clear from judgments of the Courts . . . that an incorporated body is a legal entity apart from its members.

“We are . . . faced with the fact that a separate legal entity — the Society — is interposed between the income . . . and the members, and in our opinion the existence of that entity cannot, as we have already stated, be ignored, any more than the existence of an entity separate from the shareholders in the case of an incorporated company. Income Tax at the full rate has to be paid on the undistributed profits of a company irrespective of the individual liabilities of the shareholders, and there must be many companies in which a considerable body of the shareholders are not individually liable at that rate.”²

This argument is not original to the Raeburn Committee : the Committee of 1905 and the Royal

¹ Figures supplied by courtesy of Co-operative Union Ltd., Manchester.

² *Report of the (Raeburn) Committee appointed to enquire into the Present Position of Co-operative Societies in relation to Income Tax, 1933, pp. 8-9.*

Commission of 1920 had used it : but the Raeburn Committee places more emphasis on it and gives more weight to this argument in arriving at its final conclusions than do the others. Of the view given by the Committee we would express some criticisms :

(i) If a company of which a number of the shareholders are poor, places money to reserve, these reserves are taxed at standard rate. A portion of the reserve is to be imputed to the poor shareholders. To tax their money at standard rate is to inflict an injustice on the poorer shareholders ; and to alter the system of co-operative taxation so as to make it approximate in nature to that of the other " poor " companies, is not to increase, but to diminish, the amount of justice in the present tax system.

(ii) The real thing involved, the Raeburn Committee states in this emphatic fashion, is the corporation — it is a " separate legal entity ". To look at the " separate legal entity " in this way, without consideration of the personal and social facts lying behind it, is to run the danger of abandoning reason. It is often affirmed, and rightly affirmed, by jurists, that " the purpose of the law is to introduce order and justice into social relations ". An argument which holds that some corporations are treated in a certain way, and that therefore all corporations ought to be so treated, is not likely to lead to much advancement in the state of the law. The human and social facts covered by the word " corporation " are in each case so very different : they have little more than the name in common. What is the common nature of a joint-stock company, a trade union, a university and a public charity ? Certain characteristics they all have in common. But it is not necessarily the case

that a legal rule appropriate to the trade union will fitly apply to the joint-stock company and the university as well. To act on the assumption that it must, would make a chaos of the law. Yet this is what the principal argument of the Raeburn Committee amounts to.

And (iii) in a reservation, signed by seven members, made to the *Report* of the Royal Commission on the Income Tax of 1920, it was pointed out that :

“ If there were in the United Kingdom, as there is in the United States of America, a corporation tax levied specially on corporations as such, it would, no doubt, be proper that a co-operative society should, as a separate legal entity, be made liable to that tax. But the Income Tax is not a corporation tax. It is a tax upon the incomes or profits of individuals, and though for convenience it is assessed in the first instance upon corporations in which they hold interests, the amount of it is always adjusted to the income not of the corporation, but of the individual shareholders.”¹

Indeed, to argue, as does the Raeburn Committee, that a co-operative society is a corporation, and therefore ought to be taxed in the same way as a joint-stock company, is to misconceive the entire nature of the British Income Tax.

10. The situation in regard to the taxation of co-operative societies as it existed before 1933, has been shown in the table which we gave earlier. About this situation the Royal Commission of 1920 had said :

“ There is a curious anomaly in this position. . . . It is . . . that if a Co-operative Society invests its surplus funds in War Loan, for example, the resultant

¹ *Report*, p. 164.

income is exempted from tax, but if it invests those funds in acquiring property the society is liable to pay tax either on the basis of the rents received, or on the annual value of the premises if they are occupied by the society.

“ . . . there appears to be no sound reason for differentiating between reserves invested in stocks and shares and reserves invested in property, and we recommend that the income derived from invested reserves should, irrespective of the particular mode of investment, be subject to tax.

“ We recommend, in effect, that a society should be treated exactly as a limited liability company trading in similar circumstances and under similar conditions.”¹

Our earlier discussion is sufficient to show that the attitude of the Commission represents a giving up of the effort to proportion the Income Tax to the income of the people concerned. The incomes of co-operators were already being sufficiently taxed, and perhaps a little overtaxed, in the burdens they bore under schedules A and B.

If, for the sake of symmetry, the income derived by the societies from stocks and shares is to be taxed, as well as that derived from land and property (which is already taxed under schedules A and B), then all of these sources of income ought to be made taxable at a rate less than the standard rate, and the aggregate payment should not exceed that already made under schedules A and B. Taxation of the societies' reserves we have shown to be sheer over-taxation.

