

# The antipoverty performance of universal and means- tested benefits with costly take-up

*Alari Paulus*

Discussion Paper No. 16/12  
April 2016

**Poverty Reduction in Europe:**  
Social Policy and Innovation



FUNDED BY THE  
7TH FRAMEWORK PROGRAMME OF THE EUROPEAN UNION

## **Acknowledgements**

The research for this paper has benefited from financial support by the European Union's Seventh Framework Programme (FP7/2012-2016) under grant agreement n° 290613 (ImPRovE: Poverty Reduction in Europe: Social Policy and Innovation; <http://improve-research.eu>) and helpful comments received from Karel Van den Bosch, the project members and the participants of a seminar at Bank of Estonia. The author is solely responsible for any remaining shortcomings and errors.

April 2016

© Alari Paulus

## **Bibliographic Information**

Paulus A. (2016), *The antipoverty performance of universal and means-tested benefits with costly take-up*, ImPRovE Working Paper N°16/12. Antwerp: Herman Deleeck Centre for Social Policy – University of Antwerp.

Information may be quoted provided the source is stated accurately and clearly.

Reproduction for own/internal use is permitted.

This paper can be downloaded from our website: <http://improve-research.eu>



# Table of Contents

<b>Abstract</b>	<b>4</b>
<b>1 Introduction</b>	<b>5</b>
<b>2 Related literature</b>	<b>7</b>
<b>3 Theoretical framework</b>	<b>10</b>
3.1 Welfare participation with no take-up costs . . . . .	11
3.2 Welfare participation with costly take-up . . . . .	14
<b>4 Numeric simulations</b>	<b>15</b>
4.1 Welfare participation with no take-up costs . . . . .	16
4.2 Welfare participation with costly take-up . . . . .	23
<b>5 Conclusion</b>	<b>27</b>
<b>References</b>	<b>30</b>

# Abstract

We assess the optimal design of transfers in the context of poverty alleviation and welfarist objectives. We extend the analytical framework of Creedy (1997) with costly benefit take-up – a common characteristics of means-tested schemes in particular – to study how this affects the take-up of benefits and the optimal choice between means-tested and universal benefits. Numeric simulations reveal that take-up costs can increase social welfare and reduce poverty rates achieved with means-tested schemes by inducing people to increase their work effort. Universal benefits generally still outperform means-tested schemes on the basis of social welfare and poverty measures when these are adjusted for take-up costs.

**Keywords:** optimal transfers, means-testing, take-up, poverty

**JEL codes:** H21, H24, H31, I38

# 1 Introduction

Modern welfare states provide financial support to individuals and families to ensure everyone has at least a minimal level of resources at their disposal. A principal question for the design of a welfare system concerns whether such transfers should be universally available (to all) or targeted to those with inadequate resources, that is means-tested.<sup>1</sup> It seems a natural idea to concentrate (limited) resources to those most in need and effective targeting has been at forefront in the design of poverty alleviation programmes going back at least to Beckerman (1979). Strong pressures on public finances in recent years have further intensified such debates and in several occasions led to increased reliance on means-tested benefits as the preferred form of support.<sup>2</sup>

A focus on effective targeting alone may be however too limiting. First, optimal targeting may lead to less resources being allocated to a particular group of people when their needs increase, the so-called ‘paradox of targeting’ (Keen, 1992; Ebert, 2005).<sup>3</sup> Second, target efficiency measures are not concerned with how much poverty is reduced per se and unit efficiency could be (inversely) related to the scale of a transfer program.<sup>4</sup> Third, the level of target income itself is open to debate and it maybe difficult to agree on the most appropriate poverty line (Atkinson, 1995a, p. 233). Fourth, an important characteristic of value judgements implicitly underlying targeting is that no value is attached to the resources going to non-poor and no weight is attached to poor’s leisure (see e.g. Creedy, 1998). At the extreme, if one is only concerned, say, with a reduction of the head-count poverty rate then the most efficient (and cynical) way to achieve that is targeting people just under the poverty line. However, government’s objectives are generally wider and poverty alleviation only one of the goals of the welfare system (Atkinson, 1995a, 1999). Fifth, as already emphasised by Kesselman and Garfinkel (1978), target efficiency is not a measure of economic efficiency as it does not reflect people’s behavioural responses. They point out that target efficiency, defined as the share of transfers going to the target group (e.g. pre-transfer poor), reflect some kind of technical efficiency which is of limited use as it focuses on gross rather than the net cost of the program.

---

<sup>1</sup>More specifically, we discuss income-testing throughout the paper and do not cover other forms of means (e.g. assets). We consider universalism in the Beveridgean sense where the benefit receipt can be contingent on the characteristics of an individual or a family but not their income.

<sup>2</sup>Examples include turning a universal child benefit (gradually) into a means-tested benefit in Lithuania (2009-12); an introduction of a means-tested child benefit to supplement a universal one in Estonia (2013); and excluding high income families from a previously universal child benefit in the UK (2013).

<sup>3</sup>This can occur because the cost of support to a group with increased needs becomes higher and as a result some resources are reallocated to groups who are less expensive to help.

<sup>4</sup>Throughout, we consider target efficiency with respect to income levels. The literature on ‘tagging’ is more oriented toward non-monetary dimensions.

The case for means-testing becomes less clear in particular, when potential adverse effects on work incentives are taken into account. Income testing means that benefit entitlement is (gradually) scaled back on the basis of other incomes (earnings) available to the individual or household, hence affecting work incentives both at the extensive margin (participation) and intensive margin (work intensity). By how much benefit entitlement is reduced for a unit of other income is reflected in the benefit withdrawal rate, essentially representing an additional marginal tax rate on incomes. The higher the withdrawal rate, the higher such an implicit tax rate. Benefit targeting on the basis of incomes therefore involves a trade-off with economic efficiency.<sup>5</sup> With labour supply responses (i.e. endogenous incomes), and the poverty line set at a meaningful level, it is generally not possible to eliminate poverty altogether. This is in a stark contrast with the target-efficiency approach assuming fixed incomes.

Several further complexities rise when applying means-tested schemes in practice: targeting can involve errors (exclusion and leakage), and means-testing is typically associated with higher claiming and administration costs and lower take-up compared to universal benefits.<sup>6</sup> All this makes the choice between universal and means-tested benefits less trivial.

We study how the optimal transfer design is influenced by costly benefit take-up, both from the viewpoint of poverty alleviation (income maintenance) and welfarist approach (utility maintenance) to account for different value judgements. To our knowledge, take-up or claiming costs have not been addressed in the context of optimal transfer design. Costs associated with benefit claiming affect work decisions through complex interactions and have fiscal and distributional implications. We seek to answer whether the costs associated with benefit claiming, through the impact on take-up behaviour, affect which type of transfer program is more optimal. We compare the performance of means-tested and universal benefit schemes following the approach of Creedy (1997) and extend it with costly benefit take-up. Our main finding is that claiming costs can improve social welfare and poverty outcomes for means-tested schemes as it results in increased work effort. A universal benefit, however, still tends to dominate social welfare outcomes and also in terms of poverty alleviation as long as net incomes are adjusted for claiming costs.

---

<sup>5</sup>Incentive problems of means-tested benefits were already highlighted in the famous Beveridge (1942) report on the UK social insurance system (p. 8): ‘if children’s allowances are given only when earnings are interrupted and are not given during earning also, two evils are unavoidable. First, a substantial measure of acute want will remain among the lower paid workers as the accompaniment of large families. Second, in all such cases, income will be greater during unemployment or other interruptions of work than during work.’

<sup>6</sup>Nevertheless, the complexity of programs can also serve as a screening device. Kleven and Kopczuk (2011) consider complexity as part of policy instruments and show that optimal programs can be highly complex.

The rest of the paper is divided as follows. Section 2 discusses literature addressing the optimal design of transfers; Section 3 provides theoretical framework and Section 4 presents results on the basis of numeric simulations. Finally, Section 5 concludes.

## 2 Related literature

We start with an overview of existing literature on the optimal design of transfers. At the broad level, there are two relevant strands in economics, which address the role and potential of benefit means-testing. One is largely empirical line of work in the context of poverty alleviation, explicitly considering the design of transfers and focusing on their targeting accuracy but with little regard for potential work disincentive effects.<sup>7</sup> Without taking account of efficiency (or other behavioural) effects, it is trivial to see that means-tested benefits can target perfectly and may even dominate universal transfers on the basis of certain social welfare measures (not valuing leisure), e.g. Creedy (1996). By construction, perfect (income) targeting requires a 100% benefit withdrawal rate on the poor. However, even when taking incomes as given (i.e. exogenous), it might be possible to construct categorical benefits conditioned on easily observable individual or household characteristics (other than income but highly correlated with that), which could achieve a comparable level of target efficiency. Furthermore, claiming costs can make universal benefits preferred in equal-poverty comparisons, though numeric simulations suggest that the costs would have to be relatively high (Besley, 1990).

On the other hand, there is extensive (theoretical) literature on optimum income tax, initiated by Mirrlees (1971), where efficiency loss in terms of labour market distortions and its trade-off with equity considerations are central.<sup>8</sup> The trade-off arises from a screening problem as the government is unable to observe individual income-generating abilities, leading the optimum tax literature to concentrate on second-best approaches relying on observable characteristics (mainly income). While most of optimum tax research focuses on social welfare maximising tax rates on labour income (for a given government revenue requirement), there are also studies (e.g. Kanbur et al., 1994; Besley and Coate, 1995; Kanbur et al., 2006) which consider a different objective function – poverty alleviation – arguing this to be more in line

---

<sup>7</sup>There are broadly two approaches: micro-level studies assessing a single system or instrument and macro-level studies looking at the relationship between the reliance on benefit targeting (or concentration) and income inequality and poverty at the country level.

<sup>8</sup>See Mirrlees et al. (2010), Boadway (2012) and Piketty and Saez (2013) for recent comprehensive reviews and Kaplow (2007) with an emphasis on optimal income transfers in the context of that literature.

with actual policy discussions. With either set-up, allowing for flexible labour supply makes the case for means-tested transfers much less clear.

