

BASIC INCOME VERSUS WAGE SUBSIDIES: COMPETING INSTRUMENTS IN AN OPTIMAL TAX MODEL WITH A MAXIMIN OBJECTIVE

ROBERT VAN DER VEEN

University of Amsterdam, Amsterdam School for Social Research

This article challenges the general thesis that an unconditional basic income, set at the highest sustainable level, is required for maximizing the income-leisure opportunities of the least advantaged, when income varies according to the responsible factor of labor input. In a linear optimal taxation model (of a type suggested by Vandenbroucke 2001) in which opportunities depend only on individual productivity, adding the instrument of a uniform wage subsidy generates an array of undominated policies besides the basic income maximizing policy, including a “zero basic income” policy which equalizes the post-tax wage rate. The choice among such undominated policies may be guided by distinct normative criteria which supplement the maximin objective in various ways. It is shown that most of these criteria will be compatible with, or actually select, the zero basic income policy and reject the basic income maximizing one. In view of the model’s limited realism, the force of this main conclusion is discussed both in relation to Van Parijs’ argument for basic income in *Real Freedom for All* (1995) and to some key empirical conditions in the real world.

I am grateful for useful comments on various stages of this paper by Marc Fleurbaey, Susan Hurley, Mathias Hild, Dirk Van de gaer, Frank Vandenbroucke, Alex Voorhoeve, Roland van der Veen, Andrew Williams, Chris Woodard and an anonymous referee. Above all I thank Loek Groot for his contribution. The research has also been supported by the Netherlands Organization for Scientific Research (NWO), and the Social and Political Theory Program of the Research School of Social Sciences, Australian National University.

1.1. INTRODUCTION

This paper compares normative arguments for adopting either an unconditional and equal basic income as the policy instrument of a responsibility-sensitive maximin objective or a uniform subsidy on market wage rates. To study this issue, a variant of the model in Vandembroucke (2001) is used. This model extends the theory of linear optimal taxation, which studies the impact of redistribution when productivities are unequal, preferences for income and leisure are diverse, and income is taxed proportionally. In the usual format of the theory, tax revenue is redistributed as a uniform lump-sum transfer – a basic income.¹ Vandembroucke's extension assumes that the government is able to observe the labor inputs of individuals and can use this information to redistribute tax revenue in proportion to the hours of work actually performed.

Adding this instrument of the wage subsidy alters the incentive structure and thereby allows for different optimal tax rates associated with different possible mixes of basic income and wage subsidy levels. In linear optimal tax models, the basic income instrument creates disincentives to supply labor. These limit the extent to which tax-financed redistribution can improve the situation of the worst off, since revenue depends on the total volume of labor supplied. The wage subsidy instrument, however, creates a positive incentive to earn for the beneficiaries of redistribution – these being the low wage earners, whose productivity is correspondingly low. The incentive arises because for low wage earners, a uniform wage subsidy adds more to income per hour than is taxed away in order to finance the subsidy; in other words it increases their net rate of reward. As a result, low wage earners will supply more labor than they would do at the same rate of income tax under a basic income, and without the subsidy.²

The significance of this is as follows. Suppose individuals are held responsible for their preferences to earn or consume free time but not for their fixed maximum productivity. The government's objective is to maximize the income-leisure opportunities of the lowest wage earners, having identified these as being worst off, due to the non-responsible factor of productivity. In the absence of expenditure on things like education and defense, one can envisage two opposed optimal policies. In the first, basic income is the only instrument. Then the lowest wage earners benefit most from setting basic income at its maximum sustainable level, at a tax rate of, say, 50%. The second policy exclusively uses wage subsidies. Now the lowest wage earners benefit most at a tax rate of 100%. Because maximum productivity of individuals is fixed and the wage subsidy incites low wage

¹ In these models, basic income is often a stand-in for the per capita amount of real world transfers, which may be either in kind or in cash and conditional or unconditional. Here basic income is meant to be a fully unconditional cash transfer.

² At least, this is so if the income effect of the higher net reward is smaller than the substitution effect, as is usually found to be the case.

earners to earn more, all wage income can be taxed away if everyone is granted a subsidy at the average productivity. Since both of these policies are sustainable ways of conferring maximal benefit on the lowest wage earners, there will exist a wide range of intermediate tax-redistribution policies which satisfies the government's objective. Each of those policies is characterized by a unique mix of basic income and wage subsidies.

The existence of this large array of policies is a consequence of taking an individual budget set of income-leisure opportunities (OS in short) as the metric of well-being for purposes of responsibility-sensitive justice. The OS metric is very general. It only assumes that well-being is increasing in disposable income and leisure and therefore depends on a dominance rule for ranking individual budget sets. As a result, the income-leisure opportunities conferred by the budget sets of the least productive individuals under any two feasible policies may be mutually undominated. Since the objective of maximizing the minimum of individual opportunities selects undominated feasible policies, several of these policies exist.

In section 2, I discuss various ways of interpreting the OS metric and raise the possibility of specifying it, namely by using utility information. Then, following Vandembroucke's method of exposition, the undominated policies are derived for two alternative regimes T and S. In regime T, information on labor inputs of individuals is absent, and basic income is the only available instrument. Under plausible empirical conditions, maximin OS requires the tax rate to be close to the revenue-maximizing one, with the largest basic income. In part, this supports the general claim that maximizing basic income is optimal from the point of view of "leximin real freedom" (van der Veen 1991: ch. 3; 1997). But that claim loses much of its support in regime S, in which the two competing instruments are available, and undominated policies consistent with high tax rates exist. In particular the "zero basic income policy", with the tax rate at unity and wage subsidies at average productivity, has an intuitive appeal which is hard to ignore, if only because it equalizes the budget sets of all individuals. Thus the optimal tax model of regime S fundamentally challenges the thesis that dispensing the highest sustainable unconditional income is uniquely justified by a liberal egalitarian ideal which incorporates considerations of efficiency and individual freedom.

Section 3 studies the nature of this challenge in detail. Its strategy is to assume agreement on the objective of maximin OS that underlies the undominated policies of regime S, each policy with its own mix of basic income and wage subsidies. The selection among those policies may then be guided by various supplementary, and possibly controversial, normative criteria. I discuss two kinds: adjudication and compensation criteria. The point of this distinction is that the set of undominated policies can be narrowed down in two logically opposite ways. The adjudication approach to policy selection studies principles defining a fair balance

between the competing interests of persons in the same productivity class who choose to act from different income-leisure preferences. Alternatively, the compensation approach focuses on principles for adjusting the budget sets of individuals of different productivity consistently with the maximin rule of compensation and regardless of differences in preference. Of course several possible normative viewpoints exist within each of these two approaches. My list of adjudication and compensation criteria is not meant to be exhaustive. But it helps to identify several important considerations in debates between political philosophers concerning the most defensible specification of the liberal egalitarian ideal. I then show that on most selection criteria the basic income-maximizing policy will be rejected in favour of the zero basic income alternative. The conclusions in this part of the paper may contribute to a better understanding of what is at stake in the political theory of basic income.³

In view of the model's obvious limitations, section 4 discusses the relevance of these conclusions. I start by examining the most influential version of the basic income maximizing argument, due to Van Parijs (1995). This argument holds that the legitimate tax base for financing basic income consists of unequal external endowments rather than the unequal internal endowment of productivity. I show that this argument, too, becomes inconclusive in the presence of the wage subsidy instrument. Then I ask how the policy choice between basic income and wage subsidies under the maximin objective is affected in a more realistic setting. First, the model ignores the incentive effects of income redistribution on human capital. The advantage of wage subsidies over basic income in respect of labor supply may be largely offset by a disadvantage in generating the investment necessary for developing productivity. This is because subsidizing wage rates reduces incentives from net reward differentials more than basic income does at the same tax rate. Second, once productivity ceases to be a fully non-responsible characteristic of individuals, the maximin objective becomes more difficult to operationalize. The just rate of redistribution may have to be adjusted, depending on how important backward-looking considerations of individual responsibility are taken to be. And finally, the benchmark against which to assess the impact of basic income or wage subsidizing policies is the conditional subsistence guarantee of the welfare state. Considering these three features of the real world, I conclude that if subsistence can be guaranteed unconditionally rather than by subsidizing the work of the least advantaged segment of the population, this may well be the more defensible policy.

1.2. THE MODEL

Each person is characterized by a productivity coefficient w ($0 < w \leq 1$) and a preference coefficient e ($0 < e \leq 1$). All are able to work one standard

³ The main literature on this topic is reviewed in Van der Veen (1998).

unit of time and are free to choose any fraction L of it, giving wL in wage earnings. The coefficients w and e respectively express the human endowment (maximum earning potential) and the propensity to trade earnings against leisure: the more someone prefers income from work compared to free time, the higher e will be. The government holds persons responsible for their preferences but not for their productivity. This rigid separation of responsibility is questionable whenever e and w are causally connected. It is assumed, however, that the two are distributed independently.

Under the maximin objective of responsibility-sensitive justice, government redistributes income in favor of those who are worst off in well-being as a result of their productivity level. Well-being is assumed to depend only on income and free time. The objective is defined in section 2, after the metric of well-being has been discussed. Depending on the available information, different tax-and transfer policies are considered. Following Vandenbroucke (2001), two types of “second-best” policy environments are distinguished, regime T and regime S. Regime T is the one usually assumed in linear optimal taxation theory. The government knows the distributions of e and w , as well as the general form of the utility function (see below). It can observe the income of individuals but not the amounts of time they spend in earning it. Income is taxed at a uniform rate t , and revenue is distributed as a uniform unconditional basic income B under a balanced budget constraint. In regime T, each feasible policy is described by a different pair of instrument values (B, t) . In regime S, incomes and labor inputs of individuals can both be observed. Then the government has a choice between two instruments for redistributing tax revenue: either basic income or a uniform wage subsidy s in return for each hour of work performed. Subject to the balanced budget constraint, each feasible policy of regime S has unique instrument values (B, s, t) . To determine the feasible policies, the individual budget constraint is defined:

$$Y = B + [w(1 - t) + s]L \quad w \in [w_L, 1]; w_L > 0$$

$$(1) \quad L \in [0, 1]; \quad 0 \leq t \leq 1; \quad 0 \leq s \leq t,$$

with w_L denoting the lowest productivity. Net income (Y) is unconditional basic income B plus income from work, which itself consists of net wages $w(1 - t)L$ and subsidies sL . The rate of net reward is defined as $w(1 - t) + s$. Utility is maximized subject to (1). The utility function is additive, linear in income but not in leisure:

$$(2) \quad U_e(Y, L) = Y - \frac{L^2}{2e} \quad e \in [e_L, 1], e_L \geq 0$$

with e_L the preference coefficient of the most-work-averse individual. Utility is interpreted ordinally by an indifference map. The marginal rate of substitution between labor and income is $-L/e$, implying that indifference

curves of persons with different e cross once. From (1) and (2), the utility-maximizing labor supply L^S is derived:

$$(3) \quad L^S(w, e, t, s) = e[w(1 - t) + s].$$

As Equation (3) shows, the work incentive resulting from the government's choice of (s, t) is the net reward, which individuals respond to in proportion to their preference coefficient.⁴ Changes in labor supply are due only to substitution effects, and elasticity with respect to net reward is at unity.⁵ From (1), (2) and (3), one obtains the indirect utility function V_e . The income-leisure preferences of an utility-maximizing individual with given productivity and preferences under a given policy are described by any strict monotonic transformation of $V_e(w, e, t, s, B)$ in Equation (4):⁶

$$(4) \quad V_e(w, e, t, s, B) = 1/2e(w(1 - t) + s)^2 + B.$$

⁴ Setting the upper limits of w and e at unity, and the lower limit of t at zero in (1) and (2) implies that $L^S \leq 1$ in (3). This constraint is imposed deliberately, in order to simplify the model's balanced budget equation (5). But it should be noted from (2) that restricting e to $[0,1]$ arbitrarily rules out some income-leisure preferences that can not be considered excessively workaholic. However, this restriction does not affect the conclusions of the paper with regard to the relative merits of the instruments s and B .