¹ *Report*, pp. 119 and 121. (Part of the passage in the *Report* is italicised.)

APPENDIX

1. PUBLIC works in a depression and the Income Tax.

The theory which we developed in Part III had reference only to the case of a stationary or continuously progressive community. In the real world, as everybody knows, progress in a community is not along a smooth curve, but takes place by fits of intensive economic activity followed by periods of industrial slackness and of severe unemployment, particularly in the investment goods industries. Which policy, both monetary and fiscal, could most appropriately be pursued by a Government in order to alleviate the distress of unemployment and poverty during depressions, and also to prevent the political damage which they may cause, is one of the major problems confronting economists at the present day; and a large amount of research is, very properly, being directed to this question.

The present author has nothing that is new to say on this topic; but he should like to denote his adherence to the manner of thinking of Keynes, Harrod, Mrs. Hicks and others. These writers advocate, as measures to combat the manifold evils of a period of trade depression, a system of consumers' subsidies such as payments of unemployment benefit or dole, partly financed by borrowing; and, a much more important instrument on which to rely, a policy of public works. This would create primary as well as secondary employment, whereas the dole payments would only create secondary employment, since the original payment of the money distributed in dole is not in return for any work done. Again, public works give the community a concrete return for the money which it is spending.

The financing of the works should be carried out by Ways and Means advances, Treasury bills and stock of longer dated maturities, in such a proportion as to fortify, so far as possible, the liquidity of the country's banking system and enable it to combat the deflationary tendencies of the depression.

A case has also been made out, which to many must seem entirely convincing, for the establishment of a Government Office for the Planning of Public Works, whose function it would be to determine which public works could most appropriately be postponed from periods of good trade to periods in which the volume of employment was declining.¹

Responsibility for redeeming the loans raised during the depression to finance the schemes of public works and consumers' subsidies, would probably fall mainly on the income taxes. This redemption could be carried out by maintaining the Income Tax and Sur-Tax at a sufficiently high and unchanged level throughout the course of the trade cycle, so that the budget surpluses of good years would make up for the deficits of the bad. Or, perhaps, during a depression, if investment prospects were believed to be improving and the schedule of the marginal efficiency of capital to be fairly elastic, the height of these income taxes might, with advantage, be lowered, with a view to leaving the rich with larger money balances and encouraging the recovery of investment.

But, as Harrod has pointed out,² the chief requisite in the next depression must be to provide the public works out of borrowing, even though the loans so raised may never be more than partially repaid.

2. If an income tax is progressive, a person whose income fluctuates pays a higher rate of taxation than that corresponding to his average size of income.³

Let us suppose that a certain individual's average income is $\text{£}x$ per year, but that in some years his income is greater than $\text{£}x$, in others less. The successive amounts by which his income falls short of its average, $\text{£}x$, are, let us say, $\text{£}a_1, \text{£}a_2, \dots$; and the successive amounts by which it exceeds its average, $\text{£}\beta_1, \text{£}\beta_2, \dots$

¹ Harrod, *The Trade Cycle*, pp. 196-201; and Ursula K. Hicks, *op. cit.* pp. 229-30.

² *Op. cit.* pp. 215-23.

³ See Ahman, "Uncertainty-bearing and the Income Tax", *Economic Journal*, 1929.

Since \bar{x} is the average income, therefore $\Sigma\alpha = \Sigma\beta$.

We consider first the case represented in diagram I in which the income tax is proportional, being imposed at a flat rate of, say, 10 per cent :

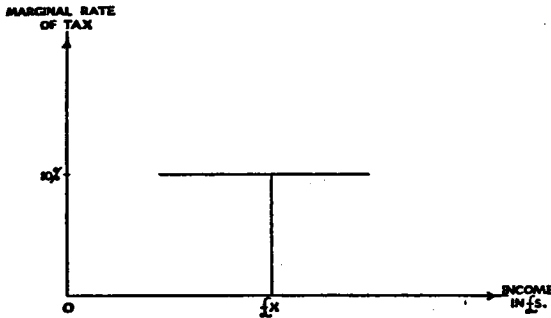


DIAGRAM I

In the years when the person's income falls below \bar{x} he will pay an amount of income tax less than he would have done had his income remained at a steady level of \bar{x} . The total amount of taxation which he escapes in such years is $\Sigma\alpha \cdot 10/100$, £'s. On the other hand in the years when his income exceeds its average figure, he will pay to the Exchequer more than he would have done had his income been steady. The amount extra which he pays in such years will be in all $\Sigma\beta \cdot 10/100$, £'s. But $\Sigma\alpha = \Sigma\beta$. Hence it will be just as if on the average the person paid income tax on an income of \bar{x} . (We disregard the influence of time discount, which would not seem to be important here.)

