The Desirability of Workfare in the Presence of Misreporting

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Abstract

In this paper we demonstrate that in addition to its acknowledged screening role, workfare - namely, introducing work (or training) requirements for welfare eligibility in means-tested programs - also serves to mitigate income misreporting by welfare claimants. It achieves this goal by effectively increasing the marginal cost of earning extra income in the shadow economy for claimants who satisfy the work requirement. We show that when misreporting is sufficiently prevalent, supplementing a means-tested transfer system with work requirements is socially desirable.

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1. Introduction

Work (or training) requirements in means-tested programs (often called “workfare”) have seen resurgence in the past two decades in most OECD countries (OECD 2009).[1] It started in the early 1990s with the US flagship program "Wisconsin Works" emphasizing “work first” strategy, followed by the passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in 1996 that introduced work requirements on a national basis.[2] It then spread, with variations, to other countries, including the Netherlands, the United Kingdom, Denmark, Ireland, Austria, Australia, New Zealand and Israel [OECD (2005)]. For further discussion of workfare amongst other forms of Active Labor Market Policies, see Kluve (2006).

Naturally, work or training requirements may serve to enhance the recipient’s job prospects by allowing the latter to acquire relevant on the job training, work experience and social skills. An additional role played by workfare is in helping the government to screen welfare claimants.[3] The screening role has gained much support during the past two decades, reflecting a strong public sentiment, especially in the US but also in Europe, that welfare should be paid only to those who cannot support themselves [see e.g., Konow (2000) and Fong (2007)].

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[1] The OECD Employment Outlook 2009 suggests, however, shifting somewhat the focus and resources behind activation from the “work-first” approach which tended to dominate prior to the current global economic crisis to a “train-first” approach for those at high risk of long-term unemployment.

[2] The 1996 Act required a minimum of 20 hours of work (or work related activities, such as training) per week to be eligible for a welfare cash transfer. Compliance was assured by an extensive use of sanctions including benefit reductions [for further details see US DHHS (2002)].

[3] Screening is difficult as poor individuals are often characterized by low earning ability and ill health – information that is hard to observe or verify [King (2004)].

The government uses various screening (direct and indirect) devices to overcome these difficulties. These include, inter alia: (1) means testing by reviewing documentation, conducting interviews and testing by specialists; (2) 'tagging' [a la Akerlof (1978)], namely, basing eligibility on observable attributes correlated with ability (e.g., old age, education level, observable disability); (3) offering in-kind transfers that intended beneficiaries would find more attractive (such as wheelchairs) and (4) setting welfare ordeals, namely, adding requirements that undeserving individuals would find relatively costly and, hence, would self-select out of the program [Nichols and Zeckhauser (1982)].

Workfare, even if completely unproductive (when taking the form of work requirement) and utterly useless in its effect on labor market skills (when introduced as a training requirement) can still serve as an effective welfare ordeal for screening purposes. This aspect has been emphasized in two early studies by Besley and Coate [(1992) and (1995)]. They demonstrated that when the government objective is income-maintenance, namely, the government seeks to ensure some minimal level of consumption, introducing work requirements (as a supplement to means-testing) can economize on government costs, even when the work requirements are neither productive nor skill-enhancing. The idea underlying the screening role played by work requirements lies in the fact that as participating in workfare is time-consuming, low-skill individuals incur a lower opportunity cost of participation compared with high-skill ones. Thus, by introducing workfare, the government can enhance the target efficiency of the welfare program. Clearly, as Besley and Coate (1995) indeed show, this conclusion hinges crucially on the government specified objective of income maintenance in which case the government ignores the disutility (associated with forgone leisure) suffered by individuals from working and/or participating in training programs. However, when the government objective is welfarist, namely, when these costs are taken into the social calculus, Besley and Coate demonstrate that workfare becomes undesirable.[4]

Subsequent literature, revisiting the early results of Besley and Coate, demonstrated that workfare may be desirable even when the government accounts for disutility from labor. Cuff (2000) argues that when high-disutility from labor is attributed to "laziness," targeting benefits to the deserving (non-lazy) poor, namely, low-skill individuals who incur low disutility from labor (as opposed to undeserving claimants who incur high-disutility from labor), warrants imposing non-productive workfare on welfare claimants, which serves to distinguish between the deserving poor and the undeserving ones. Moffitt (2006) makes a case for workfare by assigning an intrinsic value to work provided by sufficiently able individuals amongst welfare claimants, thereby capturing a perception that work is important *per se*. Brett (1998) and (2005) takes a different direction, by relaxing the assumption regarding workfare being completely unproductive, and characterizes conditions under which incorporating productive work requirements into the welfare system turns out to be socially desirable.