⁵ This is due to the specification of Equation (2), which may have been chosen in Vandembroucke's model for purposes of expositional simplicity. Note that as a result, Equation (3) overstates the responsiveness of labor supply to net reward, in comparison with both male and female elasticities found in most empirical studies. In Schokkaert, Van de gaer and Vandembroucke (2001), the utility function is generalized to a class generating supply functions with different constant elasticities in a model without wage subsidies.

⁶ The ordinal and non-comparable interpretation of the utility functions (2) and (4) may be considered too restrictive. One might think that the utility of persons with different preference coefficients can be compared, under a cardinal interpretation of (2) and (4). But this raises a problem. Since V is then increasing in e and w , it follows that if two individuals with the same productivity and different preferences are subject to the same policy, the one with the higher e will achieve proportionally more utility than the other. This undermines the plausibility of assigning responsibility to individual preferences, by the following argument. One may hold that people are responsible for their choices if their preferences and actions are under their own control, so that they are free to pursue other choices if they feel this would better serve their interests. To apply this "control" conception of responsibility, the utility-maximizing agents in the model must be free to vary their preference coefficients. But if utility is increasing in e , then such agents will choose $e = 1$, in contradiction with the basic assumption that preferences are diverse; see also Schokkaert, Van de gaer and Vandembroucke (2001: 6). On an alternative view, people may be held responsible for acting upon their preferences, provided that they endorse those preferences on reflection, regardless of whether or not they are free to vary them. On this "endorsement" conception of responsibility, one need not suppose that e is under people's control. However, the endorsement conception does not generally support responsibility for labor choices if preference coefficients are inflexible and utility is cardinalized. For example, someone who is work-averse will not endorse his preferences on reflection, given that utility is the only thing that matters and is increasing in e . So if utility is made interpersonally comparable in the way described, a dilemma arises. If people are in control of their preferences, then they can be held responsible for acting upon them, on both of the above conceptions. But in this case the diversity of preferences will be eliminated. If people are not in control of their preferences, diversity can be preserved. But then the agents can not all be held responsible for their choices on either of the two conceptions of responsibility. This dilemma does not

The indirect utility function implies that utility increases with the productivity at which someone actually decides to work. Hence agents have an incentive to work at their maximum productivity w .⁷ The feasible policies are determined by the balanced budget constraint, which requires that tax revenues equal transfers:

$$\int_{w_L}^1 \int_{e_L}^1 twL^s f_{we}(w, e) de d\tau w = B + \int_{w_L}^1 \int_{e_L}^1 sL^s f_{we}(w, e) de dw.$$

In this accounting equation, the left-hand side represents per capita tax revenues, with $f_{we}(w, e)$ the joint density function of the distributions of w and e . The right-hand side gives per capita transfers: basic income B and the average amount of revenue distributed as wage subsidy at the rate s . Because $L^s \leq 1$ and is the product of e and net reward $w(1 - t) + s$, from (3), and because w and e are independently distributed, the accounting equation can be transformed into the following equation of the balanced budget constraint:

$$(5) \quad B(w, e, t, s) = \bar{e}[t(1 - t)(\sigma_w^2 + \bar{w}^2) + (2t - 1)\bar{w}s - s^2],$$

where σ_w^2 is the variance of the wage distribution and the symbols with bars denote average values of e and w . Equation (5) incorporates the incentive effects of taxation and transfer on productivity and labor supply into the balanced budget constraint. It excludes combinations (B, s, t) which, taking those incentive effects into account, are infeasible. Since the tax rate ranges between zero and unity and the subsidy can not exceed the tax rate, basic income can be positive, zero or negative.

2.1. THE OPPORTUNITY METRIC

The model assumes that persons only care about income and free time, which they trade off against one another in different ways. This ignores that one may prefer a job offering attractive work even if the job is rewarded at a lower rate of return than one is able to earn. Given this simplification,

arise on the ordinal interpretation of utility. It is also avoided by assuming that interpersonal comparisons of utility only hold between people with the same e .

⁷ For $t < 1$, more productive work yields a higher net wage income, hence an improved budget. If the population is large but finite, there is a (very weak) incentive to increase one's productivity when $t = 1$, in regime S. For even if no one else does, there is a tiny benefit from working more productively, because this increases average productivity and so raises the subsidy or basic income available to all. See also Bensaïd and Fleurbaey (1993: 18). Note the following complication. If all work at maximum productivity while the government knows the general shape of the utility function and can observe individual labor input, then it can calculate individual preference coefficients e . This information could be used to pursue "first-best" lump sum tax and transfer policies. I do not explore such policies here.

the income-leisure opportunity set (henceforth OS) associated with a person's budget constraint can be taken as the metric of well-being. The OS is given by the combinations $[Y, (1 - L)]$ of Equation (1). Its boundary elements are income at full leisure $[B, 1]$, at $L = 0$, and fulltime income $[(B + w(1 - t) + s), 0]$, at $L = 1$. The OS is the most general metric, specifying only that well-being increases with the all-purpose means of income and free time. It is capable of being refined in alternative ways, each of which may reflect controversial judgments concerning income-leisure trade-off ratios. In particular, since the OS generally depends on productivity but not on the preference coefficient, the metric is sensitive only to variations in the non-responsible factor of individuals.

These advantages of the OS metric come at the price of limited comparability. To clarify, consider the possible comparisons of the budget sets of persons i and j : (a) either OS_i dominates OS_j or vice versa (that is to say, one of these persons enjoys more income at some amounts of leisure and at least as much income at all other amounts of leisure); (b) OS_i and OS_j are identical; (c) OS_i and OS_j are not identical and mutually undominated. This last case implies that the budget sets of i and j cross for at least one value of $L \in (0,1)$. From Equation (1), budget sets are linear, so there is only one such crossing point. The OS metric allows well-being of i and j to be ordinally ranked by the relation "at least as much well-being as" in cases (a) and (b), while in case (c) well-being of i and j is incomparable. Fortunately, this last case is ruled out when people are subject to one and the same policy in regimes T or S. If i and j are subject to a given policy (B, s, t) , then from Equation (1) we have case (b) when $t = 1$. Since all income is taxed away, individual productivity no longer determines the budget set, hence everyone is equally well off. And when $t < 1$, case (a) obtains between unequally productive persons. Then the OS of the least productive class is dominated by the OS of all other classes, hence the least productive class is worst off.

The difficulty presented by case (c) shows up once we try to assess how different policies affect the well-being of equally productive persons. Suppose i and j have the same productivity, and each is subject to a different policy. Now case (b) is ruled out by Equation (1). Depending on the values of (B, s, t) in each of the two policies, either of cases (a) or (c) is possible. Case (c) obtains whenever the budget sets cross. For example, i may then have a larger fulltime income than j but less income at full leisure. As a convenient shorthand one can say that in case (a), one policy dominates the other for a given class of equally productive persons, while in case (c), the two policies are mutually undominated for that class. In the latter case, then, the well-being of individuals in the same productivity class cannot be compared across the two policies. Moreover, one person will likewise be unable to compare his own income-leisure opportunities under two mutually undominated policies.

In view of this difficulty, one could simply accept that the income-leisure opportunity set is valued by its subjectively best element.⁸ Individuals can rank the different OS under any two policies by comparing the points $[Y, (1 - L)]$ in their budget set at which they maximize utility. So the problem of limited comparability is less serious if one accepts that utility is the relevant metric of well-being for purposes of responsibility-sensitive justice. In many cases it does indeed make sense to assume that the OS is valued only for the utility it enables a person to achieve and that such valuations are relevant for purposes of justice. Yet there are two reasons for sticking to the general format of the OS metric. First, when income and leisure are traded off differently, as in the model, the government has to make controversial judgments if it uses utility information to select between undominated policies. For example, interpersonal comparisons between persons with different preference coefficients are problematic when responsibility attaches to preferences, as is argued in footnote 6. Second, preferences change over time. In anticipation of such changes, or even on merely imagining that one may want to trade off income and leisure differently at some later stage, one may subjectively value the OS independently of its currently best element. A radical case of this “flexibility” approach is the metric of *real freedom*, defined as the set of available choices a person might want to make, with no restrictions on the preferences that the person might have.⁹ Consistently with the flexibility approach, the incomparability problem may be addressed by imposing a preference-independent rule for ranking crossing budget sets. This possibility of refining the OS metric will be explored later.

For these two reasons, the OS is here regarded as the metric of well-being for purposes of responsibility-sensitive justice. Because of the incomparability problem, the objective of maximizing the OS of the worst off generates a host of undominated policies in regimes T and S. A government which accepts the objective may then invoke any of several additional criteria for selecting among those undominated policies, and it will have to provide explicit arguments in support of its decision. Some criteria require the use of utility information, while others do not, as will be seen in section 3.

⁸ Sen (1993) calls this the comprehensive evaluation of the freedom afforded by an opportunity set. But it can just as well be regarded as the utility evaluation of that set’s conduciveness to well-being.

⁹ The flexibility approach is due to Kreps (1979). The real freedom metric was first proposed in Van Parijs (1987). See Van Parijs (1995: ch. 2) and Van der Veen (1991: chs. 2–3; 1997) for further discussions.

2.2. THE MAXIMIN OS OBJECTIVE

The government's objective is to maximize the OS of the worst-off individuals, those with the lowest productivity w_L . In Equation (6), the budget constraint of the least productive person (Y_L) is written as a function of labor input L . This variable is treated as a loose parameter ($0 \leq L \leq 1$).

$$(6) \max_{t,s} Y_L(L|B, t, s) = B + [w_L(1-t) + s]L, \text{ subject to (5).}$$

Maximizing Y_L for a given value of L selects exactly one policy (B, s, t) at which a least productive person, who conceivably might want to perform exactly that amount of labor, would earn the highest possible income. Since there is no other policy that would yield a higher income at the given value of L , the OS determined by maximizing Y_L for this value must be undominated. Thus the policies identified by the objective are undominated ones only, that is, policies which generate an undominated OS for the least productive class. It follows that the budget sets of the least productive under any two such policies must cross. In terms of the OS metric, then, the well-being of the least productive can not be compared across undominated policies.

The parameter L must be distinguished from the utility-maximizing labor supply L^S . By setting the two equal in (6), a utility-based specification of the objective is obtained. This is illustrated by the concept of a "reference preference" (Fleurbaey 1998). Here the reference preference is the preference coefficient \hat{e} of the least productive who figures as reference agent and whose indirect utility $V_{\hat{e}}$ is to be maximized by the choice of some policy, which must be an undominated one. To optimize for the reference preference, the government must choose the policy for which $L = L^S = \hat{e}[(1-t)w_L + s]$. While any policy that fixes on a possible reference preference \hat{e} belongs to the set of undominated policies identified by (6), it may be that some values of L do not support any reference preference, given the restriction of e to values in $[0,1]$.