If the income tax is progressive in amount, being higher on each additional increment of income which is earned, then the curve of marginal rate of the tax will be upward-sloping, as in diagram II. Let the rate of tax which corresponds to the person's average size of income be R , which is equal to $P M$ in diagram II. When his income falls below its average size, \bar{x} , he will escape payment of income tax on the amount by which it is deficient. If we adopt the same terminology in regard to the meanings of α 's and β 's as before, then the

310 THE INCIDENCE OF INCOME TAXES

total amount of tax payment which the person will avoid making in these years when his income falls below its average, will be a payment on a total amount $\Sigma\alpha$, £'s of income. The

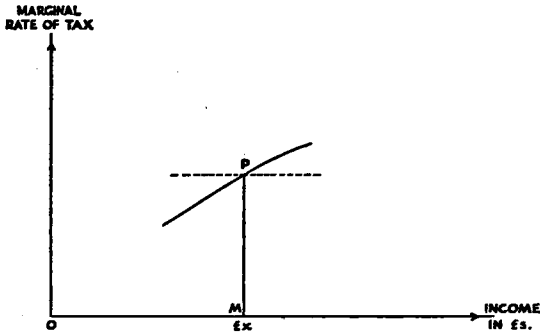


DIAGRAM II

rate of tax payable on each unit of this income is at a rate less than R . The total tax payment that the person avoids, therefore, will be less than $R\Sigma\alpha$, £'s.

In the years in which his income exceeds its average

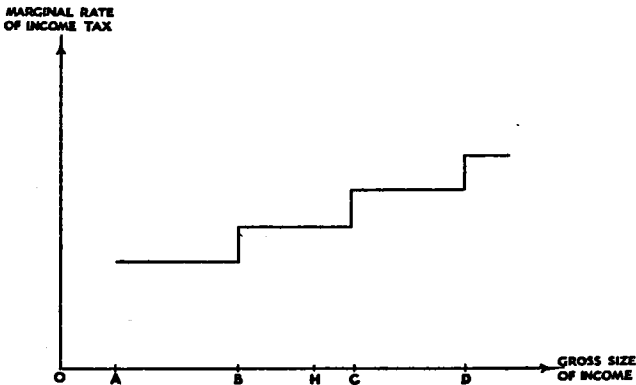


DIAGRAM III

amount, he will make a tax payment on an additional amount of income equal in all to $\Sigma\beta$. The rate at which tax is paid on every unit of such amount is greater than R . His total

tax payment on such amount of income, therefore, is greater than $R\Sigma\beta$, £'s.

Hence the amount of tax payment which the person makes in these years when his income exceeds its average size is greater than the amount of tax payment which he escapes in the years when his income falls below its average size. That is, under a progressive income tax, a person whose income fluctuates, pays income tax at a higher average rate than he would have done had his income been of constant size.

The British Income Tax (including Sur-Tax) is graduated in steps, somewhat after the fashion of diagram III. Clearly if a person's income which is of average size OH, fluctuates sufficiently to take it, in some years, into the range CD, above that within which his average size of income lies, then his average tax payment will be greater than that for an income which is equal to OH in size and which is constant from one year to another.¹

3. The severity of a progressive income tax increases when a rise occurs in the general price level.²

Let us suppose that a rise occurs in the price level of a certain community; and consider the case of an individual whose income increases by the same percentage as the price level, both increasing, say, by 15 per cent. The scale of income tax, we suppose, is progressive, as represented in diagram IV. If the individual's money income increases from OA to OB, which is 15 per cent higher, then it can be seen from the diagram that the total proportion of his income which he pays in tax is greater than before.³ His gross real income is the same as before, but his net real income is less. This effect is accentuated, the more strongly progressive is the marginal rate of tax to which he is liable.

¹ "Under the scale for 1925-26 an income of £4000 and £10,000 in two successive years pays £138 more in tax than an income for each year of £7000" (*Colwyn Report*, § 349).