[4] Examining the case for workfare as a supplement to means-testing, Besley and Coate acknowledge, however, that when means-testing is infeasible due to inability to observe income, as in the case of least-developed countries, where it is prohibitively costly for the government to obtain information about individuals' income, workfare can be justified even when invoking a welfarist objective. In such a case, means-testing is rendered an ineffective screening tool and, workfare substitutes means-testing as a screening device. Our argument, in contrast, applies to welfare systems that do rely on means-testing, as is the case in most countries of the world, including the vast majority of developing countries. We argue that a major role played by workfare, in addition to screening, is in enhancing the effectiveness of means-testing. That is, we emphasize the essential complementary role played by workfare.

In this paper we contribute to the above strand in the literature by arguing that in addition to its acknowledged screening role, workfare has another important function. It serves to mitigate misreporting by welfare claimants who work in the shadow economy and falsify their income to gain eligibility for means-tested transfers. It achieves this goal by effectively increasing the marginal cost of earning extra income in the shadow economy for claimants who satisfy the work requirement, as the marginal disutility from labor is rising and the hours spent working in the shadow economy come on top of those spent on satisfying the work requirements. By reducing the extent of misreporting, the introduction of workfare serves to enhance the effectiveness of means-testing as a screening device. We show that when misreporting is sufficiently prevalent, supplementing a means-tested transfer system with work requirements is socially desirable.

Our paper emphasizes the role of workfare in augmenting means-testing as a screening device, but it also contributes to the strand in the optimal tax literature that examines the design of tax-and-transfer systems in the presence of tax evasion [see, e.g., Cremer and Gavhari (1996)]. This literature usually focuses on enforcement through the probability of detection and the penalty function. We demonstrate the potential role of workfare in reducing the extent of misreporting. Acknowledging the role of workfare in mitigating the extent of misreporting is highly relevant for policy design in light of the fact that welfare fraud is very significant in the US and in most other countries, and misreporting of income is the leading form of welfare fraud [Wolf and Greenberg (1986); Burtless (1986); Luna (1997); Romanov and Zussman (2001); and Martinelli and Parker (2009)]. There is widespread concern about the abuse of welfare programs but accurate assessments are difficult to find and the issue has gained only modest attention in the public finance literature [Yaniv (1997)]. The issue is closely related to that of the underground economy as a whole [see Schneider and Enste (2000) and Schneider (2007) for broad surveys of 145 countries]. Misreporting of income is especially prevalent in developing countries but is significant in developed countries as well.[5] For example, the US Treasury estimated the gross federal tax gap for 2001 at $ 345 billion, not including income generated in criminal activity [IRS (2007)]. The following two famous anecdotes can give us a sense of what is at stake. In 1987 the number of dependent (e.g., children) exemption allowances claimed by US taxpayers fell by 7 million (!) following the introduction of a new requirement to report the dependent's Social Security number [Szilagyi (1990)]. Similarly, the number of taxpayers claiming child-care credits dropped from 8.7 million in 1988 to 6 million in 1989 following the introduction of a new requirement to provide the details of the care provider.

The structure of the paper is as follows. In the coming section we introduce a simple analytical framework. In section 3 we introduce the government problem. In section 4 we derive the properties of the social optimum. Section 5 concludes.

2. The Model

Consider an economy with a continuum of individuals who differ in their innate earning ability, denoted by w. We assume that the targeted population consists of two types of individuals: low-ability and high-ability individuals, whose earning abilities are

[5] See discussion in footnote 4.

respectively denoted by $\underline{w}$ and $\overline{w}$, with $\overline{w} > \underline{w} > 0$. There are in fact more than just two types in the economy, but we assume that these other types are of higher skills and none of them apply for welfare benefits. Taxing these higher-skill types would serve to finance the benefits claimed by the two types we consider explicitly. We simplify by assuming that the two ability groups in question are of equal size, normalized to unity.[6] We further assume that the production technology (of the single consumption good, which price is normalized to unity) exhibits constant returns to scale and perfect substitution between the two skill levels. Assuming a competitive labor market, it follows that *w* denotes the wage rate of a *w*-type individual. We follow Mirrlees (1971) by assuming that earning abilities are private information, unobserved by the government, thus restricting ourselves to second best re-distributive policy rules.