2.3. UNDOMINATED POLICIES IN REGIME T

The values (B, s, t) of undominated policies in regimes T and S are obtained by substituting the balanced budget constraint (5) in the objective (6). This determines the optimal tax rate and wage subsidy for any value of L . Optimal basic income is then solved from (5). As a first step, the optimal tax rate is written as a function of L for any given value of the wage subsidy:

$$(7) t(L, s) = \frac{\bar{e}p - w_L L}{2\bar{e}p} + \frac{\bar{w}}{p}s, \text{ where } p = \bar{w}^2 + \sigma_w^2.$$

In this subsection I only discuss regime T. This involves setting $s=0$ in equation (7). The purpose is to make an empirical observation

concerning the claim that when the subsidy instrument is unavailable, the objective requires the highest feasible basic income. This is correct only if the lowest productivity w_L has a very low absolute value. From (7), the optimal tax rate depends on L , and for $L = 0$, $t(L) = 1/2$. This is the revenue-maximizing tax rate, denoted by t^* .¹⁰ For $L = 1$, the optimal tax rate t^{**} is minimal. The size of the difference between the largest and smallest optimal tax rates depends on parameter values. From (7), $t^{**} = 1/2 - [w_L/(2\bar{e}p)]$, hence $0 \leq t^{**} < t^* = 1/2$, for $0 < w_L \leq \bar{e}p$. Thus as the lowest productivity approaches zero, t^{**} converges on t^* . The undominated policies of regime T are then restricted to an arbitrarily small interval below the revenue-maximizing policy (t^* , B^*). This stands to reason, for if w_L were zero, the least advantaged would be entirely dependent on the unconditional income transfer. So it is not surprising that the government is instructed to maximize B at very low values of w_L , even if it chooses $L = 1$. By contrast, if w_L equals or exceeds $\bar{e}p$, then $t^{**} = 0$ and the no-redistribution policy $(0, 0)$ is undominated. For then the income that someone with the lowest productivity can earn by working fulltime at a zero tax rate will be larger than it would be under any policy with a positive tax rate. This makes “no redistribution” an undominated policy. Under those conditions, the government is not forced to redistribute income, since it is free to choose $L = 1$. The claim that maximin justice requires the highest feasible basic income in regime T thus depends on empirical conditions. But these conditions often obtain, as may be illustrated numerically.

Consider $w_L = .05$, $\bar{w} = .4$, $\sigma_w^2 = .09$ (hence $p = .25$), and $\bar{e} = .75$. These values represent realistic features of a real economy in which the redistribution problem arises: low earners are more numerous than high ones ($\bar{w} < 1/2$), and the highest productivity ($w = 1$) is twenty times as large as the lowest, thus driving down w_L to .05. There is also a high average preference coefficient, perhaps reflecting a work ethic. In such an economy, the claim concerning maximum basic income is fairly accurate. Figure 1 pictures the budget sets of the policies with $t^* = .5$ and $t^{**} = .3667$, showing the respective fulltime incomes ($Y_L^* = .0752$ and $Y_L^{**} = .0719$) and fulltime leisure incomes ($B^* = .0469$ and $B^{**} = .0435$). For purposes of comparison the budget set of the no redistribution policy ($t = 0$, $Y_L = w_L = .05$ and $B = 0$) is also included.

In this realistic example, the case for setting basic income at or close to its maximum is clearly supported by the maximin OS objective. How the case is undermined by adding the wage subsidy instrument is shown next.

¹⁰ This is a consequence of the labor supply function, which has unitary elasticity of supply ϵ with respect to net reward. For other (constant) supply elasticities, the revenue maximizing tax rate is $t^* = 1/(1 + \epsilon)$.

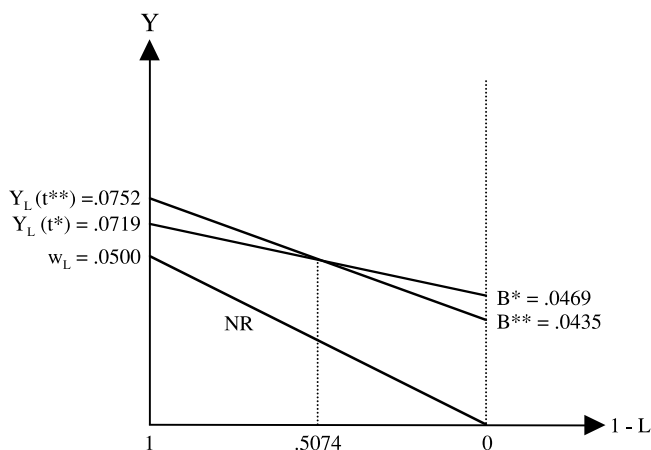


FIGURE 1. Budget sets of the least productive in regime T for $t = t^*$ and $t = t^{**}$, compared to no redistribution (NR)

2.4. UNDOMINATED POLICIES IN REGIME S

The values of the tax rate, wage subsidy and basic income of undominated policies in regime S are derived proceeding from equations (5), (6) and (7). The details are discussed in Appendix 1. An important property is that optimal basic income and wage subsidy are inversely related. This reflects the fact that the subsidy instrument creates more favorable work incentives for agents with low productivities than basic income does. The tax rate that services the opportunities of the least productive class can therefore be raised from the basic income-maximizing rate $t^* = 1/2$ up to $t = 1$, by progressively favoring the wage subsidy in the instrument mix at the expense of basic income. This corresponds to the choice of progressively higher values of L in the objective (6). Unlike in regime T, where $t^* = 1/2$ is the revenue-maximizing tax rate, it is the revenue-minimizing one in regime S. When the tax rate is raised by increasing the wage subsidy, total revenue expands, but the revenue available for redistribution in unconditional form will necessarily shrink. Thus in regime S, the least advantaged can be made to benefit from more extensive redistribution than in regime T, but only on the condition that the transfers are designed to increase their net rate of reward, by means of the wage subsidy.

When the tax rate becomes unity, all wage income is taxed away, and net reward is equal to the uniform wage subsidy. Policies with $t = 1$ have the same budget sets for individuals with different productivities, each of whom can thus earn a fulltime income equal to the sum of basic income and wage subsidy while receiving only basic income at full leisure. There are

several such equal budget policies, depending on the relationship between the wage subsidy and the level of average productivity. In particular, when $s = \bar{w}$, the wage subsidy absorbs the entire tax revenue and basic income is zero as a result. For levels of subsidy below or above average productivity at $t = 1$, basic income is positive or negative, respectively. Equal budget policies with negative basic income require a poll tax to supplement the revenue of income tax needed for financing a subsidy in excess of average productivity. Under such policies, net income is positive only after a certain amount of work has been performed. Negative basic income policies will thus elicit an especially high labor effort.

The numerical example of 2.3 is used in Figure 2 to illustrate the possibilities opened by the wage subsidy instrument. This is done by showing the budget sets of the least productive under various undominated policies of regime S. Budget set I belongs to the basic income-maximizing policy obtained by setting $L = 0$ in (6), at which $s = 0$. It is identical to the one of the basic income-maximizing policy (B^* , t^*) of regime T in Figure 1. Budget set I is compared to three equal budget policies which obtain in regime S when L is raised sufficiently to pitch the optimal tax rate at unity by using the subsidy instrument. At $L = .1929$, with $s = .3286$, fulltime income is .3462, and income at full leisure is $B = .0176$ (Budget set II). At $L = .3$, with $s = \bar{w} = .4$, $B = 0$. This is the zero basic income policy, with fulltime income .4, and no income at full leisure (Budget set III). At $L = 1$, with $s = .8667$, fulltime income is .5634, and income at full leisure is $B = -.3033$ (Budget set IV). This is the policy with the highest possible poll tax. The budget set (NR) of the no redistribution policy is also shown in Figure 2.

Our example now illustrates the challenge posed by the optimal policies of regime S, in each of which basic income and wage subsidies are combined in a particular mix. To favor the one instrument is necessarily to play down the other. So the proposal to maximize basic income and get rid of wage subsidies altogether will require a special justification. Such a justification is not provided by the doctrine of responsibility-sensitive compensation which underlies the maximin OS objective. Of course the same holds with respect to the justification of policies that favor high wage subsidies at the expense of basic income. But the point remains that in regime S, maximizing basic income is not required by the objective itself. Intuitively moreover, equal budget policies – and in particular ones with positive or zero basic income – seem rather attractive for two reasons besides equality. First, they offer very large net rewards to the least productive at a relatively small cost of foregoing (a part of) basic income (compare budget set I to either II or III in Figure 2). Second, these equal budget policies compare favorably to the basic income-maximizing policy when utility functions are taken into account in policy evaluation. For

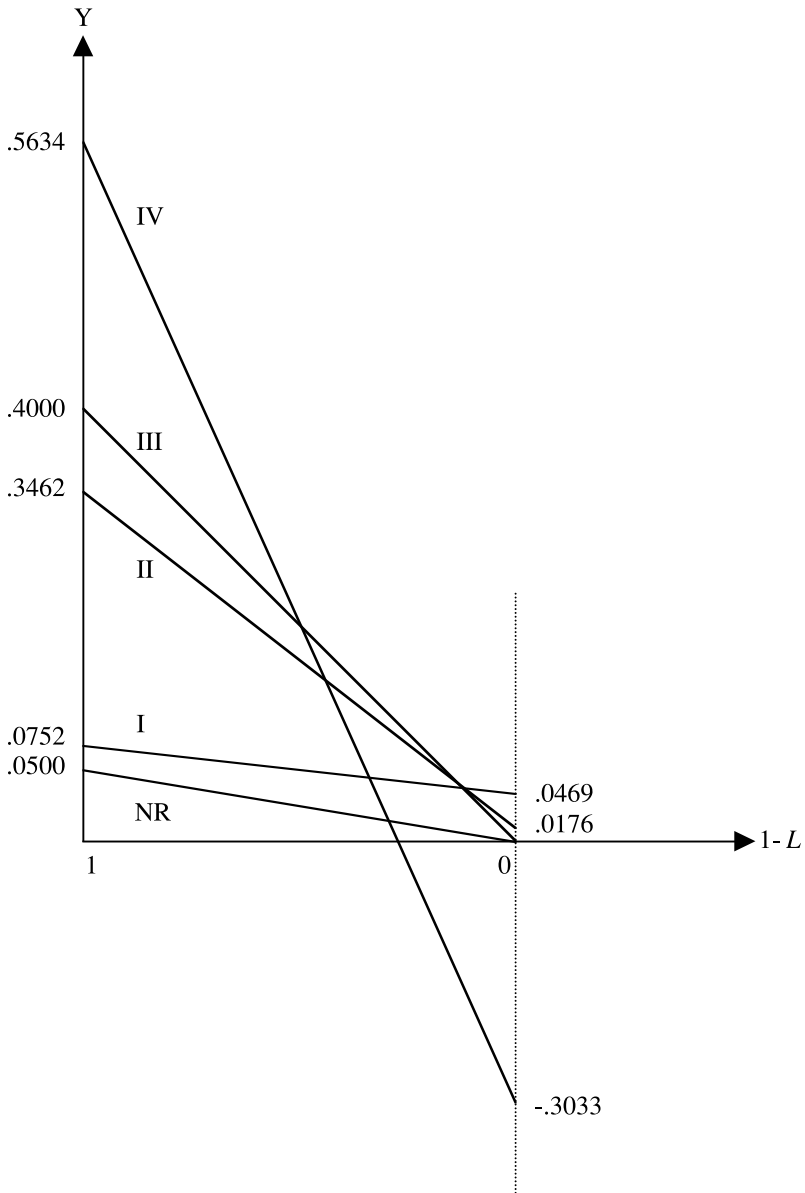


FIGURE 2. Budget sets (I–IV) of the least productive in regime S, compared to no redistribution (NR)

example, maximizing basic income only fully benefits the least productive reference agent with a zero propensity to work ($\hat{e} = 0$) while setting basic income at zero maximizes the utility of the reference agent with the average

propensity to work ($\hat{e} = \bar{e}$).¹¹ In sum, it is not easy to see what the special appeal of the basic income-maximizing policy would be in regime S. In the next section this aspect of the challenge to maximum basic income is further investigated.