The literature emphasises the need to consider the combined (composite) tax schedule, i.e. income taxes together with transfers, across the whole income spectrum and cautions against looking at certain income ranges (Mirrlees, 1971) or instruments (Kaplow, 2007) in isolation. There is however little (explicit) attention to which specific instruments should be used to achieve that and, in particular, which type of transfers. In fact, Mirrlees (1971) could not even provide firm analytical conclusions on the shape of (non-linear) optimum tax schedule as it depends on the distribution of skills and the labour-consumption preferences of the population. At the general level he was able to offer only a few and limited insights: that optimal marginal tax rates would range from zero to one and that it is optimal to have not everyone working. The first of these – the non-negativity result – has been later found to be circumstantial: Kanbur et al. (1994) demonstrated that the optimal marginal rate on the poorest is strictly negative when instead of maximising social welfare, the objective function is poverty alleviation; Saez (2002) showed that negative marginal tax rates on low earnings (i.e. subsidies) can be optimal when labour supply responses are concentrated on the extensive (rather than intensive) margin.<sup>9</sup> Besley and Coate (1995) explore more specifically the optimal design of an income maintenance scheme: the least costly programme which ensures that everyone reaches a target income level. They find that, in the second-best scenario when individual abilities are not observed, the optimal benefit schedule exhibits means-testing (with less than a 100% withdrawal rate).<sup>10</sup>

To draw more specific conclusions, Mirrlees and later authors have relied on numeric simulations, making assumptions about utility and social welfare function and the distribution of wages, yet the optimal profile of marginal tax rates is still a contested issue and being debated – cf. Mankiw et al. (2009) and Diamond and Saez (2011). Early literature tends to indicate support for income transfers (i.e. a negative tax liability) at the bottom of the income distribution and (mostly) decreasing marginal tax rates, which would be consistent with means-testing. However, results from different studies vary considerably in terms of the level and steepness of the tax schedule: Mirrlees (1971) found relatively low tax rates and little rate graduation while Tuomala (1990) and Kanbur and Tuomala (1994), for example, point

---

<sup>9</sup>Interestingly, as discussed in Saez (2002, p. 1050), the result of negative marginal tax rates does not hold when the government is mostly concerned about the wellbeing of the worse-off individuals.

<sup>10</sup>However, as shown by Besley and Coate (1995), it does not preserve the key features of the first-best solution, which involves conditional income transfers and require recipients to exercise maximum work effort according to their abilities. The size of transfers is inversely related to the level of ability, ensuring perfect targeting. In the second-best scenario, targeting efficiency is imperfect due to benefit leakage.



toward greater non-linearity and higher tax rates, though they remain generally much below 100%. Later studies (Diamond, 1998; Saez, 2001) have also suggested a U-shape pattern where marginal tax rates decline first but increase for the top income distribution. However, optimum marginal tax rates specifically for the lowest income groups – our key interest – remain ambiguous with non-linear tax schedules in the standard Mirrleesian framework. This is because, based on numeric simulations (e.g. Mirrlees, 1971; Kanbur and Tuomala, 1994), optimal marginal tax rates seem to *increase* first, peaking around the 5-10th percentile of population, before decreasing. Obtaining a very detailed tax schedule where optimal rates are distinguished for very narrow income ranges is questionable though, as it is likely to be highly sensitive to the (assumed) population density in that region (and population characteristics). Focusing instead on piecewise-linear tax schedules could therefore provide more robust results.

Kesselman and Garfinkel (1978) was the first analysis to explicitly consider the optimality of means-testing in a linear tax framework. They contrasted a scheme with a universal payment and a uniform marginal tax rate, referring to this as a credit income tax (CIT) – and known as a basic income/flat tax (BI/FT) scheme in later literature (e.g. Atkinson, 1995b) – with a negative income tax (NIT) scheme. A (linear) NIT features a two-segment piecewise-linear tax schedule where tax liability at low income levels is negative, corresponding to a transfer which is gradually withdrawn against earnings, and becomes positive above a certain income level. The effective marginal tax rate for beneficiaries is assumed to exceed that for net tax payers (see e.g. Moffitt, 2003).<sup>11</sup> Note that the two schemes are (mathematically) equivalent when the two tax rates are identical.<sup>12</sup> Even though Kesselman and Garfinkel (1978) limit their analysis to a two-person economy to avoid specifying an explicit social welfare function, they are unable to establish a clear ranking between the two schemes in terms of economic efficiency. Their results point to only small distortive efficiency differences (in either direction) and they conclude that the CIT might be then preferred over the NIT on the grounds of administrative efficiency.

---

<sup>11</sup>Kesselman and Garfinkel (1978) further distinguish between *fully integrated* and *overlapping* NIT systems, depending on whether the personal exemption in the positive tax is equal to or below the break-even income level.

<sup>12</sup>Despite equivalence in terms of net income in the special case, there could be differences in other dimensions. For example, basic income could be paid *ex ante* rather than *ex post* once earnings and (positive) tax liability are known. More generally, Kesselman and Garfinkel (1978) point out divergent marginal rates and netting out of taxes in the payment of transfer benefits as the dual aspects of income testing (in the NIT context). Some papers restrict NIT to the special case of a single uniform marginal tax rate and only consider the administrative dimension (i.e. net vs gross payments) when distinguishing between universal and means-tested schemes (e.g. Tondani, 2009) or abstract from these income-testing aspects entirely (e.g. Thompson, 2012). In our discussion, we focus on the first aspect (i.e. different tax rates) and refer to any two-bracket linear tax as a negative income tax.

Slemrod et al. (1994) carry out numeric simulations for a full (hypothetical) wage distribution and find that a two-bracket system outperforms a single-rate tax. However, the gains appear modest and very sensitive to the chosen parameters, leading them also to conclude that dual rates may not be sufficient to outweigh administration costs. Importantly, they find that optimal marginal rates are regressive (though the system is still progressive due to increasing average tax rates) in line with prior studies on non-linear optimum schedules. Recent advances in the dynamic context (e.g. Strawczynski, 1998; Hsu and Yang, 2013) have however indicated the scope for piece-wise linear schedules with increasing marginal tax rates.

Lambert (1990), on the other hand, showed that a single-rate tax dominates dual-rate taxes in terms of the output possibility curve defined in the space of total (or average) income and the inequality of income. Creedy (1997) extends that to social welfare measures defined in terms of utility as well as poverty measures, showing that the BI/FT system almost always performs better. We discuss his modelling framework in detail in the next section.

There is also a notable strand, which analyses the desirability of work requirements for transfers (‘workfare’) generally (e.g. Besley and Coate, 1995; Brett, 1998; Cuff, 2000; Moffitt, 2006) or in-work benefits<sup>13</sup> more specifically (e.g. Saez, 2002; Immervoll et al., 2007; Rothstein, 2010; Brewer et al., 2010). This is somewhat out of the scope of our paper as we are concerned with the welfare and sufficient incomes of both working and non-working population, for example as not everyone is capable to work or able to find work, hence we do not go into further details here.

### 3 Theoretical framework

We draw on the piece-wise linear tax/transfer model of Creedy (1997) to contrast universal and means-tested benefits, extending it further with costly benefit take-up related to disutility arising from the participation in a means-tested scheme (‘welfare program’). As common in the optimal income tax literature, the role of government in this framework is to tax incomes (earnings) to fund transfers (and other expenditure), taking individual labour supply responses into account. Individuals decide their optimal labour supply, taking the tax-transfer system as given. To accommodate different value judgements when comparing various tax-transfer schemes, we discuss both a welfarist approach (utility maintenance) as well poverty alleviation (income maintenance).

---

<sup>13</sup>Like the Earned Income Tax Credit (EITC) in the US and the Working Family Tax Credit (WFTC) in the UK.

### 3.1 Welfare participation with no take-up costs

We start from a case where participation in a welfare program has no associated utility cost and, hence, each individual's utility is determined by consumption ( $c$ ) and hours of leisure ( $h$ ) alone. We employ a Cobb-Douglas type of utility function (with constant returns to scale):  $u(c, h) = c^\alpha h^{1-\alpha}$ , where  $0 < \alpha < 1$  and  $u$  depends positively on  $c$  and  $h$ .<sup>14</sup> Total hours are normalised to one. We assume a fixed wage rate  $w$  (omitting the subscript  $i$  to denote an individual). Gross earnings are then  $y = w(1 - h)$ .

First, let us consider a scheme with a universal transfer and a strictly proportional tax, i.e. a basic income/flat tax scheme (BI/FT). All private income is taxed at a constant marginal tax rate  $t$  and there is a universal benefit  $b$  which everyone receives. Net income and consumption (with the price of consumption goods also normalised to one) is  $c_B = w(1 - h)(1 - t) + b$ . The optimal labour supply in this case is simply obtained from the first order condition,  $\partial u / \partial h = 0$ :

$$h_B^* = \frac{(1 - \alpha)}{w(1 - t)} M_B \quad (1)$$

where  $M_B = w(1 - t) + b$ , i.e. virtual income. As a characteristic of Cobb-Douglas function, work hours would be independent of the wage rate and equal to  $\alpha$  if there were no transfers ( $b = 0$ ). Total income with optimum labour supply is  $\alpha [w(1 - t) + b]$ . A person chooses to work when  $h_B^* < 1$ , in which case the wage rate must exceed the following level:

$$w_B^L = \frac{(1 - \alpha)b}{\alpha(1 - t)} \quad (2)$$

Those with wage rate below  $w_B^L$  prefer to stay out of work and have total income equal to  $b$ .<sup>15</sup>

Second, we consider a linear (positive) tax in combination with a means-tested benefit. It is effectively a negative income tax (NIT) with a positive tax rate  $t$  applied above a threshold  $a$  and a negative tax rate applied below the threshold. The means-tested benefit is inversely related to (gross) earnings (using the same income threshold):  $s(a - y)$  if  $y \leq a$ , where  $s$  is the benefit withdrawal rate (assuming  $s > 0$

---

<sup>14</sup>Cobb-Douglas function features unit elasticity of substitution between consumption and leisure, and represents a special case of the CES function.

<sup>15</sup>As pointed out by Kanbur et al. (1994, p. 1625), with Cobb-Douglas type of preferences and a lognormal wage distribution, the marginal tax rate would need to be infinitely negative at the bottom of the distribution to make everyone choose to work.

and  $t + s \leq 1$ ). Net income is then

$$c_N = \begin{cases} y + t(a - y) + s(a - y) & \text{if } y \leq a \\ y - t(y - a) & \text{if } y > a \end{cases} \quad (3)$$

This is a flexible system, which can accommodate a variety of special cases by opting for particular values of  $s$ . With  $s = (1 - t)$  we have a minimum income guarantee (MIG) scheme with a 100% withdrawal rate; while  $s = 0$  corresponds to a basic income/flat tax scheme with  $b = at$ . Our approach is slightly different from Creedy (1997) who considered  $t + s$  as a single composite rate. We distinguish between the two rates below the threshold  $a$ , so that we can later on relax the assumption about people always claiming the means-tested benefit while the tax burden (marginal tax rate on earnings) is not affected by the claiming decision. That is, taxes are always applied, for example, by being automatically withheld as is common in practice.

