Work, Welfare and Taxation

A Study of Labour Supply Incentives in the UK

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Preface

The contents of this book form part of a research programme that I have been directing at the City University Business School since 1981. The programme is concerned with the Economics of the Welfare State and in this volume we focus our attention upon the way in which the tax system and the system of welfare benefits affect labour supply incentives. In another volume, *Insurance for Unemployment*, Valerie Brasse and I consider how unemployment insurance might be funded as insurance proper, that is, on the same basis as property insurance or funded pensions. Other publications in the series have related to pensions.

The various chapters in the book have been authored as indicated but it will become apparent that this is not an edited collection of papers concerned with a similar theme. Instead each chapter is related and forms part of a common research plan which I have devised. In this respect I assume general responsibility for the overall contents but not the details, and specific responsibility for the chapters with which I am directly associated.

In Chapter 1 I set out the mechanics of household budget lines which describe the relationship between hours worked and net disposable income after all taxes and welfare benefits have been taken into consideration. These budget lines or constraints embody the set of labour supply incentives because rational individuals are likely to trade off the amount of work they do against net disposable income in deciding how much to work or whether they want to work at all.

I argue that in addition to its traditional application to short-term labour supply decisions the budget line concept may be extended to dynamic labour supply decisions, for example, the amount of labour supplied over a tax year, or the amount supplied over the life cycle. The latter produces a theoretical basis for analysing retirement decisions which forms an integral part of the labour supply decision.

Chapter 1 sets the scene for the remaining chapters. In Chapter 2 Don Egginton illustrates how the tax-benefit system

influences household budget lines for a broad category of households. While his analysis refers to 1983 his results are symptomatic and typical of present arrangements. He begins by considering single people and then goes on to consider the budget lines of married people and single parent families. By changing assumptions about wage rates, housing costs, tenure type and the number of children he illustrates the complex interactions between the tax system and the broad range of welfare benefits that currently exist. This is a lengthy and at times heavy-going chapter which reflects the intricacy of the subject matter and the complexity of the system.

Whereas Chapter 2 examines the system in depth as it existed in the early 1980s, in Chapter 3 Don Egginton takes a broader historical view on how budget lines have evolved during the postwar period. He also includes data on replacement ratios dating back to 1920. This longitudinal study is designed to place the contemporary analysis, which forms our primary material, into historical perspective.

Chapter 4 is our first empirical exercise, in which Don Egginton examines the 1978 and 1981 Family Expenditure Surveys to see if labour supply incentives at the household level actually influence labour supply decisions. We wish to thank the ESRC Archive at the University of Essex for providing us with the FES tapes and the Department of Employment for granting permission to use them. Both in respect of hours worked and in respect of whether or not to work at all there seemed to be no obvious support for the thesis that labour supply incentives, as we have measured them, influence household labour supply decisions.

In Chapter 5 Alan Dalziel and I, using the same data but applying econometric techniques, examined the issue in greater detail. Using linear probability and logit analyses we could only find weak support for the thesis that the unemployed are influenced by labour supply disincentives. Accordingly our results are consistent with other microeconometric investigations of labour supply in the UK which suggest that unemployment is not greatly influenced by the tax-benefit system.

The labour supply incentives facing pensioners in the UK are investigated by Peter Warburton in Chapter 6. There are two aspects to this. First, when should one retire? Secondly, how much

work, if any, should one wish to do during retirement? Answers to these questions are not independent. This chapter describes static and dynamic budget lines facing pensioners.

For the most part the book is descriptive rather than prescriptive. We seek to describe labour supply incentives as they exist as well as their effects without putting forward, here, any proposals of our own for reforming the tax-benefit system. However, in Chapter 7 Michael Parker and I explain the budget line implications and associated labour supply incentives of the new social security system advocated by the government in June 1985. Our approach parallels that in Chapter 2. We consider various cases to illustrate the workings of the new system which we compare and contrast with the present system.

Finally, in Chapter 8 I bring together the material as a whole.

The research programme as a whole has been funded by the Institute for Economic Affairs. My colleagues and I would particularly like to thank Lord Harris and Arthur Seldon for their support in this venture.

Michael Beenstock
January 1986

Contents

1

Budget Lines and Labour Supply Incentives

Michael Beenstock

I
Introduction

Main Objectives

The 1980s have witnessed a renewed interest in the economics of social security and work incentives. In the UK, for example, policy recommendations have been coming thick and fast and the government in 1984 launched a series of major reviews of social security arrangements culminating in its Green Paper published in June 1985. Not since Beveridge's time has the issue attracted so much attention. Within weeks of each other separate proposals for reform have been proposed by Atkinson (1984), Dilnot, Kay and Morris (1984) and Minford (1984). These have been usefully reviewed by Parker (1984).