3.1. SELECTING AMONG UNDOMINATED POLICIES

When there is agreement on the maximin OS objective but not on the choice among particular undominated policies, it seems reasonable to delegate the choice to the political process. While granting this, I want to consider some normative considerations which might play a role in the political debate.¹² The structure of responsibility-sensitive justice suggests two general approaches to the policy choice. The first focuses on the fair treatment of persons who choose to work different amounts due to their responsible factor of income-leisure preferences, given that their non-responsible factor, productivity, is subject to the maximin compensation rule of the objective. Call this the *adjudication approach*. By contrast, individual differences in the responsible factor are ignored in the second approach, which focuses instead on more specific ways of compensating for the non-responsible factor, consistently with the maximin OS rule. Call this the *compensation approach*.

Both ways of addressing the selection problem are relevant for the political choice of an undominated policy, and salient instances of each will be discussed below. Before launching that discussion, I state a background condition of salience. Within either the adjudication or the compensation approach, one may think of several different ways to pick a particular policy. I am only interested in normative criteria that can perform this job and can be said in some sense to support the maximin OS objective under which the selection problem arises in the first place. To take an example of what this rules out, consider theories of desert. Such theories

¹¹ See Appendix 1, Proposition 4. From the utility point of view, the policy with the largest poll tax (budget set IV in Figure 2) seems unattractive. The policy can not maximize the utility of any reference agent. This conclusion carries little weight, however, for it depends on our pragmatic decision to restrict the possible values of e to $[0,1]$, as explained in note 4 above.

¹² Compare Hild and Voorhoeve (2004, this issue). The authors describe a general framework representing various theories of equality of opportunity subject to the Pareto principle. They then propose a leximin criterion to compensate for disadvantages arising from the morally irrelevant characteristics of individuals. When applied to any well-defined economic environment, this criterion generates a set of undominated policies, which can be narrowed down only by introducing additional normative considerations of policy choice. In fact, the undominated policies which are derived from the maximin OS objective specify Hild and Voorhoeve's general framework within the economic environment of regimes T and S, with e and w as the morally relevant and morally irrelevant characteristics of individuals, respectively, and with OS as the metric of advantage.

are undoubtedly important, but they do not support the maximin OS objective. In the context of the model, a desert theory aspires to fix the distribution of income by specifying some desert base for rewarding the labor supplied by individuals. It does not support any deviation from the designated distribution to accommodate undominated policies. This is why I shall leave desert aside, even though some undominated policies might actually be endorsed by a particular desert base.¹³ Each of the salient criteria for policy choice to be discussed below gives definite recommendations regarding the best mix of wage subsidies and basic income. These recommendations may sometimes reinforce one another. Or they may conflict, either within the same approach, or across the two. In a final overview, I draw some conclusions about the contest between the two instruments of redistribution.

3.2. THE ADJUDICATION APPROACH

Each undominated policy in regime S imposes a unique structure of rates of net reward, given by $w(1 - t) + s$. Moreover, a subset of undominated policies optimizes for some reference preference \hat{e} . Each policy of that subset identifies a net reward structure which maximizes the utility of members of the least productive class with a preference coefficient $e = \hat{e}$, given that individuals choose their utility-maximizing labor supply by acting upon the incentives provided by the net reward they face. Within the adjudication approach, the problem of balancing the interests of least productive agents who make different labor supply decisions can be regarded under two distinct viewpoints, which I call "reward" and "representation." Reward criteria seek to determine the fair structure of net reward. They do not take into account the actual distribution of labor choices. By contrast, representation criteria seek to determine the fair reference preference precisely on the basis of that distribution, without making any judgements about the fairness of reward structures. It may be that the same policies get selected under either of these two viewpoints. But the reasons for selecting those policies will be different, depending on whether one focuses on fair reward or fair representation.

To illustrate the viewpoint of reward, I discuss two principles: "reciprocity" and "natural reward." Both principles explicitly assume the existence of a compensation framework such as the maximin OS objective. But they put forward different ideas concerning the appropriate structure of reward that should be in force within this framework. The egalitarian principle of reciprocity is formulated by White (1997, 1999). It holds that

¹³ For example, reward according to labor input selects the zero basic income policy. But reward according to productivity weighted labor input would select the policy of no redistribution.

entitlements to a share of the benefits of social cooperation in a society that confers equal or maximin opportunity are to be conditional on people's willingness to make a productive contribution in return, provided that they are able to work. In the present model everyone is able to work. Then the reciprocity conception of fair reward states that it is morally preferable to choose undominated policies that grant no benefits without work; hence it rejects basic income as an instrument of redistribution. Basic income permits people to live off the efforts of others, letting these others sustain the egalitarian scheme of cooperation. This is regarded as unfair, independently of whether or not the scheme is economically feasible when some individuals decide to spend their lives outside the sphere of production.¹⁴ So the reciprocity principle prefers the wage subsidy instrument. It thus selects undominated policies with $B \leq 0$.

Whether the reciprocity principle should embrace negative basic income policies remains somewhat unclear. Using a poll tax to raise the rate of net reward above average productivity is certainly a way of making sure that there can be "no benefit without work." But it is vulnerable to the objection that imposing the poll tax is certainly not necessary for that purpose, while it penalizes those who highly value their free time. For this reason, poll taxes can be seen as an unfair way of implementing egalitarian reciprocity. The objection is met by adopting a symmetrical version of the principle, which says that no able-bodied person should receive compensation without work, nor be subject to levies regardless of work performed, if the compensation scheme is sustainable without such levies. This seems to me more defensible than the version proposed by White. It rules out negative basic income policies and uniquely selects the zero basic income policy. White himself does not consider the possibility that the government might raise revenue by means of poll taxes. However, his preferred scheme, the "egalitarian earnings subsidy," does single out the zero basic income policy. So it may be thought that White does not reject the symmetrical version of reciprocity, in cases where poll taxes are on the political agenda.¹⁵

I now turn to the principle of natural reward. That principle is introduced by Fleurbaey (1998) in an axiomatic treatment of responsibility-sensitive schemes of egalitarian compensation. Unlike reciprocity, the

¹⁴ White does hold that individuals may discharge their moral obligations of making a contribution to the egalitarian scheme by performing unremunerated care work. This may open the possibility of dispensing B under conditions of a participation income. See van der Veen (1998: sec. 4) for further discussion.

¹⁵ The equivalence of the egalitarian subsidy scheme and the zero basic income policy is discussed in Vandenbroucke (2001: sec. 15). In terms of regime S , the egalitarian earnings subsidy (EES) is the ratio of income tax minus wage subsidy to gross earnings under the zero basic income policy, i.e. $EES = (tw - s)/w$ with $t = 1$, $s = \bar{w}$. Then for a person with productivity w , $EES = (w - \bar{w})/w$.

idea of natural reward refrains from judgments on how individuals should fairly behave under the compensation scheme. Rather, the idea is inspired by a liberal attitude towards individual choice. The principle of natural reward says that the reward structure spontaneously arising in an economic environment with equal freedom of choice should not be interfered with by redistributive intervention, provided that the non-responsible factors of individuals are distributed equally. Such a protected reward structure is called a “natural reward scheme.” The liberal appeal of the principle is that natural rates of reward reflect the joint exercise of responsible factors by free individuals, whose agency one should equally respect. Thus the principle asserts that the natural reward scheme is the neutral way to adjudicate the interests of people who act upon their different preferences. To impose a different reward structure through redistributive intervention or by means of other non-contractual impediments is regarded as unfair discrimination in favor of some agents and against others.

On first sight it would seem that the principle of natural reward is irrelevant in the present context. Our problem of policy evaluation arises because the maximin OS objective is in place in order to compensate for existing inequalities in the non-responsible factor of productivity. Thus the situation we are considering here contains no natural reward scheme, since the proviso under which such a scheme actually exists in the economy is not satisfied. However, the principle of natural reward can be brought to bear on our problem in an indirect way. This is done by asking what the natural reward scheme would be like if productivities were equal in the economy and if all other features of the economy were the same, including the distribution of preferences and average productivity. Such a counterfactual natural reward scheme serves as the benchmark for selecting the appropriate structure of net reward from among undominated policies under the maximin OS objective. The rationale of this proposal is as follows. After compensation, the incentives under which people decide to deploy the responsible factor of labor choice should be as close as possible to the ones that would obtain if productivities were equal and there would thus be no need for compensation in the first place, everything else remaining the same in the economy. Given the assumptions of the model, the counterfactual natural reward scheme will have equal reward at the level of average productivity. As a result, the proposed application of the natural reward principle unfailingly selects the zero basic income policy, since this is the only undominated policy which sets everyone’s net reward at average productivity. It should be noted that the counterfactual scheme of natural reward may well be a different one, whenever differences in non-responsible factors other than productivity exist. I return to this point in section 4.

Having discussed two criteria of fair reward, let me now consider the viewpoint of fair representation. As indicated above, one can seek to adjudicate the interests of least productive persons by using utility information. This supplements the information regarding their well-being already given by the OS metric and so enables the government to identify conflicting interests with regard to its policy choice. The aim is to state a reference preference which fairly represents different interests, given the distribution of preference coefficients in the population. Recall from 1.2 that preferences and productivities are assumed to be statistically uncorrelated. Thus the distribution of e in the least productive class is the same as in the population. It is assumed that the government has knowledge of this distribution. On this view of adjudication, an obvious rule of fairness is to give each individual equal weight in the determination of the reference preference. This immediately eliminates policies which maximize utility for non-represented values of e . For example, in the numerical example of 2.4, the policy that imposes the highest poll tax is suboptimal for even the most workaholic among the least productive, hence it cannot be recommended. More strongly, the fair reference preference settles on a central tendency of the distribution. Taking the average ($\hat{e} = \bar{e}$) will lead to the zero basic income policy.¹⁶ Alternatively, one could decide in favor of the policy that maximizes median or even modal utility. The policy choice then depends on the form of the distribution of e . For example, if it is unimodal and negatively skewed, as one might suppose if preferences are partly shaped by a work ethic, then the median and the mode exceed the average. The choice of either of these parameters selects an equal budget policy with negative basic income in preference to the zero basic income policy. In any case, the basic income-maximizing policy, which maximizes the utility of the absolutely work-shy, is rejected by any credible criterion of fair representation that purely depends on utility information.¹⁷

¹⁶ Note that when utility is assumed to be interpersonally comparable and can be added (ignoring the difficulty mentioned in note 6), the zero basic income policy maximizes aggregate utility of the least productive class. The policy would then be preferred by the opportunity-egalitarian framework of Roemer (1998).