Following Besley and Coate [(1992) and (1995)] and Diamond (1998) we assume that individuals' preferences are represented by a quasi-linear utility function:

(1) $$U(c,l,d,\alpha) = c - h(l) - \alpha \cdot d\,,$$

where *c* denotes consumption, *l* denotes the time allocated to non-leisure activities (such as work, training, workfare, etc.), *h* is strictly increasing and strictly convex and *d* is an indicator function which assumes the value of one, if the individual is cheating the welfare agency (that is, misreporting her income in order to be eligible for some transfer) and zero otherwise.[7] The parameter α denotes the individual cost associated with cheating measured in consumption terms. This parameter reflects the moral (psychic)

[6] This assumption does not affect the qualitative nature of our results.

[7] Misreporting may take different forms. One plausible interpretation is that welfare claimants work in the shadow economy in addition to holding low-paying jobs in the legal sector (based on which they claim eligibility for welfare transfers).

costs entailed by misreporting, possibly attributed to stigma or to guilt feelings [see Cahuc and Algan (2009) for similar application in the context of unemployment insurance]. We plausibly assume that α varies across individuals. For concreteness we simplify by assuming that α is uniformly distributed over the support $[0,\overline{\alpha}]$ for both types of individuals. Notice that in the limiting case where $\overline{\alpha} \to \infty$, there is no-misreporting; namely, the set of cheaters is of zero measure (the standard case examined by the literature which would serve as a benchmark for our analysis).

The government is seeking to ensure a minimal standard of well-being for all individuals, denoted by some pre-specified utility level, $\hat{u}$. Denoting by $\overline{V}$ and $\underline{V}$, the utility levels derived by a low-ability and a high-ability individuals, respectively, in the absence of government intervention,[8] we assume that $\underline{V} < \hat{u} \leq \overline{V}$. In words, the high-ability individuals attain by themselves a (weakly) higher level of well-being than the minimal threshold set by the government, whereas the low-ability individuals can only achieve this level of well-being with government assistance.

In order to achieve the utility maintenance goal defined above, the government is offering means-tested (non-negative) transfers (we are thus considering a welfare maintenance program and <u>not</u> an income tax) supplemented by work requirements (workfare). The individuals choose whether to apply, at all, for benefits. In case they choose to apply, claimants participate in the workfare program. The level of transfer is determined based on their reported (not necessarily truthfully) level of income. Naturally,

[8] Formally, $\overline{V} = \max_y [y - h(y/\overline{w})]$ and $\underline{V} = \max_y [y - h(y/\underline{w})]$, with y denoting the level of income given by $y = w \cdot l$.

the government may induce the agents to report truthfully by an appropriate choice of detection probabilities and fines (or may otherwise, in certain circumstances, be able to verify the true level of income directly), but as we focus on the role of workfare in addressing the issue of misreporting, we simplify by assuming that the transfers are made conditional on reported income and reported income is not verifiable.

3. The Government Program

The government offers transfers based on reported levels of income so as to ensure the pre-specified level of well-being at minimum cost. Note that the utility cost of misreporting, αd, does not depend on the extent of misreporting but rather only on the decision whether to misreport or not. Therefore, all individuals that decide to misreport will choose to report that level of income which makes them entitled to the highest level of transfer. This is true for both skill levels. As there are only two skill levels, it follows that there will be at most three reported levels of income: the true income of a low-skill individual, the true income of a high-skill one and the income level reported by "cheaters" (of both types). Thus, we can confine attention to transfer schedules that consist of only three different income-dependent transfers.

In fact, we can further restrict ourselves to schedules with only two income-dependent transfers. To see this, consider a presumably optimal schedule with three different income-dependent transfers (with all three levels of income being actually reported, to avoid trivial cases). Naturally, cheaters will report that income level which entails the highest transfer. Therefore, by construction, the two other levels of income (and associated transfers) must be chosen by high-skill and low-skill non-cheaters. Notice, that by construction, both the high-skill and the low-skill non-cheaters will attain a utility level (weakly) exceeding the target threshold set by the government. The government can do better (relative to the presumed optimal schedule described above) by eliminating the highest transfer (that is, the income-transfer bundle chosen by cheaters) from the offered schedule. This will certainly cut the cost of the program and at the same time maintain the pre-specified level of (target) utility for both types of individuals. We thus restrict attention to schedules consisting of only two income-dependent transfers.