The budget constraint is piece-wise linear. It is useful to consider optimal labour in each segment. First, take a person with earnings above the threshold  $a$  and hence not entitled to the means-tested benefit. In analog to the BI/FT scheme,

$$h_t^* = \frac{(1 - \alpha)}{w(1 - t)} M_t \quad (4)$$

where  $M_t = w(1 - t) + at$ . Total income with optimal labour supply is  $\alpha [w(1 - t) + at]$ . Second, consider a person with earnings below the threshold  $a$  and in addition receiving the means-tested benefit. (With convex individual preferences, the budget kink point at the threshold  $a$  and its immediate vicinity cannot represent an optimal choice, which causes a gap in the distribution of earnings and benefit entitlement. That is, people choose hours of work such that they are either not eligible to the benefit or entitled to a certain minimum amount, ruling out very small positive entitlements.) The optimal hours of leisure are

$$h_s^* = \frac{(1 - \alpha)}{w(1 - t - s)} M_s \quad (5)$$

where  $M_s = w(1 - t - s) + a(t + s)$ . Total income is  $\alpha [w(1 - t - s) + a(t + s)]$ . Finally, the condition for an individual to prefer working is  $h_s^* < 1$ , which translates into the following wage condition:

$$w > \frac{(1 - \alpha)a(t + s)}{\alpha(1 - t - s)} = w_s^L \quad (6)$$

People with low earning potential ( $w \leq w_s^L$ ) choose not to work and have income equal to  $a(t + s)$ .

Budget constraints under the two schemes are depicted in Figure 1. It shows graphically how the budget constraint changes when we move from a BI/FT scheme to a NIT. Keeping the tax rate  $t$  fixed, guaranteed income is more generous with the NIT ( $a(t + s) > b$ ) even though  $at < b$  to preserve budget neutrality. In other words, NIT provides higher incomes for low income earners while increases taxes on high income earners (by lowering the tax-free threshold).

Figure 1: Budget constraint

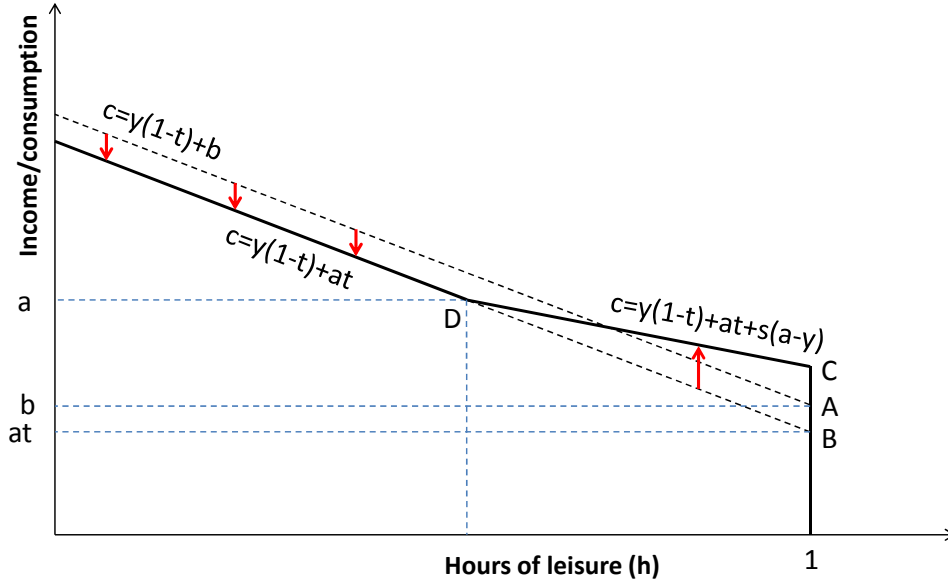


Table 1 compares work incentive indicators for the two schemes: the effective marginal tax rate (EMTR) and the participation tax rate (PTR). EMTR depicts work incentives at the intensive margin (for employed), showing what proportion of additional income is taxed away, earned when increasing work hours marginally:  $EMTR = 1 - \Delta c / \Delta y$ . PTR characterises incentives at the extensive margin, measuring how favourable the employment option is compared with the outside work option, i.e. the proportion of gross earnings foregone due to taxes and withdrawn benefits:  $PTR = 1 - \Delta c / y = 1 - (c - B) / y$  where  $B$  is the outside work option. (Note that  $B = b$  for the BI/FT scheme and  $B = t(s + a)$  for the means-tested scheme.) With the BI/FT scheme, the effective tax rate at either margin is  $t$ , increasing to  $t + s$  for benefit recipients under the means-tested scheme.<sup>16</sup> While the EMTR for non-recipients under the means-tested scheme is not affected, the PTR

<sup>16</sup>For those, who move above the threshold  $a$  as a result of a marginal increment in gross earnings, the EMTR falls gradually from  $t + s$  to  $t$ .

is higher as the outside option is now more generous and decreases in income: the PTR ranges from  $t + s$  to  $t$ .

Table 1: Effective marginal tax rate and participation tax rate

	EMTR	PTR
Basic income/flat tax	$t$	$t$
Means-tested benefit/NIT		
benefit recipient	$t + s$	$t + s$
non-recipient	$t$	$t + as/y$

### 3.2 Welfare participation with costly take-up

In the next step, we extend this framework by relaxing the initial (implicit) assumption of full and costless take-up of means-tested benefits and instead allow people to choose whether to participate in the welfare program ( $P = 1$ ) or not ( $P = 0$ ) in the presence of costs related to take-up. The decision process is modelled as weighing monetary gains against potential disutility from the participation. The latter is considered in generic terms and can reflect different types of costs in various dimensions: information barriers, time and effort needed to make a claim, social stigma etc. Disutility could hence be seen arising both from monetary or non-monetary costs involved. For surveys of take-up literature, see Moffitt (1992), Currie (2004), Hernanz et al. (2004). There are only a few examples of modelling policy reform with endogenous take up, e.g. Pudney et al. (2006).

We distinguish between variable and fixed costs similar to Moffitt (1983), by introducing additional parameters in the utility function:

$$U = u(z + \gamma BP, h) - \phi P \quad (7)$$

where  $z$  is net earnings<sup>17</sup>,  $B$  means-tested benefit and  $P$  denotes program participation.  $\gamma < 1$  reflects variable costs depending on potential entitlement and  $\phi > 0$  fixed costs.<sup>18</sup>  $\gamma < 1$  means that the utility obtained from a marginal unit of means-tested benefit is lower than that from earnings or the universal benefit. With  $\gamma = 1$  and  $\phi = 0$ , there is no disutility associated with (claiming) a means-tested benefit and we are back to the initial case.

<sup>17</sup>Together with the universal benefit, that is  $z_B = y(1-t) + b$  under BI/FT and  $z_M = y - t(y-a)$  under MT/NIT.

<sup>18</sup>Moffitt (1983) found little empirical support for variable costs, however, and e.g. Keane and Moffitt (1998) consider only a fixed cost element. We retain both types of costs to keep the framework as general as possible.

For a person with earnings above the threshold  $a$  and hence not eligible for the means-tested benefit, the optimal hours remain as before (eq. 4). For a person with earnings below the threshold  $a$  and eligible for the means-tested benefit, the optimal hours of leisure are (taking participation  $P$  as given)

$$h_c^* = \frac{(1 - \alpha)}{w(1 - t - \gamma sP)} M_c \quad (8)$$

where  $M_c = w(1 - t - \gamma sP) + a(t + \gamma sP)$ .

By substituting equation (8) into (7) one can determine the utility maximising value of  $P$ , i.e. whether it is worthwhile to participate in the welfare program. This generally depends on the exact value of parameters in the utility function. As long as there is a fixed element of disutility involved ( $\phi > 0$ ), then the participation requires  $u[z(h_c^*) + \gamma B(h_c^*), h_c^*] - u[z(h_c^*), h_c^*] > \phi$ . Unless the fixed component ( $\phi$ ) is sufficiently large, it is always beneficial to claim the benefit when out of work.

If there is only a variable element of disutility ( $\gamma < 1$ ,  $\phi = 0$ ) then an individual always participates in the program as long as the marginal utility gain is positive (i.e.  $\gamma > 0$ ). It is also straightforward to see, after rewriting equation (8) as

$$h_c^* = (1 - \alpha) \left[ 1 + \frac{a(t + \gamma sP)}{w(1 - t - \gamma sP)} \right] \quad (9)$$

that  $h_c^*(P = 1) > h_c^*(P = 0)$ , as long as  $\gamma > 0$  and  $s > 0$ . In other words, less labour is supplied if the benefit is claimed (*ceteris paribus*). The choice of work hours is also negatively affected by  $\gamma$  as

$$\frac{\partial h_c^*}{\partial \gamma} = \frac{(1 - \alpha)asP}{w(1 - t - \gamma sP)^2} > 0 \quad (10)$$

When does work pay off? For that  $h_c^* < 1$  needs to hold and hence

$$w > \frac{(1 - \alpha)a(t + \gamma sP)}{\alpha(1 - t - \gamma sP)} = w_c^L \quad (11)$$

## 4 Numeric simulations

We carry out numeric simulations on a hypothetical population of 10 thousand people with unit wages drawn from a log-normal distribution,  $\ln w_i \sim N(10, 0.5)$ .<sup>19</sup> We use  $\alpha = 0.7$  for the Cobb-Douglas utility function (and later  $\alpha = 0.5$  and  $\alpha = 0.8$  to test the sensitivity of the results). We assume that the government

---

<sup>19</sup>Corresponding average gross wage, if everyone was working full-time, is about 28 thousand and median wage just below 22 thousand.

requires a net revenue of 2,000 per capita (for other public services) and employ a fixed poverty line of 10,000, which is 35% of mean wage and 46% of median gross (full-time) wage.<sup>20</sup> For evaluating social welfare, we use abbreviated functions of the form  $W = \bar{U}[1 - I(u)]$  as in Creedy (1997), where  $\bar{U}$  denotes average utility and  $I(u)$  is an inequality indicator of the distribution of individual utilities. We use two measures, the Atkinson index, with  $\epsilon = 0.5, 1$  (the latter denoting greater inequality aversion than the former), and the Gini coefficient. We also use a utilitarian social welfare function, which is simply the average level of individual utilities ( $W = \bar{U}$ ).