In this book we try to step back from the frontiers of the policy debate with two major objectives in mind. First, we seek to help the uninitiated understand what the whole problem is about in the first place. To achieve this we show in detail how various taxes and benefits affect work incentives in the UK. In doing so, we focus on the concept of the ***budget line*** which shows the relationship between net income and effort. The concept of the budget line is introduced in most texts on employment. However, this is usually done in a simplified way. At the other end of the

spectrum proponents of reform have calculated complex budget lines which are often difficult to understand. What seems to be missing is a text which explains how complex budget lines are constructed from their elementary counterparts. We believe that such a text will be useful to economists, social administrators and policy makers.

We therefore try to identify the effects of divers taxes and social security benefits upon budget lines. In this chapter we set out the various building blocks for constructing budget lines and we hope that by the time we finish the reader will be familiar with the ways in which the taxes and benefits listed in Table 1.1 affect budget lines and thus work incentives.

While our first objective is essentially pedagogic and descriptive our second main objective is more analytical and difficult. The premisses of most reformists are that

(1) the interplay of taxes and benefits has eroded work incentives in the UK, and
(2) these disincentives have reduced the amount of effort supplied by the UK workforce.

If (1) were true but (2) were false attitudes to reform might be different. It is therefore important to ask whether the budget lines and work incentives facing individual families actually affect work decisions. Macroeconomic evidence adduced, for example, by Minford *et al.* (1983), suggests that the tax-benefit system has indeed adversely affected labour supply in the UK. However, this is contested, for example, by Layard and Nickell (1985). Our concern is therefore to look at the microeconomic evidence – that is, at the level of the individual or family rather than across

Table 1.1 Types of Taxes and Benefits

Taxes	*Social security benefits*
Tax thresholds	Supplementary Benefit
Standard rate of tax	Unemployment Benefit
National Insurance contributions	Child Benefit
	Housing Benefit
	Rate Relief
	Family Income Supplement
	Pensions

the economy as a whole. So our second objective is to see if the tax-benefit system actually influences the amount of effort supplied by individuals.

The Chapters Ahead

As stated, the remainder of this chapter sets out the conceptual building blocks that are used in constructing realistic budget lines. An added complication arises in the case of people who are contemplating retirement: should they carry on working or should they retire now? We therefore consider the building blocks for this case too.

In Chapter 2 we apply the concepts set out in Chapter 1 and construct budget lines for various family types. For a given tax-benefit system we show how budget lines are sensitive to wage rates, housing costs, number of children, and so on. Thus, incentives may vary independently of the tax-benefit system. Numerous family cases are examined and we hope that the diversity of choice will give the reader some idea of how incentives vary across families. This exercise is carried out in terms of the tax-benefit system as of 1983.

In Chapter 3 we consider how budget lines have evolved since the early 1960s. The object of this exercise is to see how changes in taxes and benefits over time have jointly influenced work incentives. Ideally, we wanted to extend the analysis further back in time but this was impossible to do comprehensively because the necessary information could not be accurately assembled. Indeed, even for the recent past such as the 1960s it is difficult to infer how Housing Benefits were administered. To avoid the proliferation of cases our historical analysis is illustrated with respect to a married couple with 2 children.

In Chapter 4 we begin the empirical analysis related to our second main objective. From Chapter 2 we already know which family types face greater work disincentives. Is it the case therefore that these families are more work-shy? Our data source is the 1978 Family Expenditure Survey (FES) which provides the necessary information for constructing household budget lines and also reports the work status of the individuals in the approximately 7,000 households surveyed. We look at the distributions of unemployment and hours worked for different

household types in order to ascertain the answer to the work-shy question. This overview of the data does not suggest any obvious affirmative answers, that is, it is not self-evident that disincentives induce work-shy behaviour.

In Chapter 5 we attempt to answer the same question but with more refined statistical techniques. We develop a methodology for parameterizing budget lines and for each family we test various hypotheses of labour supply dependence upon budget lines. Here too, the results do not support the work-shy hypothesis either with respect to the 1978 FES or the 1981 FES.

Do these negative results imply that labour market incentives do not matter? We do not think this is the appropriate conclusion primarily because our data base did not appear as reliable as we had hoped. There were too many inconsistencies in the data for comfort. For example, there were unemployed individuals who were reportedly consuming well enough but who were not receiving any income whatsoever! Were they in the 'black economy' or were they holding back information? We shall never know. In many other cases too, it was difficult to understand how people were making ends meet. Thus, our negative results may simply reflect data deficiencies.

