

## Tax Theory and Targeting: A Survey

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# **TAX THEORY AND TARGETING A SURVEY**

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by Bruce Bradbury

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Tony Eardley  
Editor

## **Abstract**

In many countries, the targeting of income transfer schemes leads to a very high effective marginal tax rate on private income. How can the equity goals associated with targeting be made consistent with the maintenance of labour supply incentives? This paper reviews the inevitable trade-offs facing income-tested tax-transfer systems, and then goes on to examine the conclusions of a growing body of economic analysis of these questions. This analysis, growing out of the literature on 'optimal income taxation' seeks to provide a framework for a balancing of the conflicting efficiency and equity issues involved in income-based redistribution.

Though existing research is not able to provide firm guidelines to policy, there are valuable insights - particularly from research that has begun to incorporate the administrative features of programs. These have major implications for the structure of income testing. Insofar as activity testing increases labour supply, one might argue for the use of a higher benefit withdrawal rate - since this permits a lower tax rate at other points in the distribution without defeating equity objectives. At the same time, economic theory has yet to seriously analyse the diversity of social goals in this area. Different social evaluations of the value of 'leisure' may have important implications for policy.

I do not doubt that some expert in modern economics would find it helpful to say that targeting should be pushed exactly to the point at which the marginal benefit from it exactly equals its marginal cost. Anyone who is enlightened by that wonderful formula fully deserves that enlightenment. (Sen, 1995: 22)

# 1 Introduction

In many countries, income transfer schemes for the working-age poor involve very high effective marginal tax rates on private income. In many cases, additional income from private sources reduces income transfers on a one to one basis and in almost all other cases this ‘tax rate’ is over 70 per cent for substantial income ranges.

The disincentive effects of these tax rates are widely recognised, particularly in countries such as Australia and New Zealand (and to a lesser extent the other English-speaking countries), where income testing is a central feature in the targeting of social transfer payments. Even in other countries where greater shares of payments are paid via social insurance, income-testing arrangements are often important in the associated supplementary schemes of social assistance. An international trend towards greater targeting of transfers to the most needy is likely to make these issues of wider concern.

How can targeting be made consistent with the maintenance of labour supply incentives? And, indeed, is targeting based on income desirable? There are no easy answers to these questions. If poverty alleviation (or income inequality reduction) is a central goal of social security systems, then current income levels are bound to be an important part of the mechanism for targeting assistance to the most needy. This is not to deny the potential for social (or private) insurance mechanisms to bear much of the burden of intra-life cycle redistribution. But inevitably, many will fall through the gaps in such systems (particularly those with low lifetime incomes) and income testing will be an important mechanism for identifying these individuals. The appropriate structure for income-tested, or social assistance, programs for people of working age is the main focus of this paper. However, many of the issues considered here also have parallels in social insurance programs.<sup>1</sup>

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1 Unemployment insurance is one program that provides substantial transfers to the poor often without explicit tests on current incomes. Such programs also face trade-offs which have strong parallels to those discussed in this paper. That is, increases in benefits must be accompanied by higher ‘taxes’ (insurance contributions). These taxes can either be levied on high- or low-income workers, leading to closely related targeting issues.

The key features of the trade-off facing policy makers can be simply summarised. It is desired to provide a base grant to people without any resources. The grant is smaller for people with higher levels of private income. The grant is financed by income taxes (or their equivalent) on the whole population, with a specified structure of marginal tax rates. Income transfer recipients may or may not be also paying taxes. The combination of the withdrawal rate of benefit plus the marginal tax rate (if relevant) is sometimes termed the effective marginal tax rate (EMTR). This paper (for the most part) follows the economics literature and simply refers to this as the marginal tax rate, describing the combined impact of the transfer and tax systems.

In the simplest structure considered here there are three parameters: the level of base grant, the marginal tax on the poor (a combination of the benefit withdrawal rate and any income tax rate applicable), and the marginal tax rate on those with higher incomes. Poverty alleviation will be greater the higher the base grant, but efficiency considerations favour a decrease in both the marginal tax rates. But it is impossible to move one of these parameters in a preferred direction without moving one of the others unfavourably.

For example, the base rate of benefit can be kept high and income tax rates low, if the rate of benefit withdrawal is high. But this then provides little incentive for the poor to increase their income - creating a 'poverty trap'. Alternately, the base rate can be held constant and benefit withdrawal rates reduced. This, however, means that more people will be subject to the marginal tax associated with benefit withdrawal, and income tax rates will need to be raised to finance the additional payment. In the limit, benefit withdrawal rates can be reduced to zero by making payments universal. But this must be financed by increases in other taxes (most of which are incident upon labour), and hence labour supply disincentives for those paying taxes (who may include many of those receiving positive net benefits).

These trade-offs remain a prominent feature of the social policy debate in countries like Australia and New Zealand where income-based targeting is widespread. In Australia, a reduction in withdrawal rates was an important aspect of the recent reform of income testing of unemployment and related income support payments in 1994 (Saunders, 1995). Whilst a

central goal of this reform was to make it worthwhile for those receiving unemployment benefits to make efforts to increase their incomes, the constraints outlined above meant that, in the end, the extent of reform was quite limited, with high marginal tax rates remaining for most unemployed people. One response to these issues has been to propose more radical reforms to the structure of income testing via the use of instruments such as guaranteed minimum incomes or negative income taxes (NITs). These were proposed by the Commission of Inquiry into Poverty (1975) in the 1970s, and more recently by Dawkins (1996).

The greater recent interest in these alternative structures in Australia and many other countries has been fuelled by three main factors. The first is the long-term persistence of high levels of unemployment, even in periods of peak cyclical economic activity (Bradbury, 1993b). This suggests that part of the explanation for continuing high unemployment may be found in micro-economic factors influencing labour supply and demand. The second is the steady widening of the male wage distribution in Australia and other countries and the potential negative implications for labour market incentives. The third, and perhaps the most important, is the increasing diversity of working time arrangements to be found in the labour market. No longer are incentive questions confined simply to the relative attractiveness of full-time employment and full-time benefit receipt. Not only are recipients more likely to find employment which will only supplement rather than replace benefit income, but also policy makers may wish to encourage this behaviour so that recipients maintain their contact with the labour market.

The difference between real world administrative processes and those associated with a negative income tax are discussed further in Section 5. In terms of their relationship to income, however, NITs are simply particular forms of the general model outlined above. A 'pure' negative income tax, for example, can be described as a universal base grant combined with a uniform (or possibly variable rate) income tax used to finance it. A guaranteed minimum income is usually defined as a particular variant of this, with 100 per cent marginal tax rates for those receiving net transfers - thus ensuring that all are brought up to the level of the base grant, but with minimal expenditure.

Even though these types of framework are extremely limited and do not take into account other features of actual tax-transfer systems, assessing the best trade-offs between equity and efficiency goals is very difficult. To do this requires an analytical framework that permits one to evaluate explicitly these trade-offs. For this, we turn to the economic literature on ‘optimal income taxation’.

What insights does this literature have to offer for policy in this area? Is there a case for any of the many alternatives that have been suggested? Indeed, does the divergence of policy practice from theoretical results have insights to feed back into the further development of theory in this area? These are the main questions to be addressed in this paper.