¹⁷ A more complex method of balancing interests has been proposed by Vandenbroucke (2001: chs. 1 and 3). Its point of departure is to impose an interpersonally comparable "metric of advantage," given that utility is non-comparable. This metric specifies a socially authorized tradeoff between labor income and leisure, on the basis of some ethical theory of the good which the government decides to accept. Individuals are now assigned a set of advantage scores by calculating the advantage from the particular amounts of work and leisure they actually decide to supply under different undominated policies, given their preference coefficients. Then the policy is chosen which maximizes the average advantage score for the least productive. This amounts to a quasi-utilitarian method of policy selection. But to the extent that it remains unclear just how the metric of advantage is fixed in the face of competing ethical justifications, this method is indeterminate.

3.3. THE COMPENSATION APPROACH

I first discuss three criteria that refine the maximin rule of compensating for the non-responsible factor of productivity: *improvement over no redistribution*, *equality* and *weak leximin*. Each of these criteria accepts the OS metric of the compensation objective and selects among undominated policies in a different way. Then I consider the *maximin area* criterion. It specifies the compensation objective by using a more discriminating opportunity metric of well-being, which is defined by the area under the budget set of least productive individuals. By means of this “area metric” the crossing budget sets of each pair of undominated policies can be ranked. The maximin rule then selects the policy with the largest area under the budget set.

Arguably a necessary feature of any maximin compensation scheme is that if feasible, all worst-off individuals must be made better off than they were before, in the absence of compensation. To illustrate this powerful criterion of *improvement over no redistribution* (INR for short), consider regime T in the numerical example of 2.3. All its undominated policies satisfy INR, because each of them dominates the no redistribution policy (see Figure 1). In regime S, however, only the undominated policies with zero or positive basic income satisfy INR. This is because the budget sets of the least productive under policies with negative basic income cross the budget set of the no redistribution policy. By choosing such policies, therefore, some options which are available to the least productive under the baseline of no redistribution are removed. This is illustrated by the numerical example of 2.4 (compare budget set IV to budget set NR in Figure 2). In terms of the OS metric, negative basic income policies fail to improve the situation of any worst-off person, while other undominated policies maximally improve the opportunities of every worst-off person, relative to the baseline. Moreover if one takes account of utility information, the (leisure-intensive) baseline options removed by the choice of a negative basic income policy may well be valued more highly by some individuals than the (work-intensive and lucrative) options which they get in return. This makes such individuals worse off after compensation. So in regime S, the INR criterion bites. It rules out compensation schemes with poll taxes, but it does not provide guidance for choosing between zero and maximum basic income. I believe this to be a rather important result.

Next consider two additional criteria of compensation: *equality* and *leximin*. Properly understood, both of these criteria support the maximin

Government may favor a wide range of instrument mixes, depending upon the prior choice from among a multitude of defensible “metrics of advantage.”

OS objective in contrasting ways. From a constrained egalitarian point of view, maximin compensation is attractive because it carries equality just to the point where accepting a more equal distribution would be detrimental to the interests of those who suffer most from inequality, i.e. the worst off. If this is what motivates maximin compensation, then equal budget policies should be preferred to unequal budget policies. For, on the OS metric, equal budget policies eliminate the impact of productivity differences on opportunity, without making the least productive strictly worse off in opportunity. The equality criterion thus rejects the basic income-maximizing policy. The reason is not that equality objects to using the instrument of basic income to the fullest extent. It rather objects to choosing the policy which sets the tax rate at its lowest value ($t^* = 1/2$), because this causes productivity-based advantages that cannot be supported by reference to maximizing the position of the worst off.

Alternatively, the maximin OS objective may be motivated by prioritarian intuitions. Then the fact that some undominated policies allow productivity to cause inequality of opportunity plays no role. What counts is that the worst off be made as well off as they can possibly be (Parfit 1997). On the OS metric, any undominated policy of course meets that condition. From the prioritarian point of view, then, there is no principled objection against attending to the interests of more productive individuals. This focuses attention on the merits of unequal budget policies under the leximin criterion of compensation. Since all unequal budget policies have positive basic incomes, the basic income-maximizing policy may be among the ones favored from the leximin point of view.

When exploring this route, however, the leximin criterion should be carefully specified, in view of the peculiarities of the OS metric. Consider first the standard interpretation of the criterion. In selecting among alternative policies, standard leximin operates with the following rule of lexicographic preference: The interests of the second worst-off individuals, and so on up the scale, come into play only if there are at least two policies which make the worst off as well off as they can be and equally well off besides. It is easy to see that standard leximin is useless for policy evaluation, for is trivially satisfied in the application to undominated policies. Since such policies are non-comparable on the OS metric, no two of them can provide both maximal and equal opportunities for the least productive. On the lexicographic preference rule just stated, this rules out consideration of the interests of individuals with the second lowest productivity, and so on up the scale. Therefore the standard leximin criterion is here unable to perform the job for which it was designed. Second, consider a weak version of the criterion. Weak leximin is defined by relaxing the lexicographic preference rule as follows: The interests of the second-worst-off individuals, and so on up the scale, come into play

only if there are at least two policies under which the interests of the worst off are satisfied maximally and are either equally satisfied or mutually incomparable.

When weak leximin is applied to undominated policies, the interests of the better off have to be taken into account. And so it needs to be asked whether some unequal budget policies afford superior opportunities to higher productivity classes under the weak rule of lexicographic preference. If this is the case, then weak leximin may recommend maximizing the level of basic income. In regime T, it provides no such recommendation. In the absence of the wage subsidy, the budget sets of any two undominated policies cross irrespective of productivity. Hence the opportunities of the well off are incomparable across the policies of regime T, just like those of the worst off are. Weak leximin has no bite in regime T.

In regime S, however, weak leximin can indeed single out the basic income-maximizing policy. To show this, one must compare the budget sets of productivities above w_L under each of the policies we are here considering. Recall that these policies are undominated for w_L , but not necessarily for higher productivities. In general, no budget set of the basic income-maximizing policy (BI for short) will ever be dominated by that of another policy, for the same productivity class. Since BI has highest basic income, the budget set will always cross the budget set of other policies, regardless of the level of productivity. But for weak leximin to select one single policy, that policy must dominate all others for some $w > w_L$. So if such a policy exists, then it is BI.

Next, BI will be selected by weak leximin if and only if fulltime income under BI at least equals fulltime income under any other policy, for some $w > w_L$. The question is whether this condition can actually be satisfied. This turns out to depend on the parameters of the model. In some economic circumstances, in particular when average productivity is rather low, the basic income-maximizing policy may indeed offer superior opportunities to individuals with high productivities, compared to any other undominated policy. For instance, take the numerical example of 2.4. Now reduce average productivity from $\bar{w} = .4$ to $\bar{w} = .3$, with the other parameters remaining the same. For $w \geq .933$, BI beats all other policies (see Appendix 2).

As an alternative to refining the maximin criterion by adding on other compensation criteria such as INR, equality, or weak leximin, I now consider a different strategy. The strategy is to refine the OS metric on which the maximin criterion operates without bringing in any information that refers to the preference coefficients of individuals. The reason for exploring this route is that on the OS metric of well-being, policies which best serve the interests of the least productive are incomparable, whatever the respective shapes of the corresponding budget sets may

otherwise be. This may be hard to accept whenever the budget set of one undominated policy offers vastly superior income-leisure options than the budget set of another, save for a small range of options, in which it is only somewhat inferior. In 2.4, this difficulty was raised in a comparison of the maximum and zero basic income policies (budget sets I and III in Figure 2 respectively). On switching from the former to the latter policy, the loss of maximum basic income is matched by a comparatively huge gain in net earnings at fulltime work. Of course that gain is irrelevant to those who are highly work-averse and know that they will remain so forever. Such persons will see no reason to prefer the zero basic income policy. But if income-leisure preferences of individuals are highly flexible, then the size of the relative gain matters. For instance, suppose the choice is between the maximum and zero basic income policies and someone thinks it equally probable that he will be induced to supply labor in future periods at either $e=0$ or $e=\bar{e}$. If he maximizes expected income on this assumption, then he will choose the zero basic income policy, in the example of 2.4.

As mentioned in 2.1, the OS metric can be interpreted as a measure of an individual's real freedom by regarding each option of the budget set as one freely available choice that the person conceivably might want to make. This suggests a type of flexibility that goes beyond what agents would consider on the basis of radical uncertainty regarding their preference coefficient. In particular, one can propose that the budget sets of undominated policies are to be ranked by the size of the expected income of the least productive, when all feasible levels of labor input are given equal probability. Then the value of the opportunities to the least productive under an undominated policy is measured by the area under their budget set, or more precisely, by the integral of the budget set over $L \in [0,1]$. Since budget sets are linear, the area defined by the integral is $1/2(w_L(1-t) + s) + B$. Call this measure the "area metric."

On this metric, the maximin objective selects the undominated policy that maximizes the area under the budget set of the least productive. As shown in Appendix 3, it is the policy corresponding to $L=1/2$ in Equation (6). This policy may have a positive, zero or negative basic income, depending on the sizes of the average preference coefficient and average productivity. Acceptance of the maximin area criterion implies that the basic income maximizing policy is firmly ruled out, since that policy requires setting $L=0$.

3.4. THE CASE AGAINST MAXIMUM BASIC INCOME

The criteria for policy choice discussed above suggest a strong case for preferring the policy with a wage subsidy at average productivity and no basic income to the policy with no wage subsidies and maximum basic income. This case can be put most simply if it is accepted (as I would be

inclined to do) that negative basic income policies are undesirable, given the power of the INR criterion. With these policies out of the way, the verdict is clear. Only the weak leximin criterion can provide grounds for choosing maximum basic income. All remaining criteria reject that choice, and some squarely support the zero basic income alternative.

This result may be regarded as inconclusive, especially if one feels attracted to leximin reasoning. However, two considerations undermine that reasoning. First, maximizing the level of basic income will not invariably improve the opportunities of more productive people. Whether it does so or not depends on empirical conditions. Secondly, weak leximin is vulnerable to the objection that its lexicographic preference rule conflates non-comparability with indifference. To explain, suppose that high productivity people actually do have better opportunities, if it is decided to maximize basic income rather than setting it at zero. Weak leximin justifies this choice by arguing that since it is impossible to decide on either policy by looking at the opportunities of the worst off, there is a prioritarian reason for letting the interests of the better off break the tie. The objection is that non-comparability of policies does not constitute a “tie” in the relevant sense, unless it is established that the worst off are indifferent between the two alternatives. But the worst off will not be indifferent. Given their current preferences (in any realistic distribution of e), most of them will in fact prefer the high-income budget set associated with zero basic income. Similarly, under the radical flexibility assumption of the real freedom interpretation, *all* worst off individuals will prefer zero basic income, if this happens to give them the largest expected income of the two policies. The objection concludes that weak leximin is not a compelling criterion, in and of itself. It can only carry weight in the policy choice if additional reasons are adduced to ignore the preferences on the part of the worst off.¹⁸

This section has shown that there are reasons for being very skeptical about the claim that basic income is the favorite instrument for achieving the maximin OS objective, if the instrument of wage subsidies is available, as it is in regime S. Of course the model underlying regime S is unrealistic in several ways, and it may be asked whether our conclusion holds outside of it.