#### 4.1 Welfare participation with no take-up costs

We first compare the anti-poverty performance of the two types of scheme when welfare participation is assumed to have no utility costs. Figure 2 plots various poverty and social welfare indicators over a range of the linear tax rate  $t$  and, in the case of means-tested schemes, for selected withdrawal rates ( $s = 0.1, 0.3, 0.5, 0.65$ ).<sup>21</sup>

With the basic income/flat tax scheme (the black solid line), the poverty rate as measured with the three FGT-indicators first decreases slowly in  $t$ , then flattens out and, finally, starts to increase rapidly in  $t$ . The reason is straightforward: raising the tax rate initially increases tax revenues, allowing for a more generous universal benefit (in absolute terms) and hence helping more (working) people out of poverty. On the other hand, the share of people who reduce work hours or choose not to work also increases with the tax rate, thereby contributing to higher poverty incidence and/or intensity (see Figure 3).<sup>22</sup> At first, these are primarily people with low earning potential who would have been poor even if they had chosen to work maximum hours (i.e. working poor). At some point, disincentive effects become so large that people who otherwise would be able to generate enough earnings to stay above the poverty line, choose to work less or not to work and fall into poverty.<sup>23</sup> The largest poverty reduction is achieved when the opposite movements in and out of poverty balance each other, after which further tax hikes increase the poverty rate. In addition, a decreasing employment rate limits growth in tax revenues and

<sup>20</sup>Fixed poverty line is a common choice in the previous studies and simplifies the interpretation of results. Thompson (2012) explores the relationship between the parameters of an (essentially) BI/FT scheme and relative poverty with endogenous poverty lines.

<sup>21</sup>The range of tax rates is bounded from below due to the net revenue requirement and a non-negativity constraint of  $b$ .

<sup>22</sup>Note that with the chosen simulation parameters, the universal benefit never exceeds the poverty line. Non-working people hence remain always poor under the BI/FT scheme and the poverty cannot be eradicated.

<sup>23</sup>Using the expression from above for total (individual) income under BI/FT, the critical wage rate is  $w^* = \frac{1}{1-t} \left( \frac{1}{\alpha} z_0 - b \right)$ , where  $z_0$  is the poverty line. Substituting  $b$  from the government revenue constraint,  $\sum w(1-h)t = N(R+b)$ , where  $N$  is the total population and  $R$  (net) revenue requirement, we obtain  $w^* = \frac{1}{1-t} \left( \frac{1}{\alpha} z_0 - t\bar{y} + R \right)$ .



above a certain level additional increases in the tax rate result in lower tax revenues (the so-called Laffer curve).<sup>24</sup> Incomes now take a double hit from people working less and the benefit amount being reduced, and the poverty rate increases even more rapidly. Overall, this reflects the classical equity-efficiency trade-off. We can also see that the tax rate minimising the poverty rate is higher the more sensitive a poverty measure (FGT) is towards the very bottom income distribution. With more weight attached to the poorest individuals (whose only income is the benefit), the maximum poverty reduction is achieved closer to the point where the benefit payment is the largest.<sup>25</sup>

Similar dynamics (in a mirror picture) can be observed for social welfare measures: a higher tax rate  $t$  leads initially to improvements (increases) in the indicators and after peaking around similar  $t$  values as for poverty measures, social welfare starts declining. As with the FGT measures, the more sensitive is the inequality measure used for the social welfare function towards low incomes (i.e. a higher  $\alpha$  for the Atkinson index), the higher is the tax rate maximising social welfare. Overall, in terms of choosing the optimal tax rate  $t$ , there is no large contrast between the income maintenance and utility maintenance objective (as long as the latter incorporate some distributional concerns). The optimal tax rate is much lower when the social welfare function is purely utilitarian (i.e. average of individual utilities), yet above the minimum level necessary to fulfil the net revenue requirement. While the utilitarian social welfare function ignores how utility is distributed among individuals, the utility function still implies some redistribution as person's utility depends both on income and leisure – without any income utility would be zero, despite the maximum value of leisure.

We now turn to means-tested schemes (the coloured lines in Figure 2 and Figure 3). The results show that the basic income/flat tax scheme dominates means-testing both in terms of poverty alleviation and average utility (utilitarian social welfare) for all tax rate and withdrawal rate combinations, as well as distribution-adjusted social welfare functions for the welfare-maximising tax rate (or higher), and more so the higher is the withdrawal rate  $s$ .<sup>26</sup> This arises from weaker work incentives at the intensive and extensive margin as the effective marginal tax rates and the participation tax rates are higher with means-testing (for a given  $t$ ) – see Table 1. Only EMTRs for benefit non-recipients are unaffected. As a result, the propor-

---

<sup>24</sup>The relative value of the benefit, measured as a percentage of median net earnings of employed,  $w(1-h)(1-t)$ , increases in  $t$  as median earnings fall throughout.

<sup>25</sup>Kanbur et al. (1994) simulate optimal *non-linear* marginal tax rates for minimising poverty (FGT2 measure) and find that these are around 50-60% for net benefit recipients, then declining as income increases.

<sup>26</sup>Note that Creedy (1997) presented results for means-tested schemes for a given  $t$  holding the effective marginal tax rate constant, i.e.  $t + s$  in our case.

tion of non-working people is higher and average work hours for employed reduced, compared to having a universal benefit (alone).

Total consumption is reduced, despite out-of-work income being even higher for low  $t$  and medium-high  $s$  values. At higher tax rates, however, the BI/FT scheme provides a greater income for those not working relative to median net earnings (among employed), even exceeding the latter. This is possible as the receipt of universal transfer is independent of work decision, while with the means-tested scheme a 100% replacement rate (relative to the median) would mean that it would not pay off to work when earning below the median.

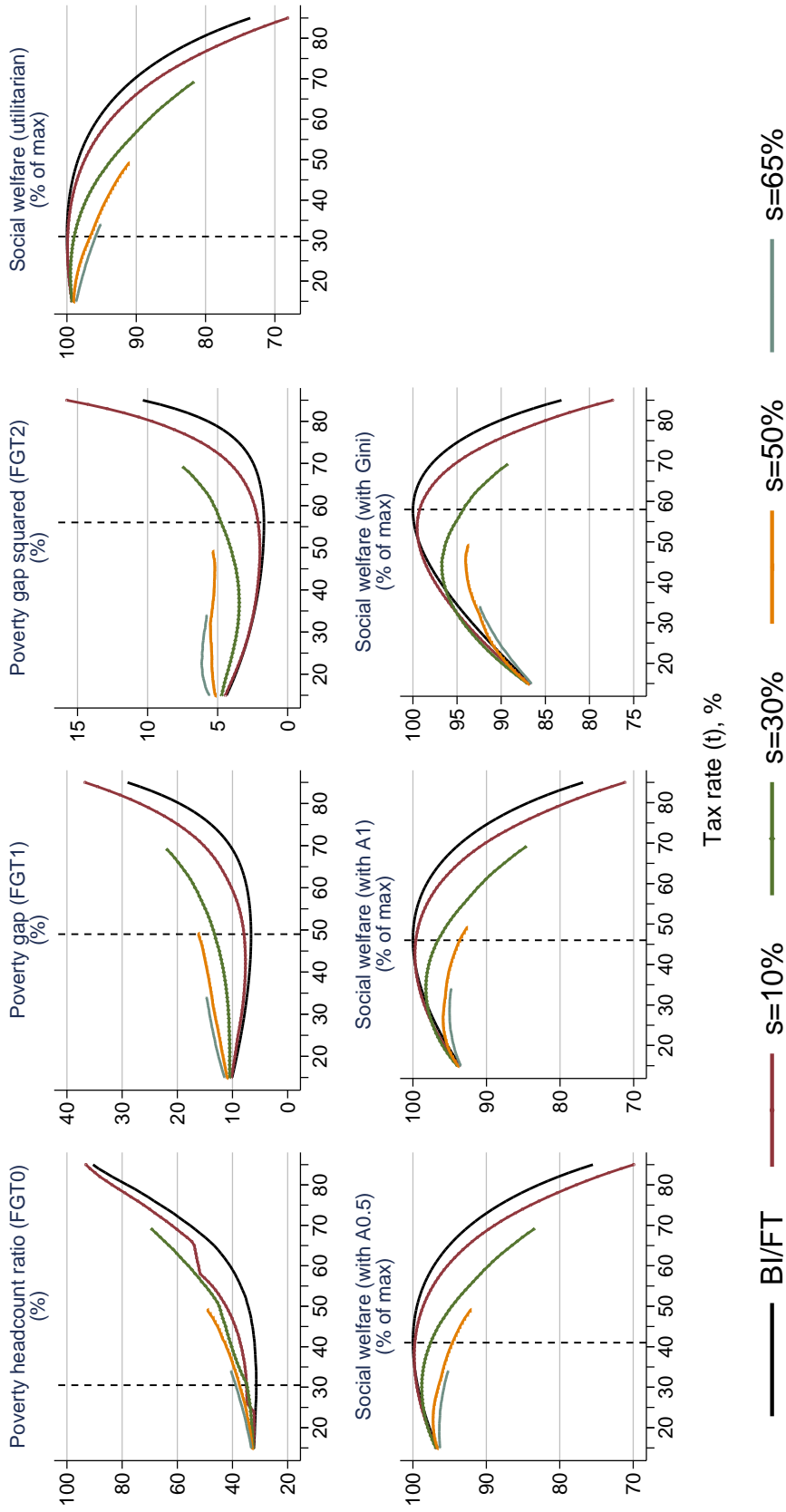
There are also clear patterns related to the share of people who work and receive the benefit. First, for a given  $s$ , the share of employed benefit recipients (in total population) initially increases in  $t$  due to extra tax revenues allowing for a larger  $a$  (in absolute terms) – meaning both a more generous benefit (as before) as well as a higher income threshold for means-testing and, hence, more eligible people. A higher tax rate also prompts people to reduce their work hours, which affects the number of recipients in two ways: new people become eligible as their earnings fall below the income threshold while some working claimants drop out of work altogether. At some point, further increases in  $t$  start reducing tax revenues and  $a$  falls as well. For low  $s$  values, the share of working people in receipt of the benefit may increase still due to new claimants. For high  $s$  values, the share of working recipients peaks (in terms of  $t$ ) before the maximum  $a$  is reached as more benefit recipients leave the work force. Once the effective marginal tax rate ( $t + s$ ) for benefit recipients approaches 100%, the number of working beneficiaries drops to zero.

Second, there are less benefit recipients in work the higher is  $s$  (for a given  $t$ ) as more of them choose not to work.<sup>27</sup> Overall, the differences between the means-tested schemes and BI/FT in terms of poverty reduction and social welfare are generally increasing in  $t$ . Differences are less pronounced only for poverty measures which are more sensitive towards the bottom income distribution (FGT2 and partly FGT1).