This is a pity because affirmative results could have been used to help design a more efficient tax-benefit system. Had we successfully estimated a model of household labour supply we could have used it to liberate people from the ravages of the poverty trap. Proposals for dealing with the poverty trap usually turn out to be very expensive to the Exchequer. Alternatively, if the reforms are to be revenue neutral they usually imply either low zero income support levels or high marginal tax rates for people on relatively low incomes, see, for example, Barr (1975). However, these proposals usually make no allowance for the very disincentive effects that they are designed to remedy and ignore the beneficial effects to the Exchequer that would be implied if people were liberated from poverty. For example, if it were the case that the 3.2 million or so unemployed were only in this state because of the poverty trap, the abolition of the poverty trap would turn 3.2 million people into contributors to the Exchequer from public expenditure burdens. These dynamic benefits are what reform is all about yet they are usually assumed to be zero. This is like assuming there is no problem in the first place.

Whereas the study as a whole is concerned with incentives to work, in Chapter 6 we digress slightly by considering retirement incentives. Retirement decisions and labour supply decisions have much in common and so we think our digression is relevant. We examine the effects of the basic state pension scheme in which the individual is rewarded for postponing retirement to between the ages of 65 and 70. We also consider occupational pension arrangements based on final salary principles. In both cases the individual has to calculate the costs and benefits of postponing retirement and we try to expose the trade-offs implied by such decisions.

In Chapter 7 we consider the proposed reforms of the UK social security system that were published in the Green Paper in June 1985. To some degree these reforms fundamentally change the nature of the social security system and we thought it might be useful to indicate how budget lines and labour supply incentives are likely to be affected. We also compare and contrast the proposed system with the existing system.

Finally, in Chapter 8, the main findings of our research are brought together and conclusions recorded.

II
Budget Line Theory

The Basic Model

The simplest of budget lines is illustrated in Fig. 1.1, where the vertical axis measures income and the horizontal axis measures leisure time. If the individual does no work at all he devotes all his time to leisure which on Fig. 1.1 is represented by the distance *OA*. If the unit of time is a day then *OA* equals 24 hours. If instead he only devotes *OQ* of the day (or time period) to leisure he must be devoting *QA* of the day to work.

In Fig. 1.1 we assume that the individual only gains income through work and that he pays no taxes and receives no state benefits. If he devotes all his time to leisure his income must be zero. Thus, at *A* income is zero. If he spends *AQ* of his time at work his income is equal to *OY*, and if he spends all his time at work (*AO*) his income will be *OB*. The schedule *AB* tells us the

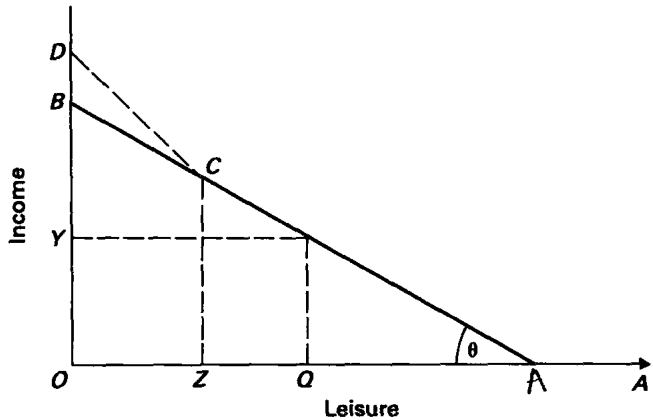

Fig. 1.1 The budget line

relationship between effort and income faced by the individual and is henceforth referred to as the ***budget line.***

The slope of the budget line (θ) reflects the individual's wage rate. People on higher rates of pay will have steeper budget lines (i.e. θ will be larger) because their income must be higher for a given amount of time spent at work. If wage rates are constant the budget line must be linear as in the case of *AB*. If instead the individual begins to earn overtime rates after, say, he has worked for *AZ* of time the budget line will no longer be linear and will be kinked at *C*. In this case the budget line will be *ACD*, that is, the marginal return to effort supplied increases after *C*.