The paper has the following structure. In Section 2, the patterns of effective marginal tax rates found in a number of OECD countries are briefly summarised. Many countries, particularly those where social insurance plays a major role for people of working age, have very high withdrawal rates. Where social assistance is of more importance, particularly in the English-speaking countries, marginal rates tend to be lower - though still generally quite high. The Earned Income Tax Credit in the USA is an exception, with negative effective marginal tax rates over some income ranges. In Australia, policy reforms over the last decade have generally reduced marginal tax rates. However, this has meant that relatively high marginal tax rates now affect a greater proportion of families.

The most systematic attempt to address the conflicting goal of these income-targeting questions is to be found in the literature on optimal labour income taxes, initiated by Mirrlees (1971). Section 3 reviews this literature, outlining the key assumptions and conclusions of the theoretical models developed in this literature. Derived as it is from welfare economics, this literature assumes a social goal of maximising a function of the utility levels of individuals in the population. Implicitly, this values both the incomes and the leisure (or the disutility of work) of individuals.

In Section 4 two alternatives are considered. One is the poverty minimisation approach, whereby the social goal is to increase individuals’ incomes without regard for the amount of work they



undertake. This approach places no value on the leisure of the poor, and a number of studies have evaluated the importance of this assumption for the optimal structure of marginal tax rates. A second alternative, which also appears in the policy debate, but not in the economic literature, is to place a negative value on the leisure of the poor (or idleness).

For the most part, the optimal tax literature does not deal with the administrative aspects of income transfer schemes to the poor. And yet, in policy terms, these are often considered more important than the income-testing arrangements. Section 5 considers the implications of different administrative arrangements for the optimal income-testing structure of benefits. It is concluded that, depending upon the concept of social welfare employed, arrangements such as work tests and other active labour market policies may provide grounds for the use of higher marginal tax rates for beneficiaries.

The key conclusions are summarised in Section 6. Two types of conclusion are drawn. The first are the lessons that economic theory has for income-testing structures. As Sen's ironic statement above implies, economic theory provides no easy path to enlightenment in this area. Nonetheless, normative economic theory and positive applied research have much to contribute in this area, particularly in the way they have clarified the key issues that need to be addressed in formulating policy.

The second set of conclusions relates to further economic research. Whilst economic models in this area must inevitably be highly stylised and incomplete models of reality, there are many real world aspects that deserve further study. In addition to greater consideration of the administrative features of income transfer schemes, there is a need for research which provides a greater integration of this supply-side analysis with the institutional structures on the demand side of the labour market - particularly minimum wages and involuntary unemployment.

## **2 Effective Marginal Taxes for Income Support Recipients**

Whilst all welfare states have income transfer systems designed to assist needy families of working age, income is not the only indicator used to

qualify for receipt. In social insurance programs, previous contributions are the key eligibility criteria and entitlements are of limited duration. Typically, these schemes also employ categorical targeting mechanisms that indirectly introduce a redistributive element. Thus labour force and health status are key indicators for unemployment and disability programs respectively.

Whilst social assistance schemes are more closely focused on the alleviation of poverty, they also employ a range of non-income-based targeting mechanisms. Targeting assistance on the basis of age, health/disability status, demonstrated labour force status (e.g. job search / education), location, family composition and wealth is widespread and often the defining feature of particular programs. We return to consider some of the policy implications of these different targeting mechanisms in Section 5.

However, to the extent to which poverty alleviation is a key goal of social assistance programs, then income (and to some extent wealth), is a key variable used to identify recipients and to allocate income transfers to them.

In many countries, social assistance schemes have effective income tests of 100 per cent. The goal of providing a minimum income is central, and any supplementary income reduces benefits by the same amount. In their survey of social assistance schemes in OECD countries, Eardley and his colleagues (1996) show this extreme income testing to be prevalent in countries with a wide range of welfare systems. Countries as diverse as Austria, Denmark, Finland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and Turkey all generally had very high effective withdrawal rates of benefit in the face of additional incomes. (The schemes also tend to have substantial local discretion.)

This diversity, however, needs to be considered in the light of the residual role of social assistance. In the Nordic countries in particular, social assistance was intended very much as a secondary form of income support backing up comprehensive social insurance payments (though this is coming under increasing stress). In addition, and this is a point to which we return in Section 5, these social assistance schemes generally incorporate very interventionist work testing and job placement

mechanisms. In the poorer countries in the above list, on the other hand, perceived budget constraints may also be important, with tight targeting the only perceived means of providing assistance to the most disadvantaged.

In many other countries, however, social assistance is becoming increasingly important, and concern for work incentives has led to attempts to design programs with effective tax rates of less than 100 per cent on additional income. These attempts have also been motivated by changes on the demand side of the labour market, with a large proportion of employment growth occurring in part-time work. If part-time work is to be a viable transition mechanism to fuller employment, incentives must be made to encourage further increases in work effort. Nonetheless, effective marginal tax rates generally remain high.

Thimann (1995), for example, reviews the German social income assistance system. He finds that, over a wide range of incomes, recipients face high tax rates of close to 75 per cent (taking account of both social assistance payments and taxes). However, it is in the English-speaking countries where social assistance type schemes are both most important, and where greatest attention has been devoted to minimising undesired incentive effects of high benefit withdrawal rates.

In the US, a major initiative in the last decade has been the introduction and expansion of the Earned Income Tax Credit (EITC). This program provides a subsidy to those low-income families receiving Aid to Families with Dependent Children (AFDC). Around 80 per cent of these families are sole parent families (mainly sole mothers). The EITC provides a tax credit, which can be taken as a cash benefit if tax liability is insufficient. It is structured so that the payment increases as earnings increase up to a certain threshold, and then decrease thereafter. Over the range where the benefit increases, it therefore creates a negative marginal tax rate.

The overall impact of the tax needs to be assessed as part of the whole package of benefits available to eligible families. Walden (1996) reviews the outcomes of this package for welfare recipients resident in North Carolina, in both 1993 and 1996 (the EITC was expanded significantly between these two years). He focuses on the situation of a sole parent

with two children. In addition to income from AFDC, earnings and the EITC, his base calculation takes account of the value of food stamps, social security tax and federal and state income taxes. He also considers alternative definitions of disposable income including medical assistance, housing assistance and the costs of working and child care.

Using the narrow definition of disposable income, families did experience negative marginal taxes over a small range of incomes in 1996 (around \$US8000 pa). Including the non-cash benefits removes this effect, but nonetheless the EITC does significantly increase incomes for those with a small level of earnings, and reduces marginal taxes over the phase-in range.

The expansion of the EITC during the 1994 to 1996 period also had a clear impact. Disposable incomes increased for those with earnings up to around \$US26 000. Marginal tax rates fell for those with earnings of up to \$US10 000 and increased for those with higher incomes because of the phasing out of the benefit. In 1996, using the cash income definition, marginal tax rates were under 30 per cent for incomes up to \$US10 000, rising to over 60 per cent between \$US14 000 and 18 000, and between 50 and 30 per cent for higher incomes. More comprehensive income definitions accentuated this inverted U-shaped pattern. In particular, the withdrawal of Medicaid at an income of \$US14 000 leads to a sudden loss of around one-fifth of household income at this point (unless the person finds a job including health insurance).

The advantages and disadvantages of the EITC are well known. On the one hand, it provides an incentive for welfare recipients to increase their incomes up towards the poverty line (the US official poverty line was around \$US13 000 for a family of three in 1996). This corresponds to full-time employment with a wage a little above the minimum wage, though only about five per cent of US workers receive minimum wages (OECD, 1998). Correspondingly, however, the expansion of the EITC has increased the marginal tax rate on people with incomes just above the poverty line, with potential negative incentive effects.