---

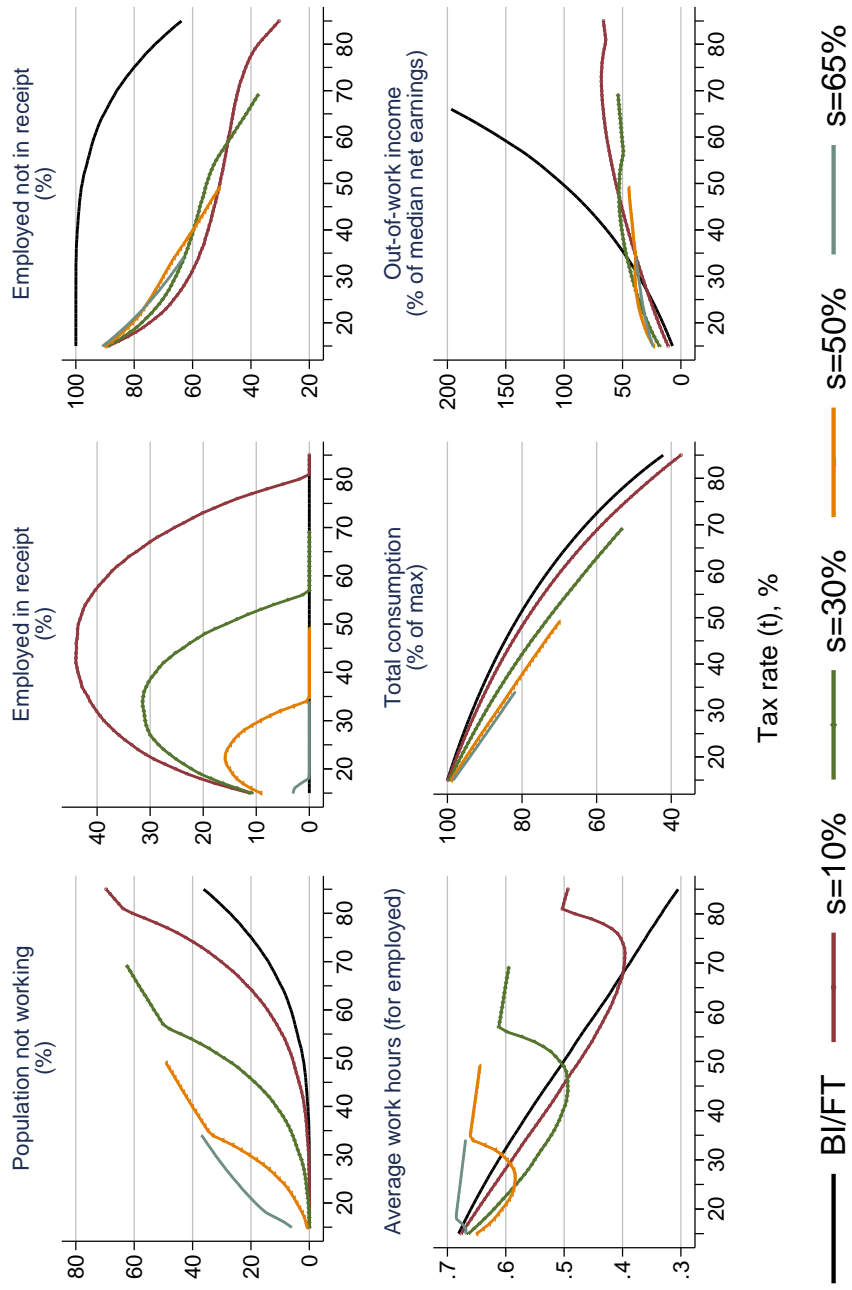
<sup>27</sup>The detrimental effect of high withdrawal rates has also been acknowledged in practice. Moffitt (2003) reports how withdrawal rates in the main cash transfer program in the US (Temporary Assistance for Needy Families) have been lowered in many states.

Figure 2: Poverty and social welfare with no take-up costs



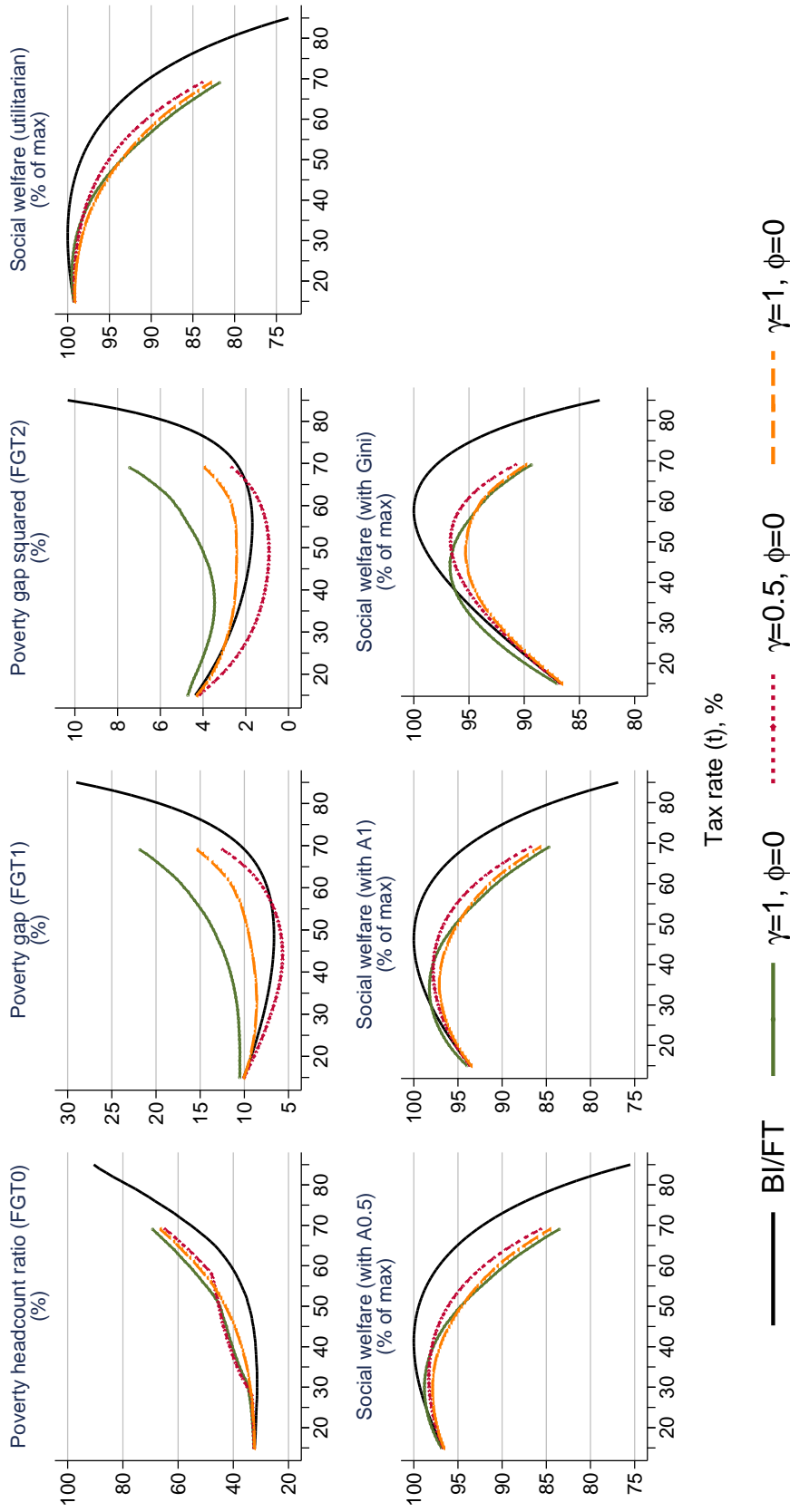
Notes: N=10000; mean/median FT gross wage=28261/21892,  $\alpha=7$ ; poverty line=10000; net revenue (per capita)=2000.

Figure 3: Labour market and incomes with no take-up costs



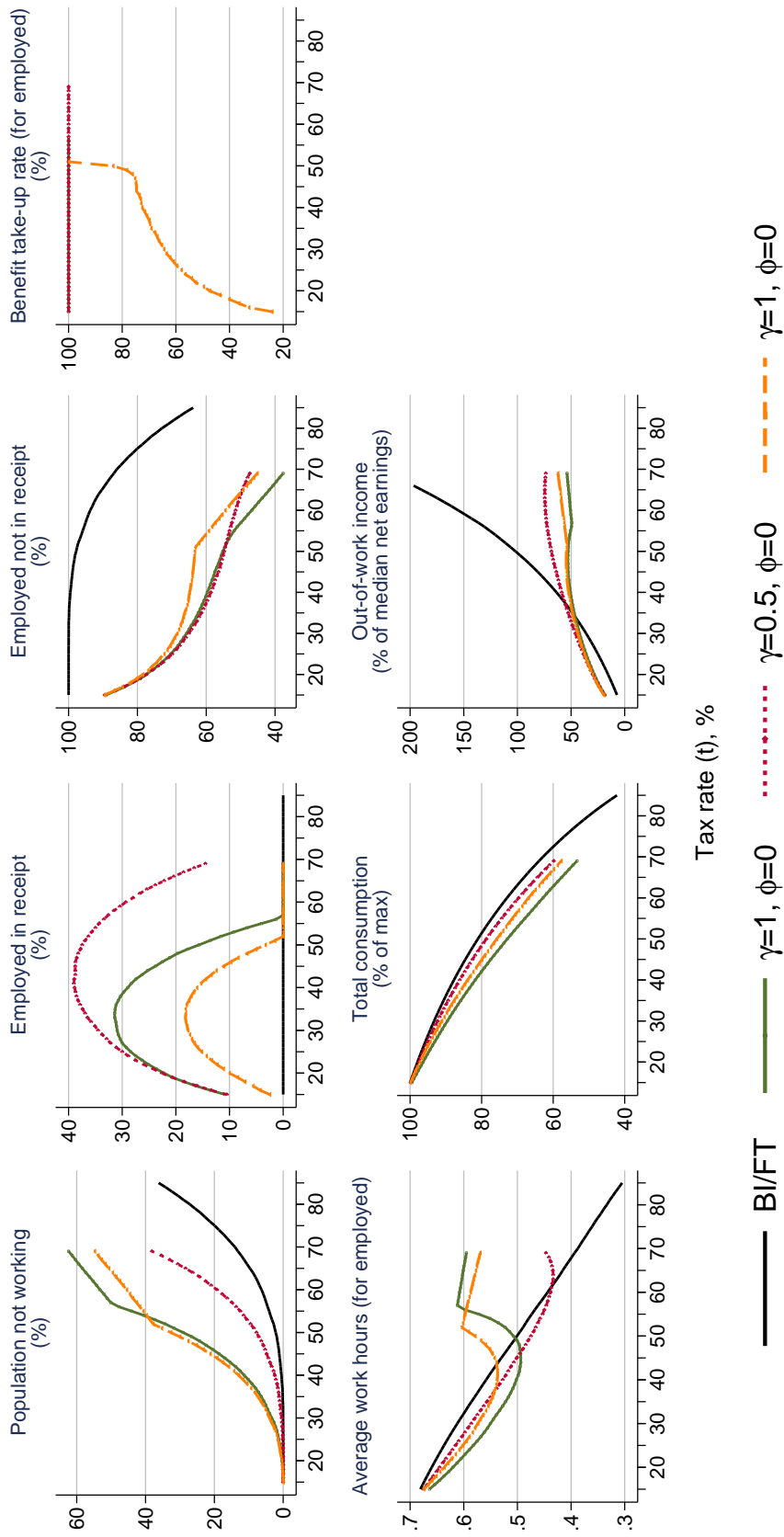
Notes: N=10000; mean/median FT gross wage=28261/21892;  $\alpha=7$ ; poverty line=10000; net revenue (per capita)=2000. Median net earnings is calculated for those with positive tax liability.