Taxation

Let us return to the linear budget line in Fig. 1.1 and consider what happens when we allow for the existence of direct taxation. We must take account of both tax allowances and marginal rates of tax. The government allows us to earn a certain amount (*OS* on Fig. 1.2) without paying any tax at all. This tax allowance depends upon marital status. Thus, along the *AT* segment of *AB* no taxes are paid and gross and net income after tax are the same. If the individual spends more than *AQ* of his time at work his income will exceed the tax allowance and his taxable income is defined as his actual income minus his allowances. The taxable income is

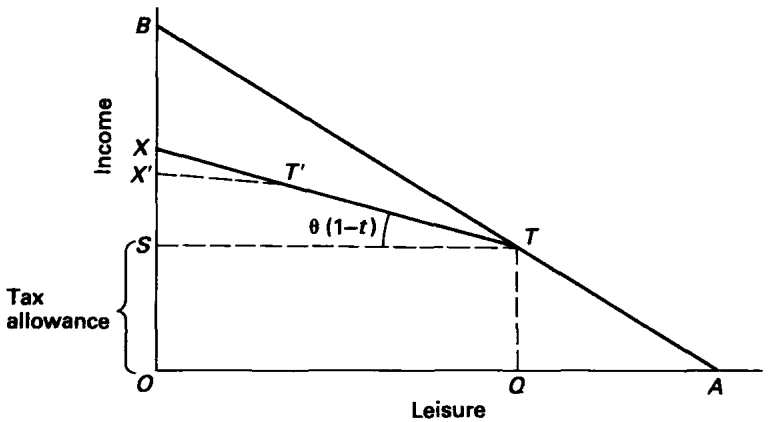

Fig. 1.2 Taxation and the budget line

taxed at the marginal rate of tax (t). For example, if the rate of income tax is 30% the individual retains 70p of every extra pound earned above his allowances and gives the balance of 30p to the Inland Revenue.

This implies that the budget line beyond T is no longer represented by TB since this refers to gross income whereas the individual is concerned with his net income. In fact, the budget line over this range becomes TX since the vertical distance between TB and TX is paid in tax. For example, if the individual spends all his time at work his gross income is OB, he pays XB in direct taxes, so his net income is OX. Therefore, $XB/SB = t$.

As long as the tax rate does not vary with income the segment TX will be linear and its slope will be equal to $(1-t)$. Therefore, if the tax rate is higher TX will be flatter because for a given extra amount of effort the individual's net income rises more slowly. On this basis, his total budget line is represented by ATX rather than AB, the kink at T reflecting the point where tax allowances are used up. For people on higher rates of pay this kink will be further to the right since AB is steeper. The opposite will apply for people on lower rates of pay.

In practice, tax rates are not constant. Richer people face higher tax rates because the tax system is progressive. For example, on Fig. 1.2 we assume that at T' the marginal rate of tax is raised. Since more marginal income is now lost in taxes the

budget line becomes flatter after T' and is represented by $T'X'$ rather than TX. In this case the overall budget line becomes $ATT'X'$ since this now describes the relationship between net or disposable income and work time. Thus, as the tax bracket changes further kinks in the budget line are induced.

Supplementary and Unemployment Benefits

Next we consider what happens to the budget line ATX when Supplementary Benefit (SB) or Unemployment Benefit (UB) is provided by the authorities. Since the basic principles involved are the same with respect to SB and UB we consider the former case only.

If a person is in receipt of no income at all he and his family receive SB. The level of SB depends on marital status, number of children and housing costs. It also depends upon whether the claimant has been receiving SB for more than a year and whether he is not seeking employment. In the latter case the scale rates are higher according to long-term SB rates. On Fig. 1.3 the level of SB is represented by AH, that is, if the individual does no work at all and receives no income he is provided with AH of benefits. Notice that the level of SB is assumed to be higher than the tax allowance