4.1. UNEQUAL EXTERNAL ENDOWMENTS AND NATURAL REWARD

The merit of Vandenbroucke’s work on wage subsidies is that it shows how strongly liberal egalitarian reasoning in favor of basic income

¹⁸ Note that the same objection can be applied to the equality criterion of compensation, which “breaks the tie” between two undominated policies by choosing the one that minimizes the impact of productivity differentials on opportunity. Unlike weak leximin, however, the equality criterion does not conflict with any of the other criteria except (possibly) weak leximin, as far as the basic income versus wage subsidy issue is concerned.

has depended upon assumptions about the policy instruments of a redistributive government. In my own writings, basic income was defended along lines similar to the argument of 2.3: in regime T, with the lowest productivity close to zero, maximin OS demands setting basic income at (close to) its maximum level. That argument, as has become clear by now, only works if wage subsidies are infeasible for some reason. This section assesses the generality of this finding by looking beyond the confines of the present model. Below I ask how the conclusion of section 3 is affected if unequal opportunities are caused by differentials in external rather than internal endowments. As will be seen, the principle of natural reward then constrains undominated policies in various different ways. But this does not salvage the case for basic income. Real world complications are finally analyzed under three catchwords: human capital formation, responsibility, and the subsistence constraint. I conclude in 4.2 that under plausible empirical conditions, the maximin OS objective may support unconditional redistribution.

As Van Parijs (1995) has argued, the case for basic income can be made to rest exclusively on taxation of external endowments. In the real world, people are differentially endowed with natural resources, ecological assets (e.g. pollution rights) and ownership of capital goods. Imperfect competition on labor markets also creates differential access to rents of job assets, which can therefore be included among taxable external endowments. Van Parijs offers the following two-stage argument.¹⁹

- (A) If the social objective is to maximize the opportunities of the least advantaged (*leximin real freedom*) subject to a “Dworkinian” constraint of fair reward, then the market value of all external assets should be taxed up to the revenue-maximizing point, and revenue is to be redistributed in the form of a basic income. In advanced societies, this program requires both taxes on wealth and earned income. It is likely to generate a high basic income, compared to subsistence requirements.
- (B) Internal resources of talent should not be assessed by market earning power, but by Ackerman’s criterion of undominated diversity. Against the background of the high basic income which taxation of external assets makes available to all, a defensible scheme of compensation will turn out to benefit only the severely handicapped. That scheme can be financed by a relatively small reduction of basic income below its maximum level.²⁰

¹⁹ The two stages are worked out with care in Van Parijs (1995: chs. 2–4).

²⁰ The intuitive argument is that when tastes regarding the possession of varied internal endowments in society are highly diverse, there will exist unanimous agreement on the inferiority of one person’s comprehensive bundle of (internal and external) endowments in pairwise comparisons with the comprehensive endowments of other persons only if

This outline suggests that the challenge to basic income that I have been discussing – from within a model that ignores external resources and which treats internal resources in the wrong way – can simply be set aside as irrelevant. To show that the challenge applies to Van Parijs' argument nonetheless, I shall focus on his starting point. This is a simple world, in which unequal external resources consist only of wealth, defined as the competitive value of natural resources and existing capital goods. Individuals are equally productive, because of equal talents. In this world, so Van Parijs concludes, *leximin* real freedom requires that wealth endowments of gifts and bequests must be taxed so as to maximize the sustainable level of basic income.

To see whether this conclusion survives in the presence of the wage subsidy instrument, it is necessary to specify the following features of Van Parijs' simple world. Preferences for income and leisure are diverse, and people are held responsible for acting on them. The same holds for preferences to form wealth (by saving income) and to pass wealth holdings on to significant others. Opportunities of real freedom are conferred by the individual's budget set, which is determined by (equal) earning power and (unequal) lifetime wealth endowments. The worst off are those with zero wealth endowments. The objective can now be implemented by proportionally taxing wealth or income, and redistributing through a mix of basic income and wage subsidies. As in our model, then, there will exist a set of undominated policies, each of which takes care of the opportunities of the worst off.

According to Van Parijs the most defensible policy (which I call BI) has three features: (1) only wealth endowment should be taxed; (2) tax revenue should be distributed as basic income; and (3) basic income should be maximized. Obviously, (3) is required by the objective, given (1) and (2). Therefore the first two features of the BI policy need to be explained by reference to the "Dworkinian" criterion of fair reward in stage (A) of Van Parijs' argument. Though I can not argue this in detail here, I believe that this criterion is an instance of the principle of natural reward. In any case, that principle nicely explains Van Parijs' reasoning in the simple economy he takes as his starting point. To show this, consider the counterfactual natural reward scheme of the simple economy. Recall from 3.2 that this is the structure of reward which obtains if non-responsible factors of individuals are distributed equally, all other economic data remaining the same. The counterfactual scheme of natural reward thus has equal productivities and equal wealth endowments. As I have applied the principle of natural reward, the government should

the internal endowments of the first person are seriously defective from almost any point of view, given that a substantial basic income is available to all. Undominated diversity is thus a very weak criterion of evaluation. See Van Parijs (1995: 74–9).

choose the undominated policy which copies the counterfactual scheme's reward structure, if possible, or otherwise approximates it most closely.²¹ In the present case, the policy that copies the counterfactual scheme (by equalizing after-tax wealth) is a dominated one, as Van Parijs also notes. Now the question is whether his favored BI policy does indeed come closer to the counterfactual scheme of natural reward than wage-subsidizing undominated policies do.

So let us next consider policy WS, which proportionally taxes both wealth and labor income at their revenue-maximizing rates and distributes the entire revenue in proportion to work performed. In that case, of course, labor income might as well not be taxed. Now compare these two undominated policies, WS and BI, in terms of Van Parijs' two crucial features. Both are wealth-taxing only, hence both satisfy feature (1). And WS violates feature (2), since it redistributes by means of the wage subsidy instead of basic income. According to Van Parijs, therefore, WS must be rejected. This is indeed confirmed by the principle of natural reward. For obviously, BI comes much closer to the reward structure of the counterfactual scheme than WS does, because the reward structure of WS distorts incentives in favor of workaholics (Van Parijs' "Crazies") and against the work-shy (the "Lazies") in a way that BI does not do. Moreover, *all* wealth-taxing policies with a wage subsidy that prevents basic income from being maximized will be rejected by the principle, on the liberal ground that this interferes with the responsible choices of free agents in ways not required by leximin real freedom.²²

So in the simple economy initially envisaged by Van Parijs, maximum basic income is supported by the principle of natural reward. This sharply contrasts with the model of regime S, where natural reward selects the

²¹ To select the "Dworkinian" fair policy of compensation from among the policies which maximize the real freedom of the worst off, Van Parijs chooses the counterfactual italicized in the following quote: "There is a non-arbitrary and generally positive legitimate level of basic income that is determined by the per capita value of society's external assets and must be entirely financed by those who appropriate these assets" (Van Parijs 1995: 99). Setting basic income at this per capita value mimics the allocation of resources that would result from a Dworkinian hypothetical auction with equal token money. Dworkin requires that following the auction, the distribution of resources must at any moment in time "reflect the cost or benefit to others of the choices people make, so that, for example, those who choose to invest rather than consume, or to consume less expensively rather than more, or to work in more rather than in less profitable ways must be permitted to retain the gains that flow from these decisions in an equal auction followed by free trade" (Dworkin 2000: 89). By thus prohibiting redistributive intervention, Dworkin treats this imaginary free trade economy as constituting a scheme of natural reward. Once talents are assumed to be unequal, of course, the free trade economy can no longer serve that purpose. See Van der Veen (2002: sec. II).

²² Likewise, any undominated policy which taxes labor and wealth to finance a higher basic income than is attainable under BI will be rejected by the principle of natural reward as unfairly benefiting the work-shy and penalizing the workaholics.

zero basic income policy. The implications of the principle thus depend on what the non-responsible causes of unequal opportunity are taken to be. When inequality flows from wealth transfers under gift and bequest and not from raw talent, the verdict comes down in favor of basic income rather than wage subsidies. In the real world, both factors are relevant. But let us just assume that Van Parijs is right to focus on external resource inequality. Even then, something can be learned from studying differences in people's ability to earn income from work. The lesson is that natural reward does not support unconditional redistribution, if external assets enhance this ability, just like talent does in regime S and unlike wealth endowments do in the simple model just considered. So even if one additionally agrees with Van Parijs that external asset inequalities should be compensated in line with the principle of natural reward, this need not create a case for basic income.²³

This becomes clear once we go beyond the simple model and consider the advantages people derive from external job assets, which Van Parijs wishes to capture by widening the tax base from gifts and bequests to earned income (see stage A of his argument). Job assets play a role in economies where production is organized through employment contracts, and labor markets do not invariably clear. The opportunity to earn and enjoy non-pecuniary benefits by holding a job then becomes a scarce and unequally distributed asset even among people with the same talent. Conceptually, seizing the "employment rent" of job assets is a matter of taxing the difference between what the job would fetch if all labor markets would clear, as in a fully competitive world, and its actual remuneration in the real world. Total employment rent could then be redistributed as an additional basic income. But because of incentive considerations, it is preferable to tax employment rents at less than 100 per cent, given the concern with the opportunities of the least advantaged. Taking account of difficulties in correctly identifying the size of employment rents for different jobs, Van Parijs therefore concludes that in practice labor income should be taxed up to the point at which the tax yield, and hence the basic income financed by it, is maximized. And as he recently emphasizes, job assets have become increasingly important in a complex knowledge and communication-based economy:

how much a person with given talents will manage to earn is heavily dependent on what productive slots her connections, her training, her citizenship, her place of residence, her mother tongue, the fluctuations of her temper, and sheer luck will enable her to occupy, and on how well

²³ One need not agree, of course. And then Van Parijs' case for basic income is by no means conclusive even in the simple world. As I have argued earlier, it is hard to deny that other normative criteria besides natural reward bear on the choice between undominated wealth tax-financed policies. For example, adherents of reciprocity will reject BI in favor of WS, whatever the source of non-responsible inequality may be (Van der Veen 1998: sec. 3).

she fits in, in that slot, with co-workers, bosses, and clients as well as local culture and technology. Consequently, it is wrong to imagine that one could address the growing inequality of earning power by identifying and correcting inequalities in people's internal endowments. (Van Parijs 2003: 204–5)

Now in regime *S*, differences in productivity depend on internal endowments only. As Van Parijs rightly observes, this is unrealistically restrictive. So let us instead suppose that internal and wealth endowments are equal and that individual earning abilities differ due to complex interactions between the external factors cited above. Will the principle of natural reward now support the BI policy? One might suppose that it does, if those factors are regarded as arbitrarily distributed "gifts" in the same way as transfers of wealth between or within generations constitute "gifts" to their recipients in the simple world of equal talent. This is indeed how Van Parijs urges us to regard the matter. And he concludes that the liberally unbiased thing to do, therefore, is to distribute the tax yield from all such gifts equally and not as a function of the number of hours that people choose to spend working or display a willingness to work.²⁴

From the point of view of natural reward, however, locational or linguistic advantages are not at all similar to wealth endowment. What counts is that to obtain benefit from various favorable circumstances that enable you to cash in on the rent of a particular job asset, you must first spend time and effort in positioning yourself for the job in question and then perform work on the job itself. This shows that the "gifts" that cause unequal access to the rent of job assets are relevantly similar to internal endowments which determine productivity and relevantly different from the external endowments of wealth, which do not. If these "gifts" are as important for understanding inequality of earning power as Van Parijs claims they are, then the counterfactual structure of natural reward that guides us towards a fair compensation scheme for the real world must be very unlike the one of the simple world from which his argument takes off and rather like the one of section 3.2. What our model indirectly shows, then, is that the liberal viewpoint of natural reward does not recommend maximum basic income to the extent that Van Parijs needs it to. Instead, that viewpoint recommends wage subsidies to compensate for the low productivity of the employed, as well as benefits for the involuntarily unemployed.