Whilst the income test reforms in recent years in Australia have not led to negative marginal tax rates for any income ranges, there have been several reforms aimed at removing high marginal tax rates. Recent

changes have included the further expansion of the supplementary family payments paid to low-income families with children and the 1987 and 1995 reforms to income testing. The latter led to a reduction of the maximum benefit withdrawal rate from 100 to 70 per cent and a partial individualisation of benefit income testing (see Bradbury, 1993a; Whitlock, 1994; Saunders, 1995; and Ingles, 1997).

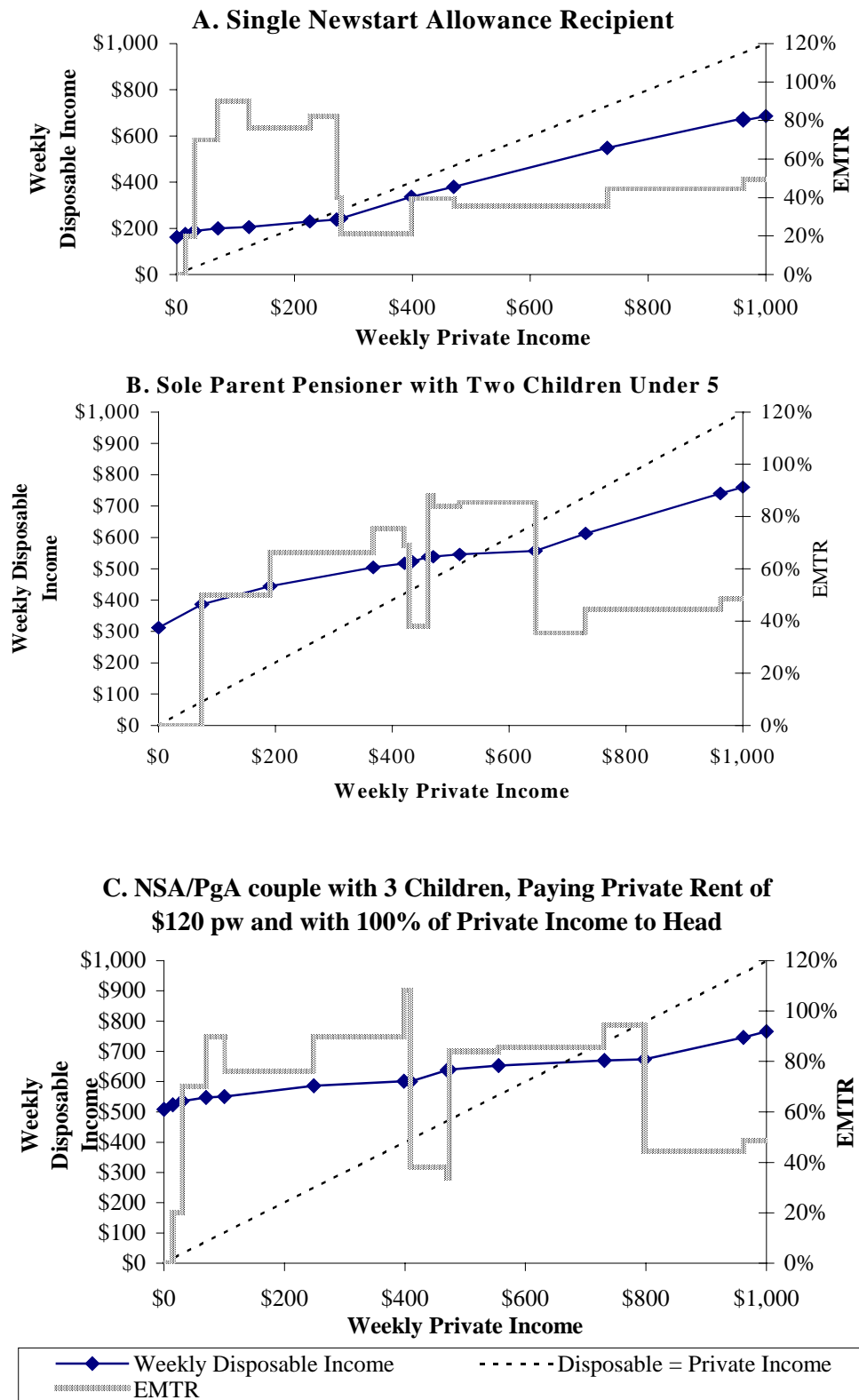
Individualisation means that when one member of a couple has earnings, their payments are reduced rather than those of their spouse. Once the earning partner's benefit is reduced to zero, further earnings reduce the income of their spouse. Whilst this change, of itself, did not alter family returns from additional work, it did lead to greater equity of income distribution within the household.

On the other hand, to the extent to which family members only care about their own incomes, individualisation of income testing generally implies a higher marginal tax rate. This is because an increase in own-wage income reduces own-benefit income according to the marginal rate, whilst under a non-individualised system the reduction in own benefit is only half this. However, whilst personal incomes may have some behavioural impact, we assume here substantial income sharing within the household, and focus on outcomes for family living standards.

The three panels of Figure 1 show the structure of marginal tax rates for three groups of income transfer recipients in Australia as at July 1998.<sup>2</sup>

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2 Other papers describing aspects of the marginal tax rate structure facing low-income Australian families include Dollery and Fletcher (1997), Polette (1995), Cashel and McGavin (1992).

**Figure 1: Australian Tax/Transfer Schedules as at 1 July 1998**

In each panel, the solid line shows the relationship between private income (more specifically, earnings) and disposable income (using the left-hand axis). Where this line lies above the line of equality of gross and net incomes (shown dotted) the family is a net recipient of transfers. The slope of the disposable income line is equal to one minus the effective marginal tax rate, and the latter is also indicated on the diagrams (in grey and using the right-hand axis). These figures incorporate the income-related features of both the social security system and the income tax system. Because the latter (and also some features of social security payments) are calculated on the basis of annual incomes, it is necessary to assume an even distribution of income across the year.

The intersection of the disposable income line with the left-hand axis shows the base grant received when there is no private income. Comparing the three panels, it is clear that the higher this base grant, the wider the range of incomes for which high marginal tax rates apply. This is because the additional social transfers to families with dependants are relatively small at higher income levels.

For large families receiving rent assistance (Panel C), high marginal tax rates apply for a very wide range of incomes - up to almost \$800 per week. As a point of comparison, median full-time weekly earnings at this time were around \$630 and \$550 per week for men and women respectively. Only six per cent of men and seven per cent of women working full time had wages of less than around \$330 per week, and the modal income range was around \$500 per week for both.<sup>3,4</sup>

As a result of reforms to the unemployment benefit system, however, the marginal tax rate is almost always below 100 per cent - though of course

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3 Derived from Australian Bureau of Statistics (1997), *Weekly Earnings of Employees, Australia, August 1997 (Cat. No. 6310.0), Main Features* [from <http://www.abs.gov.au>] and assuming an approximate wage growth of four per cent per annum.

4 The calculation in Panel C assumes that all the private income is earned by the head. If private income was more equally spread between husband and wife, the marginal tax rate faced by the family as a whole is generally slightly lower (except between \$400-\$500). This stems from the more favourable tax treatment of dual-earner couples in the tax system.

reducing marginal tax rates has increased the range of incomes over which they apply.