Figure 4: Poverty and social welfare with take-up costs (MT benefit withdrawal rate  $s = 30\%$ )



Notes: N=10000; mean/median FT gross wage=28261/21892,  $\alpha=7$ ; poverty line=10000; net revenue (per capita)=2000.

Figure 5: Labour market and incomes with take-up costs (MT benefit withdrawal rate  $s = 30\%$ )



Notes: N=10000; mean/median FT gross wage=28261/21892;  $\alpha=7$ ; poverty line=10000; net revenue (per capita)=2000. Median net earnings is calculated for those with positive tax liability.

## 4.2 Welfare participation with costly take-up

We now consider the implications of costs related to welfare participation, along the same dimensions. The results for the basic income/flat tax scheme are as before, given our assumption that take-up costs are associated only with means-tested benefits. Figure 4 compares poverty and social welfare outcomes for BI/FT (the black line) and means-tested schemes in three cases: without take-up costs ( $\gamma = 1, \phi = 0$ ; the green line), with variable costs ( $\gamma = 0.5, \phi = 0$ ; the dotted line) and with fixed costs ( $\gamma = 1, \phi = 39.5$ ; the dashed line).  $\gamma = 0.5$  means that marginal utility of benefit income is half of that of earnings. (We also use  $\gamma = 0.9$  later as a sensitivity test.) The value of  $\phi$  has been chosen to be of meaningful size in comparison to utility from out-of-work income.<sup>28</sup> The withdrawal rate in all three cases is set at a moderate level ( $s = 30\%$ ) as a compromise between achieving a greater contrast with BI/FT and covering a wider range of tax rates  $t$  (given that the combined marginal tax rate,  $s + t$ , needs to be kept below 100% to retain work incentives).

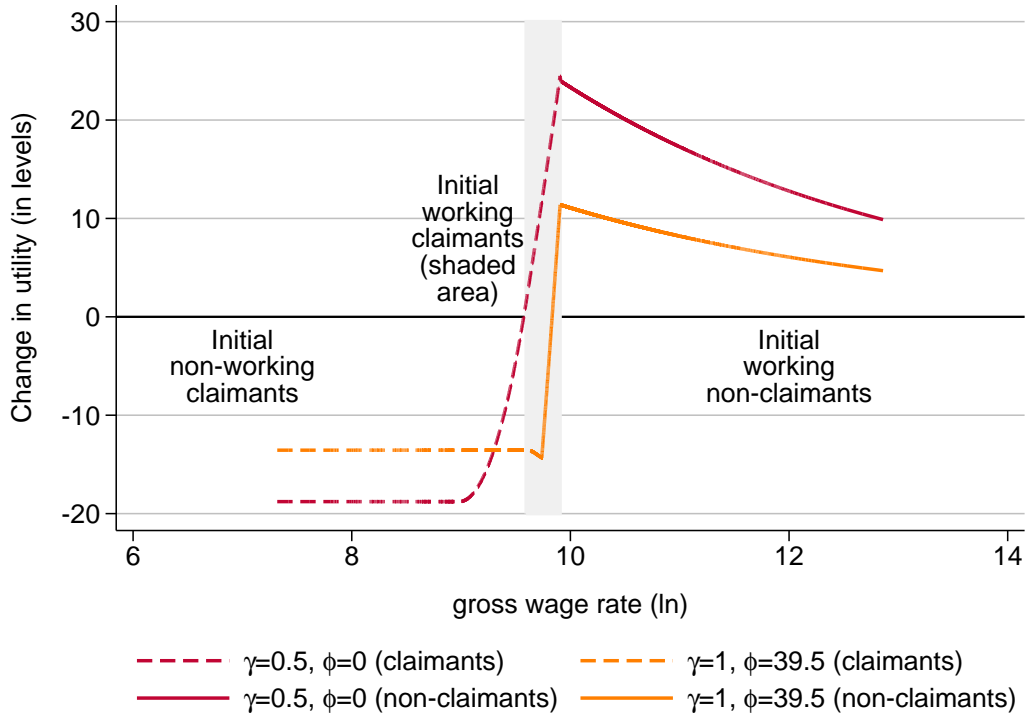
The striking result is that poverty rates for means-tested schemes are lower (or similar) and social welfare indicators (partly) higher in the presence of claiming costs. What can explain this? This is due to increased work effort in the optimum to compensate for reduced utility from means-tested support. In other words, with less value being attached to the means-tested benefit, individuals seek to maximise utility through greater reliance on work income, either by taking up work or, if already working, increasing the work intensity. As expected, fewer people claim the means-tested benefit when it involves fixed costs (see Figure 5) but the share of non-working population remains similar (until  $t$  reaches about 50%) and work contribution increases primarily at the intensive margin. The take-up of means-tested benefits among eligible working people is now partial and their proportion is highly sensitive to the tax rate, increasing in the latter. The take-up among non-working population remains 100% as long as utility from claiming exceeds the fixed costs (otherwise no inactive person would claim). Some people also drop out of work to claim a larger benefit.

In the case of variable costs, however, the number of people working and claiming the means-tested benefit *increases*. The majority of these are people who would decide not to work (and hence opt for the maximum benefit) if claiming was costless. Average work hours also increase when claiming involves variable costs (except for high  $t$  values). Out-of-work income (i.e. the maximum value of  $B$ ) is higher in absolute terms with either type of claiming costs: partial take-up under the fixed costs and a larger share of claimants working under the variable costs (which reduces

---

<sup>28</sup> $\phi = 39.5$  is derived as one third of utility attained under the BI/FT scheme (with  $t = 0.15$ ) for those only receiving the universal benefit.

Figure 6: Utility gains and losses (MT benefit withdrawal rate  $s = 30\%$ , tax rate  $t = 50\%$ )



Notes:  $N=10000$ ;  $\ln w=N(10,.5)$ ;  $\alpha=.7$ ; net revenue (per capita)=2000. Change in utility relative to when take-up incurs no costs. The shaded area shows initial working claimants, non-working claimants to the left and working non-claimants to the right.

entitlement) both allow the benefit to become more generous.

The overall positive welfare effects of take-up costs are relatively small, however, and occur only at relatively high tax rates (above 35%). There is also notable variation among the population, featuring both utility gains and losses. Figure 6 summarises utility changes when variable and fixed take-up costs are introduced (with the withdrawal rate  $s = 30\%$  and tax rate  $t = 50\%$ ). The majority of initial benefit claimants lose out (despite increases in the benefit amount) and non-claimants gain as the tax burden is reduced (for a given  $t$  through a rise in the tax-free threshold) as people work more. More specifically, all those who remain eligible for the benefit (either claiming or not) after fixed claiming costs are introduced have their utility reduced. Only some of those who increase their labour and are no longer entitled to the benefit, experience gains as the tax-free threshold increases. With variable costs, all claimants who were not working initially tend to lose. Depending on the tax rate, some of working claimants who were also working initially, may have a loss of utility too.

In comparison with the BI/FT scheme, means-tested schemes with costly take-up generate lower employment and consumption levels still. The same is true for social welfare indicators, while poverty levels can even be lower in comparison with



the BI/FT scheme, as the example with variable costs demonstrates – see FGT1 and FGT2 measures in Figure 4. The explanation lies with how poverty is measured: we follow the general practice by considering poverty in terms of disposable income with no adjustments being made for costs related to obtaining various sources of income. As discussed in Atkinson (1995a, p. 235-237), poverty measurement typically ignores disutility from working as well as the cost of claiming benefits. While the case of variable claiming costs can seemingly lead to favourable poverty outcomes, it does not reflect the costs arising from claiming. This is different from social welfare indicators, which are directly based on individual utilities and hence capture claiming costs by construction – as a result, means-tested schemes with costly take-up do not achieve higher welfare compared to the BI/FT scheme in this framework.

To achieve more comprehensive poverty measurement, one would need to determine the money-metric value of claiming costs. One obvious way is to think in terms of equivalent cash income ( $\delta$ ) which is needed to replace benefit income (in the optimum), while retaining the same level of utility, and use that instead of net income  $c_N$  to measure poverty:<sup>29</sup>

$$u(z^* + \gamma B, h^*) - \phi = u(z^* + \delta, h^*) \quad (12)$$

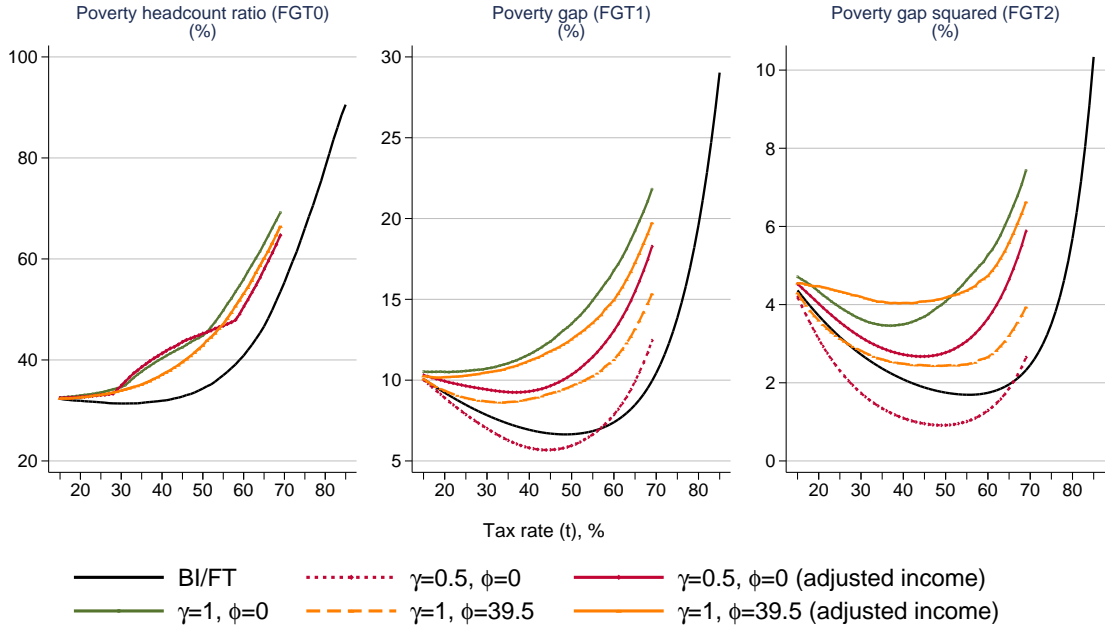
The money-metric value of claiming costs is then defined as  $\mu = B - \delta$ . In the case of variable costs only, it follows conveniently that  $\mu_V = (1 - \gamma)B$ . With fixed costs only,  $\mu_F$  depends on the values of  $z^*$  and  $h^*$ . Poverty as measured on the basis of adjusted income ( $z^* + \delta$ ) is shown in Figure 7. Due to adjusted incomes being lower than cash incomes, FGT1 and FGT2 poverty levels increase for scenarios with claiming costs, above the lines for BI/FT. In the case of fixed costs, the poverty severity (FGT2) rises even above the level of poverty when there are no claiming costs. Head-count poverty rates (FGT0) are not affected in this example as there are no people crossing the poverty line with this particular set of parameters.