Denote by $\underline{y}$ (respectively, $\overline{y}$) the income level reported by low- (respectively, high) skill non-cheating individuals.[9] The transfers are such that those reporting an income of $\underline{y}$ (respectively, $\overline{y}$) enjoy a consumption level of $\underline{c}$ (respectively, $\overline{c}$). In other words, the transfers offered to those reporting an income of $\underline{y}$ (respectively, $\overline{y}$) are given by $\underline{c}-\underline{y}$ (respectively, $\overline{c}-\overline{y}$). As the government aims to raise the well-being of the low-skill individuals, it follows that $\underline{c}-\underline{y} \geq \overline{c}-\overline{y}$, so that all cheaters will choose to report an income level of $\underline{y}$. Note, that all low-skill individuals, irrespective of whether or not they misreport their income, receive the same transfer, $\underline{c}-\underline{y}$. Thus, the cost of the transfer program depends only on how many high-skill individuals choose to cheat (and, naturally, on the two levels of transfer). Note also that as the disutility from misreporting rises with respect to α, it follows that there will be a cutoff level of α, denoted by α_0,

[9] With no loss in generality we can assume that the high-skill individual participates in the program. This follows, as we can always treat a program in which the high-skill individual does not participate, as one which offers a zero transfer at her laissez-faire choice of income.

such that all high-skill individuals with α below α_0 will choose to cheat and all other high-skill individuals will truthfully report their income ($0 \leq \alpha_0 \leq \overline{\alpha}$). Recalling that α is uniformly distributed over the interval $[0, \overline{\alpha}]$, it follows that $\alpha_0 / \overline{\alpha}$ measures the number of high-skill cheaters. Hence, the cost of the transfer program to the government is given by:

(2) $$E \equiv (1 + \alpha_0 / \overline{\alpha}) \cdot (\underline{c} - \underline{y}) + (1 - \alpha_0 / \overline{\alpha}) \cdot (\overline{c} - \overline{y}).$$

We further assume that in order to be eligible for the <u>high</u> transfer the individual must not only satisfy the means-testing (reporting an income level of $\underline{y}$), but also abide by a work requirement (workfare). Denote by Δ the work requirement set by the government, measured in hours. Following Besley and Coate (1992) and (1995), we assume that the workfare requirement serves for screening purposes only and does not affect the productivity of the individuals. By doing so, we attempt to establish a case for workfare under the most unfavorable circumstances where workfare entails a pure deadweight loss.

The government is seeking to minimize the cost given by equation (2), by choosing the 6-tuple $< \overline{y}, \overline{c}, \underline{y}, \underline{c}, \alpha_0, \Delta >$ subject to the following constraints:

(3) $$\underline{c} - h[(\underline{y} / \underline{w}) + \Delta] \geq \hat{u} ,$$

(4) $$\overline{c} - h(\overline{y} / \overline{w}) \geq \overline{V} ,$$

(5) $$\overline{c} - h(\overline{y} / \overline{w}) \geq \underline{c} - h[(\underline{y} / \overline{w}) + \Delta],$$

(6) $$\underline{c} - h[(\underline{y} / \underline{w}) + \Delta] \geq \overline{c} - h(\overline{y} / \underline{w})$$

(7) $\underline{c}-\underline{y}+\overline{\overline{V}}(\Delta)-\alpha_0=\overline{c}-h(\overline{y}/\overline{w})$,

where $\overline{\overline{V}}(\Delta)=\max_y\left[y-h[(y/\overline{w})+\Delta]\right]$.