Finally, it is interesting to note that in all cases, high marginal tax rates continue into income ranges where the family is paying more taxes than they receive benefits. This range is substantial for large families with children, as family payments deliberately extend into income levels of low- and moderate-income earners. An important motivation for the expansion of these family payments was to make low-paid work more attractive in comparison to unemployment. Whilst they did succeed in doing this, the reduction of marginal tax rates at one point in the system has undesirable consequences elsewhere. As Ingles notes with respect to the 1987 policy changes:

Ironically the main effect of the ‘poverty traps reduction package’ implemented in 1987 was not to remove such traps but rather to shift them out to other income zones. (Ingles, 1997: 23)

Oliver (1997) illustrates the impact of this on employment incentives.

... families on median weekly earnings (around \$32,000 a year) may often be only a little better off, and even occasionally worse off, than similar families on \$20,000 a year. (Oliver, 1997: 11)

Thus reforms to one aspect of the tax/transfer system inevitably lead to potential problems at other income levels. Intuition leads to contradictory conclusions. On the one hand, low marginal tax rates are desirable. On the other, we want these tax rates to affect as few people as possible. But if taxes on the well off are to be used to provide benefits to the disadvantaged, marginal taxes must occur somewhere. Where should high marginal tax rates lie?

### **3 The Optimal Labour Income Tax Model**

Since optimisation under constraint is the bread and butter of economic analysis, it is not surprising that there is sizeable economic literature dealing with these and closely related issues. The seminal article is the



paper by Mirrlees (1971). The question he and others have considered can be summarised as ‘what tax/transfer structure is optimal given the information constraints under which governments must act’. The theory is thus an explicitly normative one, seeking to provide (broad) policy guidelines on the basis of normative assumptions and empirical information about behavioural responses. There is no attempt to explain the origin of real-world tax systems, nor the positive issues of political economy involved in transformations of the tax system.

By necessity, the ‘optimal income tax’ models of Mirrlees and others are very simple, encompassing only those aspects that are necessary to make the question sensible. The concept of ‘best’ is described by a social welfare function which can take account of the well-being of all members of society, but which can also be structured to reflect a greater concern with the living standards of the most disadvantaged. Individuals differ in their potential wage rates, and can make their own decision as to how much paid work to do. Governments are assumed to be able to observe wage incomes, but not the potential wage rates of individuals, and can levy taxes and provide cash benefits based on these observed incomes. As well as transferring income between individuals, these taxes must also raise revenue for other purposes. The basic model takes no account of family or household structure and only considers a single time period.

Whilst it is not the intention here to delve into the algebraic form of the optimal tax models, it is important to have understanding of the types of assumptions used. The most important ones for our purposes are as follows.<sup>5</sup>

- Individuals have preferences over income and the quantity of labour they supply. These preferences are summarised by a utility function with associated labour supply function.
- Though individuals have identical preferences, they differ in their skills, summarised by a potential wage rate (e.g. an hourly wage rate), which is not observed by the revenue raising authority. The

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5 See Heady (1993), Tuomala (1990), Kanbur (1987) and Quigley and Smolensky (1994) for introductions to the literature.

model assumes a particular distribution of these skills across the population (usually a lognormal distribution). The total income of individuals (wage rate times working hours) is observable, and can be subject to tax.

- The labour supply choices implied by the theory are often described in terms of hours worked in a given period. However, in principle, the concept of labour supply is much broader, encompassing work effort and all other decisions that might lead to higher incomes (such as education decisions).
- The welfare of individuals depends both upon their wage income (net of taxes) and their leisure time. Leisure time in this context includes all non-paid (and hence not taxable) time such as home production. Labour supply choice is a function of both the skill level of individuals and the tax/transfer system. It is usually assumed that the identical preferences are such that income increases with the wage rate. This implies that rankings of individuals based on wage rates, incomes and welfare are identical.
- It is assumed that the wage rates for each skill level do not depend upon their labour supply (i.e. elasticity of substitution between individuals of different skill groups is infinite). This means that income taxes are incident upon the people who pay them rather than employers (or other employees indirectly via employers).
- The objective is to maximise a social welfare function defined as a weighted sum of the welfare of all individuals. This welfare function is usually represented as having a single parameter, which represents the relative weight given to the most disadvantaged. Social preferences thus range from giving equal weight to all individuals to only being concerned with the welfare of the most disadvantaged person.
- There is also an exogenous revenue requirement (for public goods etc.).
- The policy instrument available is a tax schedule, which can include payments to individuals. In the simplest models, the schedule is assumed to be linear, comprising a base grant and a

single tax rate. Our focus here, however, is on more general models  
 - since the shape of the tax schedule is the key feature of interest.

In this simple structure, there are thus four sets of assumptions which determine the conclusions as to the optimal form of the tax/benefit structure: the magnitude of the behavioural response (and whether this might be different for different income groups); the social welfare function; the distribution of ability; the government revenue requirement; the production structure (i.e. whether taxes affect pre-tax wages); and the revenue requirement. The relevant literature to date has focused on the first three of these, and this focus is continued here.

Whilst numerical simulations are generally required to produce quantitatively useful results, there are three qualitative results which are generally found.

- The marginal tax rate should everywhere be non-negative.
- The marginal tax rate for the highest income individual should tend to zero.
- It will generally be optimal to have at least some people choosing not to work.

The first of these might seem unremarkable. However, it does stand in contrast to the EITC in the US, which as was noted in Section 2, has a negative marginal tax over part of its range. A negative marginal tax means that earnings are actually subsidised by the state, with people on higher earnings receiving greater payments.

The second result is perhaps the most striking: the top marginal tax rate should be declining and tend to zero for the highest income individual. This is the case even if the social welfare function is ‘Rawlsian’,<sup>6</sup> that is, only concerned with the welfare of the poorest individual. Whilst not directly relevant to the questions considered here, this example is interesting in the way it illustrates the logic of the optimal tax model.

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6 See Atkinson and Stiglitz (1980), for a discussion of economic welfare functions.

With a Rawlsian social welfare function there is no social concern for the living standard of the individuals with the highest skills. Nonetheless, we wish to raise as much tax revenue from them as possible in order to provide benefits to the most disadvantaged. Let us assume that on the last unit of income the highest income person pays a finite marginal tax. The hours that this person works have been chosen on the basis of the existence of this tax. If the tax on the next unit of income after the current maximum were sufficiently lower, however, the person would work slightly more - paying more tax in total. Hence, to maximise revenue, taxes should be set for each dollar so that the person just finds it worthwhile to work. This implies a tax structure with a declining marginal rate which reaches zero at the income where the person would not wish to work more even in the absence of taxes.

Note that it is the marginal rate on the final unit of income of the highest income person that should approach zero, not the marginal rate on all their income. Also, it is important to understand that this reasoning only works because there are no people with higher incomes. If there were, the drop in marginal tax rates would reduce their average tax rate, leading to a fall in tax revenue.

This result is not particularly informative for policy. Simulations using the model suggest that even the top 0.1 per cent of earners is a very poor approximation to the income of the last earner (e.g. Tuomala, 1990). However, it does have important heuristic value as it reminds us that the relationship between tax structure and equity goals is not at all simple. Even those primarily concerned with maximising transfers to the poor need to be aware of the potential implications of different tax structures for labour supply of both the poor and the rich (who provide the revenue for distribution).

The third result above is the most relevant to the design of social assistance policy. Most models imply that it will be optimal to have some people who do not work. This is because their productivity (wage rate) is insufficient to compensate for the lost leisure that working would entail. This result, more than any other, brings out the distinctiveness of the welfare economic approach to the question of targeting.