We have assumed homogenous claiming costs with the same  $\gamma$  and  $\phi$  for everyone. The money-metric value of costs ( $\mu$ ), nevertheless, varies with the benefit entitlement and market income. Variable costs are defined proportional to the benefit entitlement and the latter is inversely related to earnings, hence, variable costs in absolute terms are negatively correlated with gross earnings.<sup>30</sup> This is demonstrated in Figure 8 plotting each type of claiming costs against the wage rate, for the withdrawal rate of  $s = 30\%$  and two tax rates ( $t = 25\%, 50\%$ ). It confirms

<sup>29</sup>We can also express this in terms of marginal rate of substitution:  $MRS_{zB} = \frac{\partial u}{\partial c} / (\frac{\partial u}{\partial c} - \phi)$ , where  $c = z + \gamma B$ .

<sup>30</sup>Similar to fixed costs, variable costs could reflect alternative costs such as time and effort spent on preparing and making a benefit claim. It is not obvious that these should be the same (in absolute terms) for everyone and, for example, could be higher for individuals with lower abilities.

Figure 7: Adjusted poverty measures (MT benefit withdrawal rate  $s = 30\%$ )



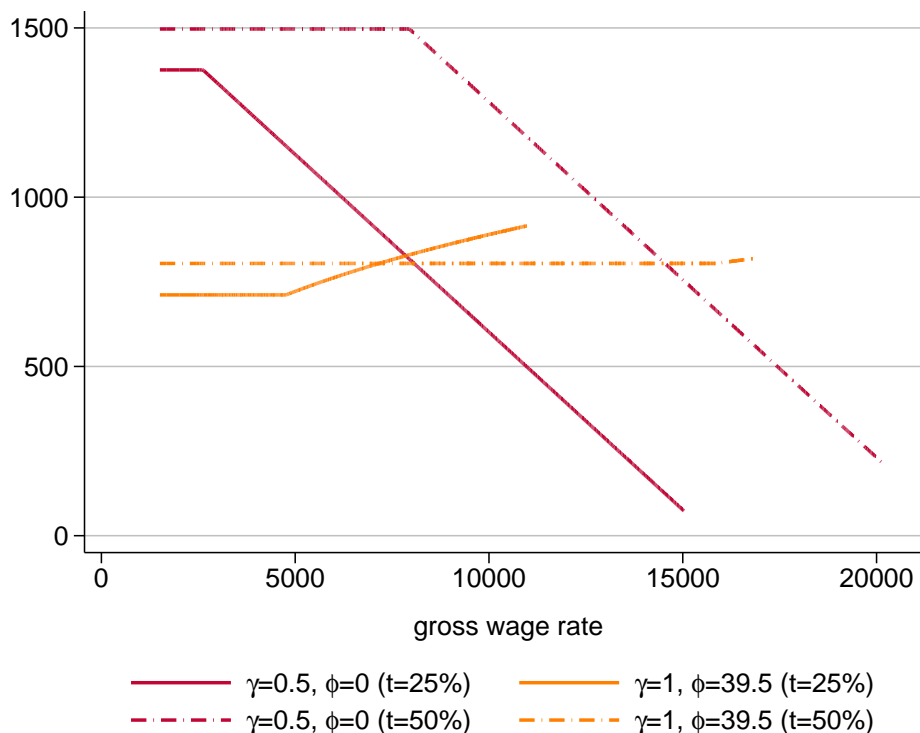
Notes: N=10000; mean/median FT gross wage=28261/21892;  $\alpha=7$ ; poverty line=10000; net revenue (per capita)=2000.

that the profile for variable costs is mostly downward sloping, though at first there is a flat part referring to the inactive population receiving the maximum benefit. Additionally, it shows that the monetary value of the fixed type of costs (fixed in utility terms) also varies with the wage rate after an initial flat region (again those not working) but now the costs are increasing in the wage rate. Such a cost pattern ‘intensifies’ means-testing further. The segment of increasing  $\mu_F$  is sensitive to the tax rate – the higher is the tax rate the more benefit recipients leave the workforce to receive the full benefit amount.

In the final step, we have carried out further sensitivity tests with alternative values of  $\gamma$  (a higher  $\gamma$  means lower variable costs) and  $\alpha$  (how much consumption is valued). First, while  $\gamma = 0.5$  helped to demonstrate the extent of variable costs which *can* lead to lower poverty rates compared with BI/FT, this case may imply unrealistically high costs. With lower variable costs ( $\gamma = 0.9$ ), the corresponding lines on the graphs shift close to the case which involves no claiming costs ( $\gamma = 1, \phi = 0$ ) and the main difference with  $\gamma = 0.5$  is that costly take-up no longer achieves lower FGT1 and FGT2 values against the BI/FT scenario. Other qualitative results hold still.

Second, we have performed simulations for  $\alpha = 0.5$  and  $\alpha = 0.8$ , and obtained very similar qualitative results overall. The main difference seems to concern the poverty profiles, which have more curvature (convexity) for higher values of  $\alpha$  (i.e.

Figure 8: Money-metric value of claiming costs (MT benefit withdrawal rate  $s = 30\%$ )



Notes: N=10000; mean/median FT gross wage=28261/21892;  $\alpha=.7$ ; poverty line=10000; net revenue (per capita)=2000.

less value attached to leisure). With  $\alpha = 0.5$ , the FGT0 plot features almost straight (upward-sloping) lines. With a higher  $\alpha$ , work incentives are less affected by taxes, hence, the same tax rate can yield more revenue and achieve lower poverty rates (using the same absolute poverty line). For the same reason, the dominance of the BI/FT scheme in terms of poverty alleviation (for FGT1 and FGT2) is reduced. However, social welfare indicators are much less sensitive to  $\alpha$  and the BI/FT scheme dominates means-tested schemes for medium and high tax rates as before. A higher  $\alpha$  leads primarily to larger relative differences between the means-tested schemes under various take-up cost assumptions.

## 5 Conclusion

Benefit means-testing has attracted more attention against the backdrop of recent fiscal consolidations and debate about the desirability of benefit means-testing continues. There is a substantial literature, which makes a strong case for means-testing from the point of view of targeting efficiency, but such a focus appears too narrow. Most of all, because of largely ignoring the impact of high effective marginal tax rates on work incentives (arising from benefit withdrawal). The optimal tax literature,

on the other hand, explicitly addresses the trade-off between equity and efficiency considerations, but remains often too abstract and generic.

The paper analyses the role of take-up costs for optimal design of transfers. Costs related to benefit claiming are often seen as another major disadvantage of means-tested benefits, contributing to their much lower observed take-up rates compared with universal benefits. We follow a simple linear tax framework of Creedy (1997) – in the spirit of optimal tax literature – and extend it with costly benefit take-up to study how this affects the optimal design of transfers under alternative value judgements (welfarist vs poverty alleviation). We consider costs in utility terms, both as variable costs proportional to the benefit entitlement as well as fixed costs.

We first carry out numeric simulations when benefit take-up has no associated utility costs, confirming the findings in Creedy (1997): for a given government's net revenue requirement, basic income outperforms means-tested benefits (both funded by a flat rate tax, effectively corresponding to a negative income tax in the latter case) in most situations, with either poverty alleviation or social welfare maximisation as the objective function. We then perform simulations for the extended model with those receiving the means-tested benefit incurring a utility cost. The main result is that take-up costs raise the level of social welfare and reduce poverty (by conventional measures) achieved with means-tested schemes. This may appear surprising at first, but essentially reflects the lower value attached to benefits inducing people to increase their work effort (either at the extensive or intensive margin) at the optimum. Means-tested schemes still mostly rank behind basic income in social welfare terms, but can lead to substantially lower poverty rates in some instances (with FGT1 and FGT2 measures). This however points to an important limitation of conventional poverty measurement, which is solely based on net incomes and ignores costs related to acquiring various incomes. When we base poverty measures on incomes adjusted for benefit claiming costs, the generally favourable position of the basic income/flat tax scheme is restored even though claiming costs can still improve poverty outcomes for means-tested schemes in some instances.<sup>31</sup> Overall, the case for means-tested benefits is not necessarily weakened when claiming costs are taken into account.

There are a number of related aspects, which our paper does not address and are left for future research. First, further practical issues like administration costs, timing of payments and accurate measurement of incomes could be explored, all presumably more problematic for means-tested benefits. Second, we have considered a partial (static) equilibrium, while taking labour demand (as well as other price

---

<sup>31</sup>Measuring the cost of benefit take-up empirically is of course a serious challenge, though a few studies have attempted this, see Duclos (1995) and Hernandez et al. (2007).

effects) into account would enrich the analysis further. There could also be important dynamic interactions over time.<sup>32</sup> Last, political economy arguments should not be underestimated. More means-testing or targeting could well imply less political support as a smaller share of population benefits from that (Korpi and Palme, 1998). Extending the same argument, Cremer and Roeder (2015) show in a simple formal framework that a likely political outcome entails generous means-testing (covering the middle class) but a fully universal system would lack the support of the majority. Furthermore, the design of transfers may in turn have important implications in other dimensions.<sup>33</sup>

---

<sup>32</sup>As Atkinson (1999, p. 8) has emphasised, a comprehensive analysis of the welfare state needs to cover ‘contingencies for which the welfare state exists’.

<sup>33</sup>For example, Blumkin et al. (2015) analyse the desirability of supporting children and find that it depends crucially on whether the support is provided on a universal basis or means-tested.