We turn next to interpret the constraints (3)-(7). The first constraint [condition (3)] ensures that the transfers are set so as to achieve the goal of attaining the pre-specified level of utility, $\hat{u}$. As was already explained, we assume with no loss of generality that high-skill individuals participate in the program. This is reflected in condition (4). Conditions (5) and (6) are the standard self-selection (incentive compatibility/no-mimicking) constraints for the high-ability and low-ability non-cheaters, respectively. The conditions state that each type is as well-off with her own bundle as she would be by pretending to be (mimicking) the other type. Notice that in order to be eligible for the transfer designed for the low-ability type (given by $\underline{c}-\underline{y}$) an individual has to satisfy both an income test (the reported income level has to be $\underline{y}$) and abide by the work requirement (a training period which lasts Δ hours). The final constraint [condition (7)] determines the level of misreporting in equilibrium. A high-ability individual with moral cost α_0 is just indifferent between truthfully reporting his income ($\overline{y}$), thereby receiving the transfer $\overline{c}-\overline{y}$, which provides him with the level of utility given by the expression on the right-hand side of (7); and misreporting, that is pretending to earn (reporting) $\underline{y}$, participating in the workfare program, thus being entitled to the transfer $\underline{c}-\underline{y}$, but actually choosing to earn an (optimal) different level of income, $\overline{\overline{y}}=\arg\max_y\left[y-h[(y/\overline{w})+\Delta]\right]$, thereby attaining the level of utility given by the expression on the left-hand side of equation (7). Evidently, all those high-ability individuals whose α is below α_0 will choose to misreport.[10] Note, that as we assumed, with no loss of generality, that all individuals participate in the program, it follows that there is no need to introduce non-negativity constraints on the transfers.

Consider as a benchmark the Besley and Coate [(1992), (1995)] model in which there is no misreporting. In our model this amounts to letting $\overline{\alpha} \to \infty$. We will plausibly assume that there is some (but not an excessive level of) misreporting. That is, we will assume that $\overline{\alpha}$ is sufficiently high but finite (see the appendix for a formal condition). Also, note that when the desired minimal level of utility, $\hat{u}$, is sufficiently small (close to $\underline{V}$), then the re-distributive policy is relatively easy to attain and is therefore of limited interest. Indeed, in this case, and in the absence of misreporting, the government can attain its objective without causing any distortion.[11] We will therefore consider the plausible case of $\hat{u}$ being sufficiently high (see the appendix for a formal condition).

We turn next to examine which of the inequality constraints (3)-(6) is binding in the optimal solution. Clearly, a cost-minded government would never choose to offer a level of transfer exceeding what is required to attain the pre-specified utility level, $\hat{u}$; so

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[10] Notice, that there are, naturally, also low-ability individuals who will choose to misreport in equilibrium (those with least moral inhibitions; namely, those incurring the lowest moral costs). However, as low-ability individuals are in any case entitled to the larger level of benefit, $\underline{c} - \underline{y}$, this will not affect the government objective and optimization considerations. Notice further, that by revealed preference considerations, those individuals who choose to misreport will derive a higher level of utility than that derived by those individuals who report truthfully, thus the individual rationality (voluntary participation) condition will be satisfied and the level of utility will exceed the minimal threshold set by the government also for those who misreport.

[11] To see this, note that the government can set $\underline{y}$ and $\overline{y}$ at their *laissez faire* levels, $\overline{c} = \overline{y}$ and set $\underline{c} > \underline{y}$ to attain the minimal utility goal. As, by revealed preference, the high-skill individual strictly prefers her (*laissez faire)* bundle to the (*laissez faire)* bundle chosen by the low-skill individual, it follows by continuity that when the desired minimum level is small enough, that is when $\underline{c}$ is sufficiently close to $\underline{y}$, the self-selection constraint of the high-skill individual will be satisfied and there will be no reason to introduce distortions (in order to mitigate this constraint).

that it is straightforward to show that constraint (3) is binding. Turning next to condition (4), we can show (see the appendix for details) that this constraint is not binding when the pre-specified utility level, $\hat{u}$, is sufficiently large, as we indeed assume. We finally turn to the two incentive compatibility constraints given by the conditions in (5) and (6). First note that by the single crossing property of the individuals' indifference curves (which follows from the convexity of *h*), both constraints cannot simultaneously bind. The natural conjecture would be that the incentive constraint of the high-ability type will bind in the optimal solution. We can indeed confirm this conjecture (see the appendix for details) under our assumption that $\overline{\alpha}$ is sufficiently large.

Summarizing: constraints (3) and (5) are binding, whereas, constraints (4) and (6) are not binding, hence, dropped out when deriving the properties of the optimal solution.