From a traditional social policy perspective, this conclusion may seem paradoxical. How can it be socially optimal to have a tax/transfer system that encourages idleness? However, empirical studies of labour supply suggest that individuals do indeed value leisure (or more precisely, time spent in activities other than paid work). It is therefore natural that the individualist ethic of welfare economics should lead to leisure being included as part of the ‘social good’. However, there are alternative ethical frameworks, including a concern with low income per se, ethical views of the value of work, and expressions of desert. These alternative approaches, and their implications for the optimal tax/benefit structure are considered further in Section 4.

Apart from these three results, which are relatively insensitive to the particular explicit forms chosen for social welfare and labour supply functions, general results which do not depend upon specific assumptions are scarce. Nonetheless, a body of research using simulations based on a range of different assumptions has now accumulated, and these results are reviewed later in this section.

First, however, it is useful to review some of the intuition between the results. One of the most important features of the optimal tax structure is the way it has led to (a degree of) conceptual clarity about the key assumptions and empirical facts relevant to tax/transfer design. Before moving on to consider some of the results from the literature, we therefore review a number of the key principles established in the literature.

### **Principles of Tax/Benefit Structure**

An elementary but key distinction in tax theory is that between average and marginal tax rates. The average tax rate is tax expressed as a proportion of pre-tax income. Tax here includes benefits (as a negative tax). For people receiving more transfers than they pay in taxes, the average tax rate is negative. The marginal tax rate is the additional tax paid on each additional unit of income (including withdrawal of benefits). In most tax schemes, the marginal tax rate is positive for both taxpayers and benefit recipients, though as we have seen in the case of the EITC, it can be negative for some income ranges.

Whilst the concept of ‘tax progressivity’ is often described as a tax system that involves increasing marginal tax rates, the consensus among

economists is now to define progressivity in terms of an increasing average tax rate. If the average tax rate is increasing with income, then after-tax income will be more equally distributed than pre-tax income.<sup>7</sup> This means, for example, that a tax/transfer system including a positive base benefit that is taxed back at a constant rate will be progressive. Indeed, progressivity can be obtained with a marginal tax rate that falls with income.

Whilst it is the average tax rate that matters for equity, it is the marginal tax rate that matters for efficiency. If taxes did not influence behaviour, it would only be necessary to focus on the pattern of average tax rates in order to arrive at a desired redistributive structure. However, in the presence of behavioural effects, the pattern of marginal tax rates assumes particular importance.

In a closely related fashion, the impact of a change in a tax regime rate can be disaggregated into two effects on behaviour. The first is an income effect. If a person faces a higher average tax rate they will be worse off, and they will adjust their behaviour accordingly. If leisure is a normal good, they will reduce their consumption of leisure and hence work longer (or harder). That is, higher taxes lead to more work effort as people seek to maintain their previous living standard.

The second impact is a substitution effect. If the marginal tax on each additional hour of paid work is increased, work will be less attractive compared to other activities such as leisure or home production. This will encourage a substitution towards leisure and away from paid work. The impact of the increase in tax rates will thus have an ambiguous effect upon labour supply. An increase in the marginal rate of taxation for a population group will tend to decrease labour supply because of the substitution effect, but tend to increase it if there is an associated rise in the average tax rate which induces a drop in real incomes.<sup>8</sup>

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7 Assuming there is no re-ranking, which in tax systems based on income alone will be the case if the marginal tax rate is not above 100 per cent.

8 If the tax rate applies across a range of income, and there is no other change, then the marginal and average taxes will move together. However, if the marginal rate is only altered over a small range of incomes then the average tax rate change will be negligible, and the substitution effect will be relatively larger.

When considering the efficiency costs of redistribution, however, it is the substitution effect that is most important. Consider a system that taxes high-income individuals and provides a benefit to low-income people. Both the low- and high-income individuals face income effects, but in opposite directions. The high-income individual loses income, which encourages them to work harder. The low-income individual gains income, which reduces their need to earn income. However, the substitution effects for both high- and low-income earners work in the same direction - discouraging labour supply. This in turn reduces the government's tax revenue, and this loss can be described as the efficiency cost of redistribution.

The optimal tax problem can thus be summarised as one of finding the best trade-off between the desired pattern of average tax rates (redistribution) and minimising marginal tax rates (efficiency).

In addition to value judgements of the amount of redistribution desired, a number of empirical factors enter into this trade-off. One of the most important is labour supply behaviour. The stronger is the substitution effect (the greater the absolute compensated price elasticity), the more important are the efficiency costs of redistribution, and the lower will be the optimal marginal tax rate. In practice, estimating the strength of labour supply responses is very difficult. This is particularly the case here, where the ideal measure would include effort and all other activities likely to increase incomes as well as hours worked.

For this reason, most optimal tax simulations are evaluated for a range of plausible labour supply assumptions, with lower labour supply elasticities implying higher optimal tax rates.<sup>9</sup> Of equal importance, however, is the way in which labour supply responses differ between population groups. One of the few established results in this area is the difference between men and women. It is well established that mothers in particular are more likely to respond to changes in post-tax wage rates than men. As a result of gender stereotypes, they are more likely to have

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9 One weakness in the literature is that this sensitivity-testing is usually only conducted with respect to the compensated price effect. Even though income effects generally cancel each other out, it is conceivable that variations in income effects across different skill groups could have important implications for optimal tax structures.

socially recognised alternative activities outside of the labour market to turn to. Economic theory therefore suggests that overall social costs will be minimised if such groups face lower marginal tax rates. This is one reason individual-based taxation may be better than household-based taxation for married couples (Apps and Rees, 1988, 1997).<sup>10</sup>

Similar arguments also apply to different groups of social security clients. Some have strong attachments to the labour market, and indeed are administratively compelled to seek employment. Others, particularly sole mothers (except perhaps in the US where administrative employment requirements are strong), and perhaps the disabled, are likely to have higher labour supply elasticities. The principles of economic tax theory would suggest lower marginal tax rates to be optimal for these groups.

The other empirical aspect of the labour market, which is of particular importance for optimal taxation, is the distribution of skills, or income-earning potential across the relevant population. Most simulations in this literature either work with a small number of skill levels (for computational simplicity) or assume a uni-modal distribution of skills (commonly the lognormal distribution). As noted above, these models typically do not model preference variation, and have labour supply functions that imply that individuals with higher skills will have higher incomes.

From these simple models, a number of principles have emerged which are likely to have a general applicability to tax/transfer design issues. The optimal marginal rate at an income level will

- decrease with the proportion of the population at that income level (since this implies more people will be affected by the marginal tax rate);
- increase with the proportion of people who have higher incomes than at this point (because they will face an increase in their average tax rate without higher marginal rates); and

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10 Couple-based taxation means that the lower income earner faces the same marginal tax rate as the higher.



- decrease with the skill level of people at this income level (since a given drop in labour supply reduces revenue more).

Although it is not a trivial exercise to define an appropriate measure of skill, there is some evidence that these three factors together imply a *decline* in marginal tax rates (though not necessarily average tax rates) as income rises (Diamond, 1998). However, offsetting these are the fact that the efficiency cost of taxes increases with the square of the tax rate (which acts to make more uniform tax rates optimal) and the distributional goals of maintaining low average tax rates at the bottom of the distribution.

### **Studies Examining Non-linear Structure**

The simplest tax/benefit structure that is of any interest for distributional studies is the linear tax. In this case the government pays a base benefit to all individuals and then taxes this back at a constant rate.<sup>11</sup> This implies a constant marginal tax rate across the income distribution. It does not exclude redistribution, since the average tax rate increases with income (low-income people receive a positive payment, and high-income individuals pay net taxes). A large fraction of the optimal income tax literature has used this simple model, which assumes away the main questions of interest here. However, a number of studies have addressed more directly the question of the optimal structure of marginal taxes.