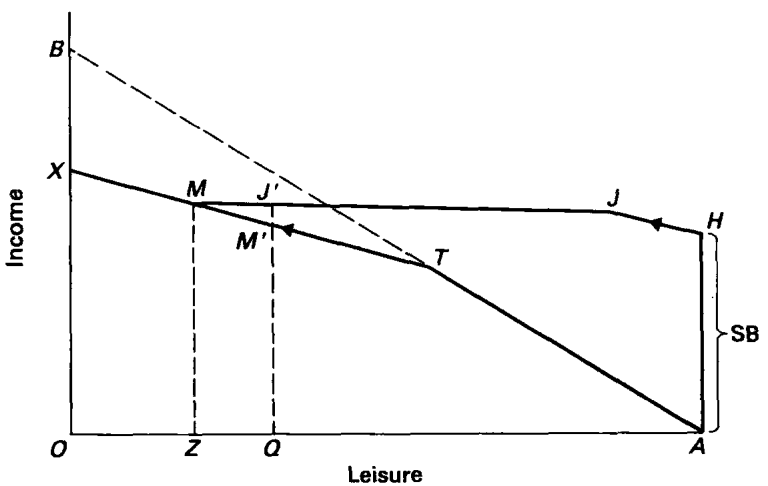

Fig. 1.3 Supplementary Benefit and the budget line

as is fairly typical. However, taxation does not matter here because SB is related to after-tax income. This is because the principle of SB is to provide a basic living standard irrespective of tax deductions, costs of getting to work, and so on. The individual is also allowed to earn a certain small amount (the disregard) without forgoing any SB. On Fig. 1.3 this is represented by the segment *HJ*. Since the disregard is calculated after tax and since Fig. 1.3 assumes that SB exceeds the tax allowance the slope of *HJ* must equal $(1-t)$, that is, *HJ* and *TX* are parallel. If instead *AH* were less than the tax allowance the slope of *HJ* would be the same as the slope of *AT*.

Once the disregards are used up SB is reduced penny for penny with *net* income. This implies that at the given rates of pay that have been assumed the individual can spend more time at work without increasing his net income. Thus, if he spends *AZ* of his time at work his net income is *ZM* which is equal to the SB level plus the disregard. So if he works more than *AZ* he no longer receives SB. Therefore, the next segment of his budget line is *JM* which is perfectly flat. Once he is no longer in receipt of SB his budget line reverts to what is left of *ATX*, that is, *MX*. In this way his overall budget line has become *AHJMX* from *ATX*.

The reader may check that the length of *JM* rises with the level of SB and the rate of tax but falls with the level of tax allowances and the wage rate. As we shall see, *JM* is a major adverse factor in labour supply incentives.

SB cannot be claimed by people in full-time work, which is defined as exceeding 29 hours per week. Therefore, the discussion so far has assumed that *AZ* is less than 29 hours a week. What happens if instead *AQ* is 29 hours per week? In this case only *JJ'* of *JM* is applicable since SB can only be received up to *AQ* of work time. Thereafter, the only source of income is what he earns himself after tax which is represented by *MX*. Thus, he makes himself worse off by working any amount of time between *Q* and *Z*. Taking these factors into consideration his budget line assumes the rather grotesque form of *AHJJ'M'X*. This situation is more likely to occur with families which have high SB entitlements and low rates of pay.

Family Income Supplement (FIS)

FIS is designed to support families *with children* where the head of household works more than 29 hours per week. Therefore FIS takes over where SB leaves off. If the family has no children then Fig. 1.3 applies. In this section we consider how FIS affects the budget line in Fig. 1.3.

Whereas SB is calculated on a net income basis, FIS is calculated on a gross income basis, although Housing Benefit (see below) is netted out. The level of FIS depends on the number of children and claimants receive half the difference between the prescribed income levels and their gross incomes. For example, if the prescribed income level is £90 per week and the claimant's gross income is £70 per week, the weekly FIS payment will be £10. This amount tends to zero as gross income rises to £90 per week. The effects of this are illustrated on Fig. 1.4 where *AHJJ'M'X* and *ATB* replicate their counterparts in Fig. 1.3. The prescribed income level according to FIS is represented by *OK*.

If the individual works more than *AN* his gross income will be greater than *OK* and he will not be entitled to FIS. If he only works *AQ* his gross income is *QF* which is less than the prescribed income and so his FIS entitlement is 0.5 $(OK - QF) = FD$. The shaded area represents the FIS benefit received; it is at a maximum at *AQ* and it goes to zero as *AN* of time is worked. On this basis

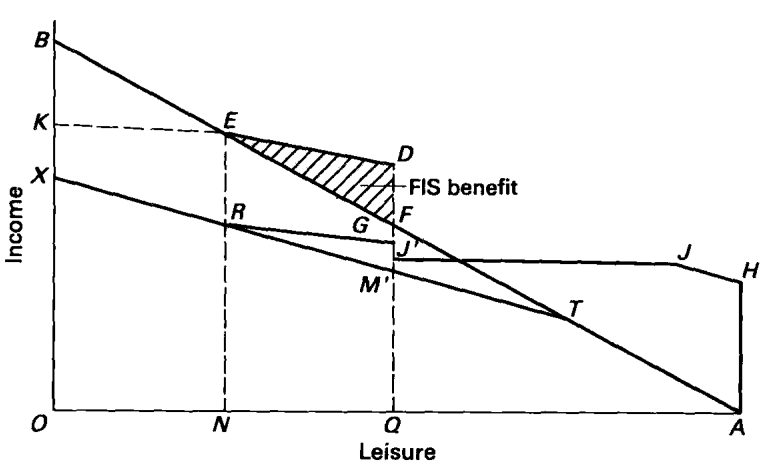

Fig. 1.4 Family Income Supplement and the budget line