4. Characterization of the Optimal Program

We suppose first that the workfare requirement (namely, Δ) is fixed and derive the first-order conditions for the optimal solution. Let λ, μ and η denote the multipliers associated with the binding inequality constraints (3) and (5), and the equality constraint (7), respectively. The *Lagrangean* expression is then given by:

$$\begin{aligned} L(\Delta) \equiv {} & (1+\alpha_0/\overline{\alpha})\cdot(\underline{c}-\underline{y}) + (1-\alpha_0/\overline{\alpha})\cdot(\overline{c}-\overline{y}) - \lambda\cdot[\underline{c}-h(\underline{y}/\underline{w}+\Delta)-\hat{u}] \\ & -\mu\cdot[\overline{c}-h(\overline{y}/\overline{w})-\underline{c}+h(\underline{y}/\overline{w}+\Delta)] - \eta\cdot[\underline{c}-\underline{y}+\overline{\overline{V}}(\Delta)-\alpha_0-\overline{c}+h(\overline{y}/\overline{w})]. \end{aligned} \tag{8}$$

The first-order conditions are given by:

(9) $\partial L / \partial \bar{c} = (1 - \alpha_0 / \bar{\alpha}) - \mu + \eta = 0,$

(10) $\partial L / \partial \bar{y} = -(1 - \alpha_0 / \bar{\alpha}) + \mu \cdot h'(\bar{y} / \bar{w}) / \bar{w} - \eta \cdot h'(\bar{y} / \bar{w}) / \bar{w} = 0,$

(11) $\partial L / \partial \underline{c} = (1 + \alpha_0 / \bar{\alpha}) - \lambda + \mu - \eta = 0,$

(12) $\partial L / \partial \underline{y} = -(1 + \alpha_0 / \bar{\alpha}) + \lambda \cdot h'(\underline{y} / \underline{w}) / \underline{w} - \mu \cdot h'(\underline{y} / \bar{w}) / \bar{w} + \eta = 0,$

(13) $\partial L / \partial \alpha_0 = [(\underline{c} - \underline{y}) - (\bar{c} - \bar{y})] / \bar{\alpha} + \eta = 0.$

Employing the first-order conditions in (9)-(13) one can obtain the standard properties derived by the literature; namely, a zero (implicit) marginal tax rate levied on the high-skill individual [‘efficiency at the top’, see Sadka (1976)] and a strictly positive (implicit) marginal tax rate imposed on the low-skill individual (see the appendix for details).

We turn next to examine the desirability of imposing a workfare requirement (as a supplement to means-testing). Specifically, we ask whether imposing some workfare requirement is better than none. To do this, we employ the envelope theorem and differentiate the *Lagrangean* with respect to Δ, evaluating the derivative at $\Delta = 0$:

(14) $\partial L / \partial \Delta \big|_{\Delta=0} = \lambda \cdot h'(\underline{y} / \underline{w}) - \mu \cdot h'(\underline{y} / \bar{w}) - \eta \cdot \partial \bar{\bar{V}} / \partial \Delta \big|_{\Delta=0} .$

The expression on the right-hand side of equation (14) captures the different channels via which imposing workfare affects total government cost. The first term is positive, hence works in the direction of increasing government cost. It measures the increase in the transfer paid to a low-skill non-cheating claimant necessary to compensate her for the additional disutility entailed by the imposition of the work requirement, in order to maintain the target utility set by the government. The second term is negative, hence works in the direction of reducing government cost. It measures the screening gain from introducing workfare; namely, the reduction in the transfer paid to the high-skill non-cheating claimant, due to the slackening of his (binding) incentive constraint. The third term is negative, hence works in the direction of reducing government cost. This term is unique to our setting and captures the gain from introducing workfare as a means to reduce the extent of income misreporting by high-skill cheating claimants.

When the expression in (14) is negative, imposing some workfare requirement is desirable, as it results in a reduction in government expenditure. This turns out to be indeed the case when the underlying skill-gap is large and cheating is not viewed as highly immoral:

Proposition: There exist w_0 and $\overline{\alpha}_0$ such that workfare is a socially desirable supplement to income-testing for all $\overline{w}/\underline{w} > w_0$ and $\overline{\alpha} < \overline{\alpha}_0$.

Proof: See the appendix. QED

The rationale underlying our result is as follows. When the skill gap is large, a workfare requirement can serve as an effective screening device, as it is much more costly for the high-ability individuals to take part in these programs relative to low-ability ones. However, workfare programs entail a large deadweight loss (in light of our assumption that they serve purely for screening purposes). The previous literature has not taken into account the phenomenon of income-misreporting by welfare claimants. In the absence of misreporting it was shown that when income testing is employed for screening purposes, there is no desirable supplementary role played by workfare. However, when agents can misreport their income thereby rendering the income testing less effective, workfare can serve to mitigate the high-ability individuals' incentive to misreport. Put differently, workfare makes it more costly for high-ability individuals to misreport, thereby enhancing the effectiveness of income-testing.