Indeed this issue was addressed in Mirrlees' initial study, where he found the optimal non-linear tax system was not very different to the simple linear model (which is partly why much of the literature is restricted to this model). This broad conclusion has been reinforced in a number of other studies, but not all. Sadka, Garfinkel and Moreland (1982) examine a two step tax structure, incorporating a base grant and two marginal tax steps. They find that the marginal tax on the poor is generally higher than the tax rate on the rich, but that the difference is negligible. One might expect this conclusion to be sensitive to assumptions about the different

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11 Simple negative income tax schedules are of this type. See Harding (1997) for a recent discussion in the Australian context. This is also sometimes (confusingly) described as a 'flat' tax, though many commentators use this term to refer to the corresponding tax with no base benefit.

labour supply responsiveness of low- and high-income individuals. However, studies using plausible bounds for this difference have generally not found a large variation in the optimal marginal rates for the rich and the poor.<sup>12</sup> To the extent to which labour supply variations are likely to be more important, this is relevant more to the tax rates facing different demographic groups (particularly mothers).

Reviewing this research Kanbur (1987: 128) concludes that ‘the approach of social welfare maximization does not support a regime of large differentials in marginal tax rates between rich and poor’. Whilst this is true of most studies, there are some which have found higher marginal tax rates for the poor to be optimal (though few have found higher tax rates for the rich optimal). Slemrod, Yitzhaki and Mayshar (1994) find that, with a two-bracket income tax structure, the second marginal tax rate is always lower than the first. However, the difference is reasonably small, with the gap between the two always less than 10 percentage points. Tuomala (1990) also arrives at a falling marginal tax rate structure, and in some simulations the difference is more substantial than implied by the Slemrod, Yitzhaki and Mayshar results.

Diamond (1998) emphasises the importance of the specific pattern of the distribution of skills. He concludes that for people paying positive net taxes<sup>13</sup> it may be optimal to have a falling marginal tax rate in some income ranges. More specifically, if the elasticity of labour supply is constant it may be optimal to have decreasing marginal tax rates for people below the mode of the skill distribution, and possibly for some small distance above it. Whilst this result is not relevant for those people receiving net transfers it may be relevant to the phase out rate of

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12 See the survey by Ingles (1997) also referring to papers by Betson, Greenberg and Kasten (1982), Kesselman and Garfinkel (1978) and Dickert, Houser and Scholz (1995). In one of the few studies to consider the impact of preference variation (people having different preferences for leisure), Tarkiainen and Tuomala (1997) also find only a small difference in marginal tax rates between the bottom and middle of the distribution.

13 More precisely, this applies to people with skill levels above the level at which it would be desirable to transfer resources away from this skill level if it could be done without efficiency costs. It is also important to note the very restricted labour supply definition in Diamond’s model (with zero income elasticity of labour supply).

payments such as the EITC and the Australian family payment. Diamond concludes that ‘a sizable implicit marginal tax rate where benefits are being phased out is consistent with the U-shaped pattern of marginal rates and may well be optimal’ (1998: 93).

## 4 Non-Welfarist Approaches

### Poverty Minimisation as a Social Objective

In the conventional ‘welfarist’ optimal tax model, social welfare is evaluated as a function of the welfare levels of all individuals, which in turn depend upon both income and leisure. In a series of papers, Kanbur, Keen and Tuomala (Kanbur and Keen, 1989; Kanbur, 1997; Kanbur, Keen and Tuomala, 1994, 1995) and also Creedy (1996) have examined the implication of replacing this social objective with the objective of poverty minimisation. Poverty in these studies is typically defined as a function of the poverty gap: the amount of income below the poverty line.<sup>14</sup> Designing policies to minimise poverty differs from social welfare maximisation in two ways.

- Poverty is measured as a function of income, rather than personal welfare. The social objective therefore assigns no value to the consumption of leisure by the poor. (However, labour supply decisions still affect family income and government revenue.)
- Though the welfarist approach permits a greater weight to be attached to the living standards of the disadvantaged, the welfare levels of more advantaged members still generally carry some weight. (The only exception is the Rawlsian extreme, which only considers the welfare of the poorest individual, but not those immediately above). The poverty minimisation objective, on the other hand, involves a tighter focus on the incomes of those near and at the bottom of the income distribution.

This alternative focus is motivated by the conventional policy discourse.

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14 Their poverty measures also place a greater weight on the poverty gaps of the poorest. The poverty head count is not suitable as a social goal as it implies paradoxical results (e.g. taking income from a very poor person and giving it to someone just below the poverty line will decrease the poverty head count).

Even when work incentives are discussed explicitly it is the implications for government revenue and individual incomes that are paramount; little weight is typically given to such disutility as the poor experience from working. (Kanbur, Keen, Tuomala, 1994: 1616)

In terms of the optimal structure of marginal tax rates, this change of objective function has several effects. If we were to ignore incentive effects among the poor, then minimising a poverty gap requires a base grant equal to the poverty line accompanied by a 100 per cent tax rate on income up to the poverty line level, that is, a minimum income guarantee (see also Atkinson, 1995).

When we take account of labour supply effects, the use of a poverty alleviation criteria has other impacts (see Kanbur, Keen and Tuomala, 1994). In one respect, there is a case for lower marginal tax rates on the poor. This will encourage them to increase their earnings, and no social weight is attached to the loss in leisure associated with this (unlike the welfarist approach). This is offset by the fact that, since there is no social benefit from the leisure of the poor, the need for income transfers to them is greater. In order to raise sufficient revenue, it may therefore be necessary to have higher marginal tax rates on many of the poor.

Simulations based on a poverty alleviation model return a number of conclusions (Kanbur, Keen and Tuomala, 1994 and 1995).

- It remains optimal to have some of the poorest individuals idle. In this case, this is because, with very low potential wage rates, strongly negative marginal tax rates would be required to encourage them to work. These in turn would require high marginal tax rates for higher wage workers, with associated economic costs.
- Compared to a welfarist measure which has the same focus on the bottom end of the distribution, but which places value on the leisure of the poor, a poverty alleviation approach tends to lead to somewhat higher marginal tax rates (for the reasons outlined above).

- In simulations with relatively inelastic labour supply, quite high marginal tax rates at the very bottom of the income distribution are suggested (around 90 per cent at the 10th percentile of the wage distribution).
- The overall pattern of marginal tax rates, however, is not all that different from that found in welfarist models. In both cases they find a pattern of marginal tax rates which *fall* with increases in potential wages.
- The marginal tax rate on the poor is greater the lower is the poverty line. This is because a higher poverty line means that more people will be affected by the associated tax rates (Kanbur, Keen and Tuomala, 1995: 105).
- Assigning more importance to the incomes of the poorest of the poor leads to an increase in marginal tax rates.

In general, therefore, it appears that the dominating impact of a switch from a welfarist to poverty alleviation objective is the minimum income guarantee effect. In addition, their results are also consistent with a conclusion that even within the welfarist approach a greater focus on the poor would also have the impact of increasing marginal rates - though Kanbur, Keen and Tuomala do not address this question directly.

### **The Social Valuation of Labour**

A focus on poverty alleviation is only one of many alternatives to the welfarist formulation. Kanbur, Keen and Tuomala (1994 and 1995) motivated their study of the poverty alleviation objective on the basis of a policy discourse that typically does not ascribe any positive value to the leisure of the poor.