4.2. HUMAN CAPITAL, RESPONSIBILITY AND SUBSISTENCE

Can the case for basic income be strengthened by looking at other features of the real world? In addressing this, I continue to assume that

²⁴ Van Parijs (1995: 109–11) actually dismisses the use of wage subsidies and work-conditional unemployment benefits on the basis of this conclusion.

wage subsidies and basic income serve the redistributive purposes of maximin OS. Consider human capital formation. In the face of this first complication, it may be asked whether heavily wage-subsidizing policies (WS) actually have more favorable overall incentive effects, compared to heavily basic income-intensive policies (BI). Any income tax-financed policy of redistribution will tend to reduce net wage differentials, but it is clear that these will be more reduced by WS than by BI. In the longer run, human capital theory predicts that an equal reward scheme of compensation will especially discourage the development of productivity. The question is whether this incentive disadvantage of WS outweighs its advantage over BI in respect of raising the labor supply of the less productive. Over time, this may well be the case, depending on the relative responsiveness of human capital formation and labor supply to financial stimuli.²⁵ So there are good reasons to believe that the menu of undominated policies in the real world will not include the wage-subsidized equal budget policies that figure so prominently in regime S. On the other hand, human capital considerations suggest that the opportunities of the worst off can be improved through redistribution in kind. When there are efficiency arguments for public education and tax-financed educational grants, this sets a limit on maximizing unconditional redistribution, a point that adherents of basic income will have to take on board.

Once it is admitted that productivity partly depends on effort and resource investment, it ceases to be a purely non-responsible factor. This second complication affects the contest between basic income and wage subsidies indirectly. For it makes the objective of maximin OS harder to state with precision. The logic of responsibility-sensitive justice requires that people bear the consequences of decisions to develop the marketable features of their talents (and indeed for making an effort to discover what these features are), just as they are held responsible for the decision to put their skills and credentials to use in income-earning work. In reality, the government cannot directly observe native talent. So it does not have the detailed information to assign responsibility for human capital formation with any accuracy, even if some of the effort and resources expended in acquiring skills is observable.

There is another problem with assigning responsibility that the model of regime S ignores. In the model, the distributions of responsible and non-responsible factors are assumed to be completely independent. However, it is more likely that native talent, preferences to develop human capital, and preferences to work are positively correlated. Such preferences tend

²⁵ As mentioned in note 5, the model assumes that labor supply is excessively responsive to variations of net reward, compared to what one might expect in the real world. For the empirical link between wage ratios and enrolment rates in educational categories see figures 3 and 4 in Topel (1997: 70–1).

to be shaped by initial circumstances and get updated by the constraints of earlier decisions, depending on how things work out more or less fortunately during a person's life. These causal connections are hard to trace reliably. But they explain to some extent why those with valuable talents will often cash in on them, and people whose talent is valued less will often worsen the consequences by letting things go.

Both of these problems suggest that it is difficult to allocate responsibility in a reasonable way. In making people bear the consequences of their actions, it seems important to consider the causal origin of past decisions, the extent to which the consequences could be foreseen and the magnitude of the consequences further down the line. It is not at all clear how this issue should be resolved in the abstract. Some may insist on the robustly backward-looking conception of responsibility suggested by the sharp division between responsible and non-responsible factors in the simple model, while others may want to allow people to make a fresh start from time to time.²⁶ The precise formulation of the compensation objective depends on which of these views wins out in society.

Unreliable information and causal interconnections also make it harder to maintain that the liberal principle of natural reward should be as prominent in governing the choice among undominated policies as 4.1 has suggested. First of all, it becomes more difficult to agree on the relevant description of a counterfactual natural reward scheme once the distinction between responsible and non-responsible characteristics of individuals gets blurred in practice. Secondly, even if there is agreement, it may be that the liberally neutral compensation policy is too harsh on people who waste their chances. In the abstract models discussed so far, there is no good way of assessing this at all.

This last point leads to the third complication I want to bring in: the subsistence constraint. In regime S, the status quo against which government is assumed to adopt a compensation policy is the "no-redistribution policy." In the real world of advanced societies, it is some version of the welfare state. In the model, the no-redistribution policy is the baseline for assessing what different policies of compensation can achieve to improve the lot of the worst off. Indeed, this is made explicit by the proposal to reject undominated policies that fail to offer better opportunities compared to this baseline (INR). But that baseline is relevant only because the emaciated framework of the model lacks a subsistence constraint. Under no redistribution, the least productive of the model will

²⁶ Fleurbaey (2002: 86–7) tentatively defends compensation schemes that give people a fresh start. Instead of holding them responsible for all of the decisions taken long ago on the basis of a fair initial share, he proposes to discount decisions made from preferences which individuals no longer endorse. In a critical response, Dworkin emphasizes the fairness of the backward-looking view on responsibility (2002: 113n8).

never starve as a result of being worst off in opportunities to consume goods and leisure. If they want more to eat, then they can just work longer hours, undeterred by disability or unemployment. Unlike in a real market economy, the model has no risk of ending up destitute through bad luck, bad decisions or both.

Partly, the welfare state is a response to this. Considered as an institution of redistribution, its primary rationale is to provide basic security at a conventional level of subsistence and to pool risks of losing income above subsistence. Its means-tested general assistance laws and minimum wage statutes, as well as its job-related compulsory social insurance provisions are a way of ensuring that basic security and collective risk pooling are manageable, and to some extent consistent with requirements of fairness that individuals make a responsible effort to stand on their own feet. The leniency of such requirements varies a lot across countries. But even the tightest of work and means-tested arrangements cannot possibly satisfy the demands of backward-looking responsibility. At some point, no further questions will be asked about the individual causes of poverty and dependence.

So when the welfare state is accepted as the relevant status quo that needs to be improved upon, the problem of assessing the weight to be placed upon past decisions appears to be somewhat less dramatic than it seemed in the abstract. But that is not to say that it vanishes, as two possible ways of operationalizing the maximin OS objective may show. First, taxing earned income and wealth at the highest sustainable rate will maximally improve the budget sets of the lowest in actual earning capacity relative to means-tested welfare state policies. This amounts to discounting the consequences of responsible actions in the past which affect current earning capacity. To some uncertain extent, negligent net beneficiaries will be overcompensated, while net contributors, who have gained by foresight and hard work rather than by brute good luck, are overtaxed. Thus the responsibility-sensitive part of the objective is compromised. It may therefore be decided, alternatively, to tax at a lower than the economically sustainable rate of redistribution, perhaps not much in excess of the welfare state's rate. But to some equally uncertain extent, this second method of operationalizing the objective undercompensates "industrious" net beneficiaries and undertaxes "lazy" net contributors, thereby compromising the maximin part of the objective. As suggested above, which of these two options is preferred in the end will depend on contesting notions of holding people responsible.

In principle the choice between WS and BI policies remains the same under each of these two methods. However, if the normatively preferred rate of redistribution is well beyond that of the welfare state baseline, it will over time become possible to consider either high wage subsidies, or a basic

income at subsistence level.²⁷ And under some plausible assumptions, this may create a decisive advantage for BI policies, as I will show in conclusion. First, I here regard the worst off as those with zero wealth and a marginal position on the labor market. Considered over a lifetime, that is, their low skills are insufficiently in demand to earn them the subsistence income b , net of the welfare state tax. Secondly, the optimal tax rates of the BI and WS policies are assumed to be roughly equal and generate the same amount of tax revenue for redistribution. This assumption is motivated by the above-mentioned incentive difficulties of the wage-subsidizing solution. It implies that more work will be performed on average under WS than under BI, at a lower mean productivity, and that the WS and BI budget sets of the least advantaged cross at a value of L beyond the average amount performed under WS.²⁸ Third, budget sets of individuals are subject to the subsistence income constraint (i.e. $Y(L) \geq b$), and fourth, the work-conditional benefit provisions of the welfare state remain in place under the WS alternative. These last assumptions imply that the worst off, if able, are required to perform at least the amount of work that earns them subsistence at the subsidized rate of net reward, while if unable, they are topped up to subsistence level.

On these assumptions, the WS and BI policy both dominate the welfare state policy. However, BI also dominates WS, provided that one last condition is satisfied. The condition is that the worst off are unable to supply more labor over their lifetimes than is performed on average under WS. Then their budget set under BI dominates that of WS within the attainable range of L . This is because the crossing point of the two budget sets, beyond which income under WS exceeds that under BI, occurs at an amount of work which the least advantaged cannot perform. Is this last condition a plausible one? I certainly believe it is, for the marginal position of the worst off on the labor market is not only due to their low productivity per hour. To the extent that low-skilled work is less in demand, they are also more vulnerable to long spells of unemployment. In addition, they

²⁷ Much economic research indicates that the highest sustainable basic income in advanced countries would enable replacing conditional benefits at subsistence level only after a fairly long period of transition (see Van der Veen 1998: sec. 1). If the maximin OS objective endorses the realization of this possibility even in principle – that is, subject to considering the alternative wage-subsidizing policy at its highest sustainable rate – then it must be one that relaxes the demands of backward-looking responsibility.

²⁸ This is shown as follows. First, at a balanced budget and equality of tax revenue under the two policies, the average amount of labor under WS equals b/s^* , with b and s^* the optimal rates of basic income and subsidy at tax rate t^* . Secondly, the crossing point L_c of the budget equations $w_L(\text{BI})(1 - t^*)L + b$ and $w_L(\text{WS})[(1 - t^*) + s^*]L$ equals $L_c = b/[s^* - (w_L(\text{BI}) - w_L(\text{WS}))]$. Since labor is more productive under BI, the crossing point must be somewhat beyond b/s^* .

are under a larger risk of becoming ill or disabled, due to the harsher conditions and the low social status of their work.

I have not attempted here to assess the merits of basic income and wage subsidies in policy settings where these instruments are not supposed to achieve maximin compensation.²⁹ All I have tried to show is that once the main restrictions of the optimal tax model of this paper are relaxed, a case of the following kind can be made. If basic income can be dispensed at subsistence level and if the responsibility-sensitive maximin OS objective supports a degree of income redistribution that includes that dispensation, then the lifetime opportunities of marginal participants in contemporary labor markets are likely to be unnecessarily curtailed, were the government to dispense wage subsidies instead. While this case for basic income depends on the empirical conditions mentioned above, it has the advantage of reducing the undominated policy alternatives to a single one. To the extent that these conditions obtain, there may be no need to study the complex selection problem of sections 3 and 4.1.