5. Conclusion

In this paper we demonstrate that in addition to its acknowledged screening role, workfare has another important function. It serves to mitigate misreporting by welfare claimants who work in the shadow economy and falsify their income to gain eligibility for means-tested transfers. It achieves this goal by effectively increasing the marginal cost of earning extra income in the shadow economy for claimants who abide by the work requirement. By reducing the extent of misreporting, introducing workfare serves to enhance the effectiveness of means-testing as a screening device. We show that when misreporting is sufficiently prevalent, supplementing a means-tested transfer system with work requirements is socially desirable.

References

Algan, Y. and P. Cahuc (2009) "Civic Virtue and Labor Market Institutions," American Economic Journal: Macroeconomics 1:1, 111-145.

Akerlof, G. (1978) "The Economics of Tagging as Applied to the Optimal Income Tax," American Economic Review 68, 8-19.

Besley, T. and S. Coate (1992) "Workfare versus Welfare Incentive Arguments for Work Requirements in Poverty-Alleviation Programs", American Economic Review 82, 249-61.

---- (1995) "The Design of Income Maintenance Programs", Review of Economic Studies 62, 187-221.

Brett, C. (1998) "Who Should Be on Workfare? The Use of Work Requirements as Part of the Optimal Tax Mix," Oxford Economic Papers 50, 607-622.

---- (2005) "Bunching, Time Constraints, and Workfare," Journal of Public Economic Theory 7, 93-105.

Burtless G. (1986) "The Work Response to Guaranteed Income: A Survey of Experimental Evidence," in Munnell, A.H. (ed.), Lessons from the Income Maintenance Experiments, Federal Reserve Bank of Boston and The Brookings Institution, pp. 22-52.

Cremer, H. and F. Gahvari (1996) "Tax Evasion and the Optimum General Income Tax," Journal of Public Economics, 60(2), 235-49.

Cuff, K. (2000) “Optimality of Workfare with Heterogeneous Preferences”, Canadian Journal of Economics, 33, 149-174

Fong, C. (2007) "Evidence from an Experiment on Charity to Welfare Recipients: Reciprocity, Altruism and the Empathic Responsiveness Hypothesis," Economic Journal 117(522), 1008-1024.

Internal Revenue Service and U.S. Dep't of the Treasury (2007) "Reducing the Tax Gap: A Report on Improving Voluntary Compliance".

King, J. (2004) “Impediments to Gainful Employment,” Social Security Journal 66, 9-34.

Kluve, J. (2006) “The Effectiveness of European Active Labor Market Policy,” IZA Disc. Paper 2018.

Konow, J. (2000) "Fair Shares: Accountability and Cognitive Dissonance inAllocation Decisions," American Economic Review 90(4), 1072-1091.

Luna, E. (1997) "Welfare Fraud and the Fourth Amendment" 24 Pepperdine L. Rev. 1235, 1250.

Martinelli, C. and S. Parker (2009) "Deception and Misreporting in a Social Program," Journal of the European Economic Association 7(4): 886-908.

Mirrlees, J. (1971) "An Exploration in the Theory of Optimum Income Taxation", Review of Economic Studies, 38, 175-208

Moffitt, R. (2006) "Welfare work Requirements with Paternalistic Government Preferences," Economic Journal, Royal Economic Society, 116(515), F441-F458.

Nichols, A. and R. Zeckhauser (1982) “Targeting Transfers Through Restrictions on Recipients”, American Economic Review, 72(2), 372-377.

OECD (2005) OECD Employment Outlook, OECD: Paris.

OECD (2009) Employment Outlook 2009: Tackling the Jobs Crisis, OECD: Paris.

Romanov, D. and N. Zussman (2001) "Income Maintenance and its Effects on Labor Supply and Income Misreporting," Economics Quarterly 48:607-646.

Sadka, E. (1976) “On Income Distribution, Incentive Effects and Optimal Income Taxation,” Review of Economic Studies, 43, 261-268.

Salanie, B. (2003) “The Economics of Taxation”, The MIT Press, Cambridge, Mass.

Schneider, F. (2007) "Shadow Economies and Corruption all over the World: New Estimates for 145 Countries," The Open Access - Open Assessment, E-Journal No. 2007-09.