² See Viner, "Taxation and Changes in Price Levels", *Journal of Political Economy*, 1923; and Kambe, "Prices and Injustice in Taxation", *Kyoto University Economic Review*, 1927.

³ If T (I) is the total income tax payable by a person whose income

312 THE INCIDENCE OF INCOME TAXES

It follows that a person whose money income increases, but by less than the rise in the general price level, will suffer both on account of the rise in prices which reduces his gross real income and the higher rate of income tax to which he becomes subject, which operates to further reduce his net

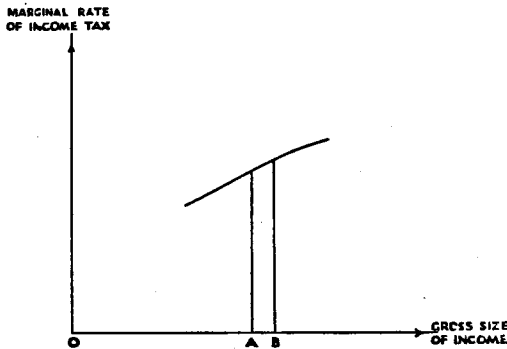


DIAGRAM IV

real income. Or, again, in order that a person who is subject to income tax at an increasing marginal rate should enjoy a higher real income when the price level rises, it will be necessary that the increase in his money income should exceed to some extent, the rise in the price level.

4. Examples of calculation of liability to British Income Tax (illustrating the rules given in Chapter XVIII, § 6).

The following are based on the rates of tax in force for the Income Tax year 1937-38, ending April 5, 1938 :

is I, then when his income rises, he pays a higher percentage of it in taxation

$$\text{if } \frac{d\left(\frac{T}{I}\right)}{dI} > 0$$

i.e. $\text{if } \frac{dT}{dI} > \frac{T}{I} \quad \dots \quad (1)$

And it can be shown geometrically that a sufficient condition for this is that dT/dI should be monotonic and > 0 .

(1) Single man. Income £250, wholly "earned":

Gross income . . .	£250	
Earned income re- lief (1/5) . . .	£50	
Personal allowance	100	
		150
Liability (on "taxable income") . . .	£100	@ 1s. 8d. in £ = <u>£8 6 8</u>

(2) Married man. Income £500, wholly "unearned":

Gross income . . .	£500	
Personal allowance	£100	
Wife's allowance . . .	80	
		180
"Taxable income" . . .	£320	
Liability at reduced rate	£135	@ 1s. 8d. in £ = £11 5 0
„ standard rate	£185	@ 5s. in £ = 46 5 0
		<u>£57 10 0</u>

(3) Married man with two children. Income £1700 "earned" plus £200 "unearned":

Gross earned income . . .	£1700	
Earned income relief (maximum) . . .	300	
		£1400
Unearned income . . .	200	
		£1600
Personal allowance	£100	
Wife's allowance . . .	80	
Child allowances (2)	120	
		300
"Taxable income" . . .	£1300	
Liability at reduced rate	£135	@ 1s. 8d. in £ = £11 5 0
„ standard rate	£1165	@ 5s. in £ = 291 5 0
		<u>£302 10 0</u>

It may be mentioned that further reliefs, additional to those mentioned in the text, are allowable, in respect of

dependent relative (allowance £25) and — to widows and widowers only — *housekeeper* (allowance £50). Reliefs are also allowed for life-assurance premiums paid on policies on the life of the taxpayer or his wife.

A further measure of relief is allowed to persons of sixty-five years of age or more whose incomes do not exceed £500 per year, inasmuch as all their income is assessed in the same way as “earned income”, even although part or the whole of it may be “unearned”:

INDEX OF NAMES

- Ahman, S., 308 n.
 Allen, R. G. D., 147
 Amoroso, L., 47 n.
 Anderson, A., 29
 Asquith, H. H., 244
- Balogh, T., 237 n., 240 n.
 Barone, E., vii, 143-4, 231-2
 Bastable, C. F., 124, 138
 Benham, F., 233 n., 278 n.
 Besant, Annie, 173
 Board of Inland Revenue, 38,
 298-300
 Bowley, A. L., 147 n.
 Bradlaugh, C., 173
 Busschau, W. J., 82 n., 92 n.,
 101-4, 113
- Cabiati, A., 5 n.
 Calandra, A., 187 n.
 Cannan, E., 122-3, 232
 Carr-Saunders, A. M., 290 n., 292
 Chamberlain, N., 285, 302
 Charles, Enid, 238-9
 Coase, R. H., vii, 54 n., 219 n.
 Coates, W. H., 3, 19 f., 36, 141
 Colm, G., 211 n.
 Colwyn Committee, 3, 30 f., 42,
 120-21, 141, 222, 247-9, 311 n.
 Co-operative Union Ltd., 303 n.
 Crowther, G., 237 n., 240 n.
- Davenport, H. J., 13 n., 28
 Dawson, W. H., 86 n.
 de Kock, M. H., 54 n.
 De Viti de Marco, A., vii, 39 f.,
 142, 144, 188 f., 277, 278, 281
 Departmental Committee on
 Income Tax (1905), 292
 Douglas, P., 165, 170-71
- Eastham, J. K., vii
 Edgeworth, F. Y., 32, 124-5, 137,
 228-30
 Einaudi, L., vii, 19 n., 27, 41, 79-
 80, 131 n., 141 n., 142, 144,
 188 f., 256, 277, 278 n.
- Fagan, E. D., 136 n.
 Falk, O. T., 237 n., 240 n.
 Fasiani, M., vii, 65 n., 78 n.,
 278 n.
 Fay, C. R., 292
 Fisher, I., 256-7, 269-70, 277-8
 Florence, P. S., 290 n., 292
 Frisch, R., 158 n., 165 n.
 Fubini, R., 5 n.
- Glass, D. V., 179 n.
 Guillebaud, C. W., 271-2, 280-81
- Hall, N. F., 237 n., 240 n.
 Harrod, R. F., 235 n., 307-8
 Henderson, H. D., 237 n., 240 n.
 Hicks, J. R., 45 n., 147, 216 n.
 Hicks, Ursula K., 249 n., 307-8
 Himes, N. E., 173
 Hobbes, T., 227
 Hobson, J. A., 138-9
 Hough, J. A., 290 n.
- Jeppe, C. W. B., 85 n., 86 n.
- Kambe, M., 311 n.
 Kendrick, M. S., 136 n.
 Keynes, J. M., 27, 213-15, 264,
 307
 Knight, F. H., 157-9, 191
 Kotze, R., 84
- Landsberg, E., 60 n., 89

- Lange, O., 213 n.
 Lausanne, 125-6, 130
 Lawn, J. C., 82 n.
 Layton, W., 7-8, 13 n.
 Leake, P. D., 20
 Lehfeldt, R. A., 89 n.
 Lehmann, F., 211 n.
- Macfie, A. L., vii
 MacGregor, D. H., 269 n., 281-4,
 292
 Marshall, A., 12-14, 26-8, 32, 124-
 125, 128-9, 137-8, 227
 Martin, J., 87 n.
 McLintock, W., 293
 Meade, J. E., 223
 Mill, J. S., 269, 277-8, 282-4
 Morgenstern, O., 262-4
- Nisbet, J. W., vii
- Peers, R., 290 n., 292
 Pigou, A. C., 165 n., 167 n., 182 n.,
 235 n., 256-7, 270-71, 275, 277-8,
 282, 292
 Plant, A., 54 n.
 Pugliese, M., 155 n.
- Raeburn Committee, 285, 288,
 303-5
 Reddaway, W. B., 224 n.
- Rees, J. M., vii
 Ricardo, D., 76 n.
 Ricci, U., 126, 272, 273 n., 279-81,
 282-3
 Robbins, L., 13 n., 27-8, 179 n.,
 223, 262-4, 280
 Robertson, D. H., 3, 5 n., 13 n.,
 19 n., 27-8
 Robinson, Joan, 181 n.
 Royal Commission on Income
 Tax (1920), 292, 303, 305-6
- Schultz, H., 67
 Scott, W. R., vii
 Seligman, E. R. A., 3, 6-7, 13 n.,
 36, 119-20, 141, 229 n., 245
 Sensini, G., 126
 Shove, G. F., 13 n., 28 n.
 Silverman, H. A., 121-2
 Simoas, H. C., 233 n.
 Smith, A., 78
 Spaulding, H. B., 245 n.
 Sraffa, P., 13 n., 90 n., 153 n.
 Stamp, J., 139-41, 222-3, 292-3
 Stevenson, T. H. C., 174
- Viner, J., 311 n.
- Wicksell, K., 137, 141-2
 Wright, H., 178
- Yule, G. U., 173 n.

THE END

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