## References

- Atkinson, A. B. (1995a). *Incomes and the Welfare State: Essays on Britain and Europe*. Cambridge: Cambridge University Press.
- Atkinson, A. B. (1995b). *Public Economics in Action: The Basic Income/Flat Tax Proposal*. Oxford University Press.
- Atkinson, A. B. (1999). *The Economic Consequences of Rolling Back the Welfare State*. Munich Lectures in Economics, Cambridge, London: The MIT.
- Beckerman, W. (1979). “The impact of income maintenance payments on poverty in Britain, 1975.” *The Economic Journal*, 89(354), 261–279.
- Besley, T. (1990). “Means testing versus universal provision in poverty alleviation programmes.” *Economica*, 57(225), 119–129.
- Besley, T., and Coate, S. (1995). “The design of income maintenance programmes.” *The Review of Economic Studies*, 62(2), 187–221.
- Beveridge, W. (1942). *Social Insurance and Allied Services*. London: H.M. Stationery Office.
- Blumkin, T., Margalioth, Y., and Sadka, E. (2015). “The re-distributive role of child benefits revisited.” *International Tax and Public Finance*, 22(3), 476–501.
- Boadway, R. (2012). *From Optimal Tax Theory to Tax Policy: Retrospective and ProProspect Views*. Munich Lectures in Economics, Cambridge: The MIT Press.
- Brett, C. (1998). “Who should be on workfare? The use of work requirements as part of an optimal tax mix.” *Oxford Economic Papers*, 50(4), 607–622.
- Brewer, M., Saez, E., and Shephard, A. (2010). “Means-testing and tax rates on earnings.” In J. Mirrlees, S. Adam, T. Besley, R. Blundell, S. Bond, R. Chote, M. Gammie, P. Johnson, G. Myles, and J. Poterba (Eds.), *Dimensions of Tax Design: The Mirrlees Review*, chap. 2, 90–173, Oxford: Oxford University Press.
- Creedy, J. (1996). “Comparing tax and transfer systems: Poverty, inequality and target efficiency.” *Economica*, 63(250), S163–S174.
- Creedy, J. (1997). “Evaluating alternative tax and transfer schemes with endogenous earnings.” *Oxford Economic Papers*, 49(1), 43–56.
- Creedy, J. (1998). “Means-tested versus universal transfers: Alternative models and value judgements.” *The Manchester School*, 66(1), 100–117.

- Cremer, H., and Roeder, K. (2015). “Means testing versus basic income: The (lack of) political support for a universal allowance.” *Economics Letters*, 136, 81–84.
- Cuff, K. (2000). “Optimality of workfare with heterogeneous preferences.” *The Canadian Journal of Economics / Revue canadienne d’Economie*, 33(1), 149–174.
- Currie, J. (2004). “The take up of social benefits.” NBER Working Paper 10488.
- Diamond, P., and Saez, E. (2011). “The case for a progressive tax: From basic research to policy recommendations.” *The Journal of Economic Perspectives*, 25(4), 165–190.
- Diamond, P. A. (1998). “Optimal income taxation: An example with a U-shaped pattern of optimal marginal tax rates.” *The American Economic Review*, 88(1), 83–95.
- Duclos, J.-Y. (1995). “Modelling the take-up of state support.” *Journal of Public Economics*, 58(3), 391 – 415.
- Ebert, U. (2005). “Optimal anti-poverty programmes: Horizontal equity and the paradox of targeting.” *Economica*, 72(287), 453–468.
- Hernandez, M., Pudney, S., and Hancock, R. (2007). “The welfare cost of means-testing: pensioner participation in Income Support.” *Journal of Applied Econometrics*, 22(3), 581–598.
- Hernanz, V., Malherbet, F., and Pellizzari, M. (2004). “Take-up of welfare benefits in OECD countries: A review of the evidence.” Social, Employment and Migration Working Papers 17, OECD, Paris.
- Hsu, M., and Yang, C. (2013). “Optimal linear and two-bracket income taxes with idiosyncratic earnings risk.” *Journal of Public Economics*, 105, 58 – 71.
- Immervoll, H., Kleven, H. J., Kreiner, C. T., and Saez, E. (2007). “Welfare reform in European countries: a microsimulation analysis.” *The Economic Journal*, 117(516), 1–44.
- Kanbur, R., Jukka, P., and Tuomala, M. (2006). “Non-welfarist optimal taxation and behavioural public economics.” *Journal of Economic Surveys*, 20(5), 849 – 868.
- Kanbur, R., Keen, M., and Tuomala, M. (1994). “Optimal non-linear income taxation for the alleviation of income-poverty.” *European Economic Review*, 38(8), 1613 – 1632.

- Kanbur, R., and Tuomala, M. (1994). “Inherent inequality and the optimal graduation of marginal tax rates.” *The Scandinavian Journal of Economics*, 96(2), 275–282.
- Kaplow, L. (2007). “Optimal income transfers.” *International Tax and Public Finance*, 14(3), 295–325.
- Keane, M. P., and Moffitt, R. (1998). “A structural model of multiple welfare program participation and labor supply.” *International Economic Review*, 39(3), 553–589.
- Keen, M. (1992). “Needs and targeting.” *The Economic Journal*, 102(410), 67–79.
- Kesselman, J. R., and Garfinkel, I. (1978). “Professor Friedman, meet Lady Rhys-Williams: NIT vs. CIT.” *Journal of Public Economics*, 10(2), 179 – 216.
- Kleven, H. J., and Kopczuk, W. (2011). “Transfer program complexity and the take-up of social benefits.” *American Economic Journal: Economic Policy*, 3(1), 54–90.
- Korpi, W., and Palme, J. (1998). “The paradox of redistribution and strategies of equality: Welfare state institutions, inequality, and poverty in the Western countries.” *American Sociological Review*, 63(5), 661–687.
- Lambert, P. J. (1990). “The equity-efficiency trade-off: Breit reconsidered.” *Oxford Economic Papers*, 42(1), 91–104.
- Mankiw, N. G., Weinzierl, M., and Yagan, D. (2009). “Optimal taxation in theory and practice.” *The Journal of Economic Perspectives*, 23(4), 147–174.
- Mirrlees, J. (1971). “An exploration in the theory of optimum income taxation.” *Review of Economic Studies*, 38(114), 175.
- Mirrlees, J., Adam, S., Besley, T., Blundell, R., Bond, S., Chote, R., Gammie, M., Johnson, P., Myles, G., and Poterba, J. (Eds.) (2010). *Dimensions of Tax Design: The Mirrlees Review*. Oxford: Oxford University Press.
- Moffitt, R. (1983). “An economic model of welfare stigma.” *The American Economic Review*, 73(5), 1023–1035.
- Moffitt, R. (1992). “Incentive effects of the U.S. welfare system: A review.” *Journal of Economic Literature*, 30(1), 1–61.
- Moffitt, R. (2003). “The Negative Income Tax and the evolution of U.S. welfare policy.” *The Journal of Economic Perspectives*, 17(3), 119–140.



- Moffitt, R. (2006). “Welfare work requirements with paternalistic government preferences.” *The Economic Journal*, 116(515), F441–F458.
- Piketty, T., and Saez, E. (2013). “Optimal labor income taxation.” In A. J. Auerbach, R. Chetty, M. Feldstein, and E. Saez (Eds.), *Handbook of Public Economics*, *Handbook of Public Economics*, vol. 5, chap. 7, 391 – 474, Amsterdam: Elsevier.
- Pudney, S., Hancock, R., and Sutherland, H. (2006). “Simulating the reform of means-tested benefits with endogenous take-up and claim costs.” *Oxford Bulletin of Economics and Statistics*, 68(2), 135–166.
- Rothstein, J. (2010). “Is the EITC as good as an NIT? Conditional cash transfers and tax incidence.” *American Economic Journal: Economic Policy*, 2(1), 177–208.
- Saez, E. (2001). “Using elasticities to derive optimal income tax rates.” *The Review of Economic Studies*, 68(1), 205–229.
- Saez, E. (2002). “Optimal income transfer programs: Intensive versus extensive labor supply responses.” *Quarterly Journal of Economics*, 117(3), 1039 – 1073.
- Slemrod, J., Yitzhaki, S., Mayshar, J., and Lundholm, M. (1994). “The optimal two-bracket linear income tax.” *Journal of Public Economics*, 53(2), 269–290.
- Strawczynski, M. (1998). “Social insurance and the optimum piecewise linear income tax.” *Journal of Public Economics*, 69(3), 371 – 388.
- Thompson, B. (2012). “Flat rate taxes and relative poverty measurement.” *Social Choice & Welfare*, 38(3), 543 – 551.
- Tondani, D. (2009). “Universal Basic Income and Negative Income Tax: Two different ways of thinking redistribution.” *The Journal of Socio-Economics*, 38(2), 246 – 255.
- Tuomala, M. (1990). *Optimal income tax and redistribution*. Oxford: Clarendon Press.

## **ImPRovE: Poverty Reduction in Europe. Social Policy and Innovation**

Poverty Reduction in Europe: Social Policy and Innovation (ImPRovE) is an international research project that brings together ten outstanding research institutes and a broad network of researchers in a concerted effort to study poverty, social policy and social innovation in Europe. The ImPRovE project aims to improve the basis for evidence-based policy making in Europe, both in the short and in the long term. In the short term, this is done by carrying out research that is directly relevant for policymakers. At the same time however, ImPRovE invests in improving the long-term capacity for evidence-based policy making by upgrading the available research infrastructure, by combining both applied and fundamental research, and by optimising the information flow of research results to relevant policy makers and the civil society at large.

The two central questions driving the ImPRovE project are:

How can social cohesion be achieved in Europe?

How can social innovation complement, reinforce and modify macro-level policies and vice versa?

The project runs from March 2012 till February 2016 and receives EU research support to the amount of Euro 2.7 million under the 7<sup>th</sup> Framework Programme. The output of ImPRovE will include over 55 research papers, about 16 policy briefs and at least 3 scientific books. The ImPRovE Consortium will organise two international conferences (Spring 2014 and Winter 2015). In addition, ImPRovE will develop a new database of local projects of social innovation in Europe, cross-national comparable reference budgets for 6 countries (Belgium, Finland, Greece, Hungary, Italy and Spain) and will strongly expand the available policy scenarios in the European microsimulation model EUROMOD.

More detailed information is available on the website <http://improve-research.eu>.

Bea Cantillon (Coordinator)

E-mail: [bea.cantillon@uantwerpen.be](mailto:bea.cantillon@uantwerpen.be)

Phone: +32 3 265 53 98

Address: University of Antwerp – Sint-Jacobstraat 2 (M.177) – 2000 Antwerp - Belgium

Tim Goedemé (Manager)

E-mail: [tim.goedeme@uantwerpen.be](mailto:tim.goedeme@uantwerpen.be)

Phone: +32 3 265 55 55

Mobile: +32 494 82 36 27

Address: University of Antwerp – Sint-Jacobstraat 2 (M.185) – 2000 Antwerp - Belgium