However, much policy discourse goes beyond this, and implicitly attaches a *negative* weight to this leisure. Labour is seen as inherently good. In part, this reflects a concern with dynamic issues. The poor may be considered myopic and unable to fully understand that employment, even if not directly worthwhile, will bring greater benefits in the long

term as they gain entry to better jobs.<sup>15</sup> Closely related views are that the poor will lose their 'work ethic' and/or they will become socially excluded if they do not maintain contact with the labour market.

A stronger ethical argument can also be formulated in terms of the outcome of additional effort. As Ingles argues:<sup>16</sup>

It seems ethically insupportable that if a family makes an effort to earn additional income (by, for instance, the wife taking up a part time job), it may not necessarily be benefited thereby. That the family may, through ignorance or through an internalised work ethic, make the effort anyway does not seem a very good defence of the program design that allows this situation to develop. (Ingles, 1997: 2)

Irrespective of the incentives for additional work, most social assistance schemes employ a range of administrative requirements designed to encourage labour force participation. These work tests and other regulatory criteria are often justified on a political basis: that of encouraging the 'legitimacy' of the system. Taxpayers are not prepared to fund transfers unless they see the recipients 'earning' them. Whilst this is essentially a positive analysis, there are normative values underlying these views of legitimacy. In part, it reflects the poverty alleviation goal of redistribution: there is social support for the maintenance of commodity consumption, but not for the choice to not work. These concepts of equity in exchange have echoes in the work of conservative philosophers. In exchange for assistance, it is accepted the poor must provide labour.

In this framework, it is unacceptable that an optimal policy structure should have able-bodied people choosing to be idle. Wages must be made attractive enough, or labour supply patterns altered, so as to ensure that people do work. This would imply either intervention in the labour market (high minimum wages), low (and possibly negative) marginal tax

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15     Though this is perhaps not unreasonable on their part. It is by no means easy to establish this fact empirically.

16     See also Atkinson (1995).

rates on labour income for the poor, and/or alterations in labour supply behaviour via administrative regulations on the receipt of benefits. It is this last issue that we consider now.

## **5 Theory and Practice**

Whilst work incentives are one of the central planks of the optimal income tax literature, a most notable absence is the lack of consideration of policies explicitly designed to encourage the job search effort and employment of people with low incomes. And yet in most countries that provide social assistance, these policies are an increasingly central part of the programs.

The OECD, in its 1997 jobs strategy review, noted that reform of benefit systems to encourage greater effective labour supply was one of the key strategies for reducing unemployment in member nations. In reviewing the employment strategies of member nations they noted that few governments made large changes to the payments associated with unemployment benefit systems. However, over the 1990s, 14 out of 21 OECD countries tightened eligibility rules, work availability requirements or the enforcement of job search behaviour.

Benefit programs in most countries, therefore, comprise much more than just tax/transfer or negative income tax schemes. Boadway, Marceau and Sato (1997) draw the distinction between negative income tax schemes and ‘welfare systems’ as follows:

Negative income taxes are administered by the income tax authorities who rely on self-reporting by taxpayers (or transfer recipients) and on monitoring by random audits using criminal sanctions as a penalty. On the other hand, welfare systems are administered by agencies employing social workers who are responsible for determining which applicant[s] are eligible for which types of benefits. Monitoring usually takes place administratively rather than through the legal system. (Boadway, Marceau and Sato, 1997: 1).

Whilst social assistance schemes are not necessarily administered by social workers (Australia is a prime example), the distinction between administrative and legal enforcement is important. In part, this distinction exists simply because administrative enforcement is cheaper, and it is easier to make administrative enforcement work when recipients are receiving money which can be withheld in the case of non-compliance. There is no simple administrative equivalent to withholding payment in the taxation system.

Administrative enforcement also means a much greater scope for intervention in the lives of recipients and targeting on the basis of non-income based criteria. In OECD countries, the trend over the last decade has been for an increased administrative intervention, in line with attempts to deliberately create a more ‘active society’. This has included increased emphasis on monitoring job search effort, training programs and job placements (or workfare). Economists have only just begun to incorporate these features of real-world social assistance schemes into models of income transfers, but they do turn out to have important implications for the preferred form of marginal tax rates.

Besley and Coate (1992, 1995), examine models that include ‘workfare’, requiring transfer recipients to undertake work in order to receive benefit. The government’s goal is to minimise the cost of ensuring that everyone has an income at least equal to the poverty line. As in the optimal tax literature, they assume that incomes can be observed, but wage rates cannot. Like the studies of Kanbur, Keen and Tuomala, they focus on income rather than utility. They also assume, however, that the government can require some individuals to undertake work in exchange for benefits. In their model, this required work enters the individuals’ utility function in the same way that the disutility of normal work is included.<sup>17</sup> They conclude that if workfare is available as a policy option, then it will be optimal for the government to require the lowest ability individuals to participate, and to tax their income from other work at 100 per cent.

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17 They also consider other models where the wage rate is observable, where workfare is not available, and where the objective is to maintain utility at some minimum level.



The intuition for this follows in part the discussion of targeting in the absence of incentive effects considered earlier. The objective is to minimise the cost of raising everyone to the poverty line. Hence any earnings that raise individuals above the poverty line should be taxed at 100 per cent. Workfare, as formulated by Besley and Coate (1992, 1995), provides the factor that negates the labour supply disincentive effects of this withdrawal rate. Since benefit receipt requires workfare participation, there is an incentive for higher ability individuals to seek private employment (since they can earn higher incomes for the same work time).

At higher private income levels, however, individuals have higher ability levels and so government expenditure is minimised by not requiring workfare participation and taxing income at less than 100 per cent. This frees the individuals for greater participation in the private labour market. In other words, at higher ability levels the higher wages in the market provide sufficient incentive and it is more cost-effective to provide supplementary benefits which are taxed back at a rate which still encourages participation.

The Besley and Coate model suggests that for individuals of low ability, it is more cost-efficient to use workfare rather than low marginal tax rates to ensure that individuals have incentives to search for private sector employment. Workfare changes individual's labour supply behaviour by making benefit receipt less attractive.

The intuition behind this result can be extended to other types of administrative process. To the extent to which administrative processes can increase effective labour supply (e.g. job search requirements), then higher marginal tax rates will be optimal, at least in the poverty minimisation context. In simple terms, if people are searching for work irrespective of whether this would be their preference, then minimum cost poverty alleviation can be obtained by a guaranteed income type scheme which only raises their income to the poverty line (and hence has a marginal tax of 100 per cent). Whilst imperfections in the administrative processes mean that this alone would not justify a 100 per cent tax rate, this argument does provide a general justification for higher tax rates on those recipients facing administrative labour supply requirements.

Would this conclusion of a high marginal tax rate also apply if a welfarist approach were used? It depends on how administrative requirements are implemented and evaluated. If we think of activities like job clubs and personal support as changing individual's preferences for paid work then this might also apply. That is, the administrative process is decreasing their labour supply elasticity with respect to income. It is a standard result in the optimal tax literature that a lower labour supply elasticity implies a higher marginal tax rate.

On the other hand, a more coercive view of active labour market policies would suggest the opposite. That is, if there are high tax rates but individuals undertake employment because the conditions of benefit receipt are so punitive then their welfare is not being enhanced by the scheme. Besley and Coate (1995), for example, find that in their model workfare is never optimal if a welfarist social welfare function is used.