APPENDIX 1. UNDOMINATED POLICIES IN REGIME S

In 2.4, the undominated policies of regime S were described informally, with the aid of Figure 2. The underlying results are given here. The optimal tax rate and subsidy of these policies is derived, proceeding from Equation (7) in 2.3, which gives optimal t as a function of parameter L in the objective (6), for a given value of s . In the same way, one obtains the equation for optimal s as a function of L , for a given value of t :

$$(8) \quad s(L, t) = \frac{L - \bar{e}\bar{w}}{2\bar{e}} + \bar{w}t \text{ from (5) and (6).}$$

Two cases must be considered. First, for all values of L in (6) where (7) and (8) intersect at $0 \leq t \leq 1$, $t(L)$ and $s(L)$ are given by:

$$(9) \quad t(L) = \frac{1}{2} + \frac{(\bar{w} - w_L)}{2\bar{e}\sigma_w^2} L$$

$$(10) \quad s(L) = \frac{(p - w_L\bar{w})}{2\bar{e}\sigma_w^2} L$$

When (7) and (8) intersect exactly at $t = 1$, the corresponding value of L is denoted by L_0 . From (9):

$$(11) \quad L_0 = \bar{e}\sigma_w^2 / (\bar{w} - w_L)$$

²⁹ See Van Parijs (1991) and Van der Veen and Groot (2000) for overviews of various aspects of the policy debate.

And from (9) and (10), the subsidy is a linear function of the tax rate for $L \in [0, L_0]$:

$$(12) \quad s(L) = zt(L) - 1/2z \text{ where } z = \frac{(p - w_L \bar{w})}{(\bar{w} - w_L)} = \bar{w} + \frac{\sigma_w^2}{(\bar{w} - w_L)}$$

The second case obtains when L exceeds L_0 . Now (7) and (8) intersect at $t > 1$, outside the upper boundary of the tax rate. Optimal s is solved by substituting $t = 1$ and $L \in (L_0, 1]$ in (8). This gives $s(L) \in (1/2 z, s_{max}]$, with $s_{max} = \text{Min} [1, \bar{w} + (1 - \bar{e}\bar{w})/2\bar{e}]$. Optimal basic income follows from (5). It is governed by the following four propositions.

Proposition 1. Basic income is inversely related to the wage subsidy.

Proof. Since optimal $s(t)$ is kinked at L_0 and B depends on t and s , the derivative dB/ds is undefined at L_0 . It must be shown that $dB/ds < 0$ for other values of L . By definition of the objective, Y_L is maximal for all values of L . Thus the total differential of Y_L is zero, implying $dB/d[w_L(1 - t) + s] = -L$. Rewrite this as $dB/ds: d[w_L(1 - t) + s]/ds = -L$. For $L \in [0, L_0)$, $t < 1$, and from (12) we have $(1 - t) = 1/2 - s/z$. Hence $d[w_L(1 - t) + s]/ds = (z - w_L)/z$. So in this interval of L , $dB/ds = -L(z - w_L)/z < 0$, since $z > w_L$ from (12). For $L \in (L_0, 1]$, $(1 - t) = 0$, and net reward equals s . In this interval, $dB/ds = -L < 0$. ■

Proposition 2. The undominated zero basic income policy exists in regime S, and it is an equal budget policy.

Proof. Basic income is zero if and only if the subsidy absorbs all tax revenue i.e. $B = 0$ iff $s = t\bar{w}$. Imposing this condition on (5) gives $B = 0$ at $t = 0$ and $t = 1$. In regime S, $t = 0$ is a dominated policy, hence the undominated policy with $B = 0$ requires $t = 1$ and $s = \bar{w}$. From (8), $t = 1$ and $s = \bar{w}$ at $L = \bar{e}\bar{w}$. Since L_0 is the lowest value for which $t = 1$, $L_0 \leq \bar{e}\bar{w}$ from (11). Also $\bar{e}\bar{w} < 1$, so the zero basic income policy exists in $L \in [L_0, 1)$. ■

Proposition 3. Unequal budget policies have positive basic income.

Proof. Proposition 2 implies $B = 0$ at $L \geq L_0$. From (12), policies with $t < 1$ have a lower subsidy than the one at L_0 , and from Proposition 1 $B > 0$. ■

In 2.4, the zero basic income was claimed to favor the least advantaged with the average preference:

Proposition 4. The reference preference $\hat{e} = \bar{e}$ selects the zero basic income policy.

Proof. From (4), optimizing for this reference preference requires the undominated policy for which indirect utility $V_{\bar{e}} = 1/2\bar{e}(w_L(1 - t) + s)^2 + B$ is maximized subject to (5). From the proof of Proposition 1 it is verified that for $t < 1$, $V_{\bar{e}}$ is increasing in s , i.e. $d[1/2\bar{e}(w_L(1 - t) + s)^2]/ds > dB/ds$,

using (10) and the restriction $L_0 \leq \bar{e}\bar{w}$ in the proof of Proposition 2. For $t=1$ and $s > 1/2z$, $dV_{\bar{e}}/ds = \bar{e}(\bar{w} - s)$, hence indirect utility is maximized at $s = \bar{w}$, and from Proposition 2 this requires $B = 0$. ■

APPENDIX 2. WEAK LEXIMIN AND BASIC INCOME

Proposition 5. For some parameter values, only the basic income-maximizing policy is selected by weak leximin.

Proof. Take the values of the example in 2.4 ($w_L = .05$, $\bar{w} = .3$, $\sigma_w^2 = .09$ and $\bar{e} = .75$). Proposition 5 requires that the basic income maximizing policy (BI) dominates all policies in regime S, for some $w > w_L$. The proof has two steps.

(1) It is necessary that BI dominates the policy with the largest poll tax (call it PT) for some $w > w_L$. This requires the existence of w_0 ($w_L < w_0 \leq 1$), at which the fulltime incomes of both policies are equal, i.e. $(1 - t^*)w_0 + B^* = s_{max} + B_{min}$. Calculation shows this to be the case for $w_0 = .933$. It now follows that BI dominates all equal budget policies for $w \geq w_0$. Under equal budget policies, fulltime income is independent of w , since $t = 1$. And among these policies, PT is the one with highest fulltime income, because it has lowest basic income, and equal budget policies are undominated for w_L , hence for any w . Therefore fulltime income under BI is at least equal to that of any equal budget policy, implying that BI dominates all equal budget policies for $w \geq w_0$.

(2) It remains to be shown that BI dominates all unequal budget policies for $w \geq w_0$. This will be the case when for $t < 1$, fulltime income is maximized at w_0 under BI, that is, at $L = 0$. This requires $d(w_0(1 - t) + s)/ds + dB/ds = 0$ at $L \leq 0$. From the proof of Proposition 1, $d(w_0(1 - t) + s)/ds = (z - w_0)/z$ and $dB/ds = -L(z - w_L)/z$, for $t < 1$. So the above requirement reduces to $(z - w_0)/(z - w_L) \leq 0$. It is satisfied for the numerical example, with $z = .66$, $w_L = .05$ and $w_0 = .933$. ■

APPENDIX 3. THE AREA METRIC AND BASIC INCOME

Proposition 6. The basic income maximizing policy is ruled out by the maximin area criterion.

Proof. As mentioned in 3.4, the least productive are best off in terms of the area metric if the government selects the undominated policy that maximizes $1/2(w_L(1 - t) + s) + B$. From the proof of Proposition 1 it is inferred that $d[1/2(w_L(1 - t) + s) + B]/ds$ equals $[(z - w_L)/z](1/2 - L)$ for $L \in [0, L_0)$, and equals $(1/2 - L)$ for $L \in (L_0, 1]$. In each case, the derivative is positive at $L = 0$, decreasing in L , and zero for $L = 1/2$, implying that the area is maximal at $L = 1/2$. This rules out the basic income maximizing policy, which requires $L = 0$. If $L_0 > 1/2$, then the area is maximal under some unequal budget policy, and from Proposition 3, basic income is positive. If $L_0 \leq 1/2$, the area is maximal under some equal budget policy.

Since $B = 0$ at $L = \bar{e}\bar{w}$, area-maximizing basic income is negative, zero or positive, depending on whether the maximizing value $L = 1/2$ exceeds, equals or falls short of $\bar{e}\bar{w}$. ■

REFERENCES

- Bensaïd, J. and M. Fleurbaey. 1993. La fiscalité des ensembles de budgets: quelques propositions. *Economie et Prévision*, no. 110–111, 1–22
- Dworkin, R. 2000. *Sovereign Virtue: The Theory and Practice of Equality*. Harvard University Press
- Dworkin, R. 2002. Sovereign virtue revisited. *Ethics*, 113:106–143
- Fleurbaey, M. 1998. Equality among responsible individuals, in: J. F. Laslier, M. Fleurbaey, N. Gravel and A. Trannoy (eds.). *Freedom in Economics: New Perspectives in Normative Analysis*. Routledge, 206–34
- Fleurbaey, M. 2002. Equality of Resources Revisited. *Ethics*, 113:83–105
- Hild, M. and A. Voorhoeve. 2004. Equality of opportunity and opportunity dominance. *Economics and Philosophy*, this issue
- Kreps, D. M. 1979. A representation theorem for “preference for flexibility”. *Econometrica*, 47:565–577
- Parfit, D. 1997. Equality and priority. *Ratio*, 10(3):202–221
- Roemer, J. E. 1998. *Equality of Opportunity*. Harvard University Press
- Topel, R. H. 1997. Factor proportions and relative wages: the supply-side determinants of wage inequality. *Journal of Economic Perspectives*, 11(2):55–74
- Schokkaert, E., D. Van de gaer and F. Vandenbroucke. 2001. Responsibility-sensitive Egalitarianism and Optimal Linear Taxation, unpublished paper, Catholic University of Leuven, Belgium
- Sen, A. 1993. Markets and Freedom. *Oxford Economic Papers* 45:519–541
- Van der Veen, R. J. 1991. *Between Exploitation and Communism. Explorations in the Marxian Theory of Justice and Freedom*. Wolters-Noordhoff
- Van der Veen, R. J. 1997. Real freedom and basic income: comment on Brian Barry. *Journal of Political Philosophy*, 5:274–286
- Van der Veen, R. J. 1998. Real freedom versus reciprocity: competing views on the justice of unconditional basic income. *Political Studies*, 46:140–163
- Van der Veen, R. J. 2002. Equality of talent resources: procedures or outcomes? *Ethics*, 113:55–82
- Van der Veen, R. and L. Groot (eds.). 2000. *Basic Income on the Agenda: Policy Objectives and Political Chances*. Amsterdam University Press
- Van Parijs, Ph. 1987. Inéluçtable, Liberté: note de synthse. Rapport CMID 12 Louvain-la-Neuve, Institut Supérieur de Philosophie
- Van Parijs, Ph. (ed.) 1992. *Arguing for Basic Income, Ethical Foundations for a Radical Reform*. Verso
- Van Parijs, Ph. 1995. *Real Freedom for All. What (if Anything) Can Justify Capitalism?* Clarendon Press
- Van Parijs, Ph. 2003. Hybrid justice, patriotism, and democracy: a selective reply, in A. Reeve and A. Williams (eds.). *Real Libertarianism Reassessed: Political Theory after Van Parijs*. Palgrave 2003, ch. 11
- Vandenbroucke, F. 2001. *Social Justice and Individual Ethics in an Open Society: Equality, Responsibility, and Incentives*. Springer
- White, S. 1997. Liberal equality, exploitation, and the case for an unconditional basic income. *Political Studies*, 45:312–26
- White, S. 1999. The egalitarian earnings subsidy scheme. *British Journal of Political Science*, 29 (4):601–22