## **6 Conclusions**

We end this review of the normative economic theory of taxation with two sets of summary conclusions. The first set relates to the conclusions of this research to date, and the guidelines that they can provide for policy makers. As Sen's ironic statement at the head of this paper suggests, we should be surprised if the simple stylised models of economic theory were able to illuminate a clear path for practical policy. Rather, the main strengths of the economic literature are to point to the important assumptions and empirical facts that are likely to be important for policy.

At the same time, an examination of the policy implications of this theory also points to key elements of the real-world policy environment that have yet to be satisfactorily incorporated into the optimal tax model.

### **Indications for Policy**

What can economic tax theory suggest about the optimal pattern of marginal tax rates for income support recipients? Whilst no simple answers emerge, the key value of this literature is that it has begun to clearly identify the factors that might be important. These fall into two

broad categories: aspects of the empirical reality of labour supply and skills, and the underlying normative assumptions of the goals of social policy.

With respect to labour supply, it is important to note that in principle it would be natural to expect any optimal policy to be concerned with labour supply in the broadest possible way. As well as measures of hours worked this includes both effort and longer term decisions (such as decisions to invest in training) - indeed any decision which is likely to influence incomes. For the most part, however, it necessary to rely upon cruder indicators such as hours worked. Despite this caveat, some principles do emerge.

In terms of the distribution of skills (or income-earning potential) the optimal marginal tax should be higher the fewer people there are at an income level and the greater the fraction of people with incomes above that income level. As noted in Section 3, this follows from the relationship between marginal and average tax rates, and is one of the factors that lead some optimal tax models to suggest reasonably high marginal tax rates at the bottom of the income distribution. However, distributional goals can offset these effects and, in a world with diversity of labour supply preferences (which is not generally the case in optimal tax models), this effect might be less sharp, as the monotonic link between skills and incomes breaks down.

For the most part, however, the implications of different labour supply patterns seem to be generally accepted. When the substitution effect associated with labour supply is smaller, then higher marginal taxes and more redistribution will be optimal. The most important implication of this for transfer policy design is likely to be the implications for different demographic groups and the interaction with administrative measures. It suggests that for groups such as mothers (particularly sole mothers) and possibly the disabled, marginal tax rates should be lower.

In addition, it points to the implications of administrative features of programs for benefit design. If features such as job search requirements change the labour supply of individuals, then tax theory suggests that a higher marginal rate of tax is warranted. This is one reason why the

current system in many countries of imposing higher marginal tax rates on income support recipients may be appropriate.

On the other hand, a move towards a negative income tax type system, with fewer activity requirements on recipients, would require a lower set of marginal tax rates in order to be optimal. This has implications for Australian family payments, which are paid to low-income families with children. Because there is no administrative requirement of job search, it is particularly important to ensure that the marginal tax rates associated with these payments do not discourage efforts to increase incomes.

Perhaps the most interesting feature of this review, however, is the way it has pointed to the centrality of the goals of social policy in influencing the optimal structure of marginal tax rates. Within the optimal tax literature, the conventional approach has been to evaluate policy in terms of the extent to which an aggregation of individual welfare levels is maximised. These welfare levels are a function of both individual leisure and income. This 'welfarist' approach accounts for variation in social values by using an aggregation function that places greater or less weight on the welfare levels of people at either the top or bottom of the income distribution.

However, an alternative source of variation in social values stems from alternative views on the concept of individual welfare that is to be maximised. A number of non-welfarist concepts are commonly used in public discourse, and the implications of some of these have been reviewed in Section 4.

One of the conclusions of the welfarist approach is that the optimal tax/benefit structure should be designed so that those people with the lowest skills do not work. This conclusion does not concord with much policy discourse, which implicitly places a low, or even negative, value on the leisure of the poor. Whilst alternative value approaches have only just begun to be incorporated into economic tax theory, a number of results appear to be emerging from the literature.

These have focused on the impact of using poverty alleviation as the social goal, rather than welfare maximisation. This has two differences from the welfarist approach. First, it implies a particular focus on those

below the poverty line, and second, it places zero value on the leisure of the poor, being concerned only with their income.

- Compared to a welfarist measure, a poverty alleviation approach tends to lead to somewhat higher marginal tax rates. This result appears to be driven by the greater need to focus resources on those below the poverty line.
- In simulations with relatively inelastic labour supply, some research suggests that quite high marginal tax rates at the very bottom of the income distribution may be optimal (around 90 per cent at the 10th percentile of the wage distribution).
- The marginal tax rate on the poor is greater the lower is the poverty line. This is because a higher poverty line means that more people will be affected by the associated tax rates.
- Assigning more importance to the incomes of the poorest of the poor leads to an increase in marginal tax rates.

Despite these differences with the welfarist approach, simulations still suggest that it will be optimal to have those with the lowest skills idle. This is because strongly negative tax rates will be required to encourage them to work, which will in turn require high tax rates for people with higher incomes.

It is possible, however, that even this conclusion would be altered if one were to ascribe a negative value to the leisure of the poor. This can be motivated either by an appeal to more dynamic notions of welfare (assuming that the poor are myopic) or by notions of ethics of exchange: a view that in return for assistance, the poor must supply labour. If these views are held, this is more likely to imply a case for low (and possibly negative) marginal tax rates on labour income for the poor, and/or alterations in labour supply behaviour via administrative regulations on the receipt of benefits.

Finally, economic researchers have begun to examine the effect of these administrative arrangements for the design of income testing arrangements. The interpretation of these in terms of labour supply effects has already been mentioned above. Besley and Coate (1992 and

1995) find that when fully effective labour incentive programs such as workfare are available, it can be optimal to tax the lowest skill workers at 100 per cent. This assumes a poverty alleviation objective of social policy. On the other hand, the welfarist approach which takes account of the negative impact on respondents of these administrative requirements (formalised in their model as a loss of leisure, but also interpretable more generally), then programs such as workfare are never optimal, and marginal tax rates should be lower.

This diversity of conclusions when using different social criteria itself provides one argument against tight targeting. As Atkinson notes:

The attractiveness of targeting depends on how narrowly defined are the objectives of policy and on how much agreement there is about the form of those objectives ... A highly targeted income guarantee may perform less well when judged according to less sharp criteria and according to objectives other than poverty alleviation. (Atkinson, 1995: 64).

## **Research Directions**

Whilst research based on the economic theory of optimal taxes is thus beginning to provide broad guidelines to tax/benefit policies, it should be clear from the review presented here that there are important unanswered questions. One of the main factors limiting research in this area is the mathematical complexity of models that only encompass the simplest facets of the operation of social systems. This limitation is now receding along with dramatic falls in computing costs, and hence we are likely to see a significant expansion of research in this area in the near future. We therefore conclude this review with a discussion of some of the key areas where further research might be profitable.

To date, the modelling of the sensitivity of results to labour supply assumptions has been relatively limited. It is possible that extensions to current models, which allow substitution and income effects to vary with income, might change some of the conclusions presented here.

The most important areas identified in this review, however, involve moving beyond the standard optimal tax framework. In particular, three areas are identified.

- Discussion of the different non-welfarist approaches to social welfare optimisation, and understanding the implications of these alternatives for policy.
- Incorporation of the administrative features of programs. Administrative structures have implications for the optimal structure of income testing and associated taxation issues. The exploration of these issues has only begun.
- Understanding the interactions of the labour supply issues considered here with the demand side of the labour market. Partly because much of the existing literature is of North American origin, there has been very little attention paid to the interaction of taxation, labour supply and labour market rigidities (such as empirically significant minimum wages).

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