Schneider, F. and D. Enste (2000) "Shadow Economies: Size, Causes, and Consequences," Journal of Economic Literature 38, 77-114.

Szilagyi, J. (1990) "Where Have All The Dependents Gone?," in IRS, 1990 Update: Trend Analyses and Related Statistics.

U.S. Department of Health and Human Services (2002) "TANF: Fourth Annual Report to Congress," Washington: Administration for Children and Families.

Wolf, D. and D. Greenberg (1986) "The Dynamics of Welfare Fraud," Journal of Human Resources 21, 437-455.

Yaniv, G. (1997) "Welfare Fraud and Welfare Stigma," Journal of Economic Psychology 18, 435-451.

Appendix: Proofs

Proof that constraint (4) is non-binding in the optimal solution

Let $\hat{u} = \overline{V}$. By virtue of (3), it follows that $\underline{c} - h(\underline{y} / \underline{w} + \Delta) \geq \overline{V}$. Thus, $\underline{c} - h(\underline{y} / \overline{w} + \Delta) > \overline{V}$; hence, by virtue of (5), $\overline{c} - h(\overline{y} / \overline{w}) > \overline{V}$. It follows that the constraint in (4) is satisfied as a strict inequality. By continuity considerations, the result extends to values of $\hat{u}$ sufficiently close to $\overline{V}$. This completes the proof. QED

Proof that constraint (5) is binding in the optimal solution

Consider first the benchmark case in the absence of misreporting; namely, when $\overline{\alpha} \to \infty$. In this case we can ignore constraint (7), as the set of individuals who misreport is of zero measure. Suppose by way of contradiction that constraint (5) is not binding. Thus, as constraint (4) is also non-binding (as shown above), then by continuity considerations, one can slightly reduce the level of $\overline{c}$ without violating any of the constraints (4) and (5). Notice that by reducing the level of $\overline{c}$ none of the other two constraints [(3) and (6)] is violated either. This slight modification will economize on government expenditure and attain the desired contradiction to the presumed optimality. Consider next the case where a non-zero measure of individuals is misreporting. A reduction in $\overline{c}$ would have two effects on government expenditure, a mechanical effect and a behavioral one. As in the previous case with no misreporting, a reduction in $\overline{c}$ would lower the level of government expenditure. However, as can be observed from condition (7), the number of high-ability individuals who misreport would then adjust in equilibrium. In particular, α_0 will increase (that is the number of individuals who misreport will increase). This will result in a corresponding increase in government expenditure, which may all in all increase overall government expenditure. To see why an increase in α_0 will increase the government expenditure (other things equal), note that in the optimal solution it is necessarily the case, that $\underline{c} - \underline{y} \geq \overline{c} - \overline{y}$. If it were not the case, one could replace the presumably optimal program with a universal system that would offer all agents a lump-sum transfer equal to $\underline{c} - \underline{y}$, which would trivially satisfy all constraints and reduce total government expenditure. Then, it follows from the objective in equation (2) that when the system is indeed means-tested (that is $\underline{c} - \underline{y} > \overline{c} - \overline{y}$), an increase in α_0 does increase total government expenditure.

The overall impact on government expenditure of the combined mechanical and behavioral effect is generally ambiguous. However, our result in the case of no misreporting extends by continuity consideration to the case where the level of misreporting is sufficiently small, that is $\overline{\alpha}$ is sufficiently large. In this case the mechanical effect would prevail.

We will show below that a sufficient condition for the incentive constraint in (5) to be binding in the optimal solution for the government problem is the following:

$\overline{\alpha} \geq 2 \cdot \left[[\overline{y} - h(\overline{y} / \overline{w})] - [\underline{y} - h(\underline{y} / \overline{w})] \right]$, where $\overline{y}$ and $\underline{y}$ denote the levels of income chosen by a high-skill and low-skill individuals, respectively, under *laissez-faire*.

Signing the Optimal Marginal Tax rates

Substituting for the term $(1-\alpha_0/\overline{\alpha})$ from (9) into (10) and re-arranging yields:

(A1) $\quad h'(\overline{y}/\overline{w}) = \overline{w}$.

Thus, we obtain the standard 'efficiency at the top' result.

Substituting for the term $\alpha_0/\overline{\alpha}$ from (11) into (12) and re-arranging yields:

(A2) $\quad h'(\underline{y}/\underline{w})/\underline{w} = 1-\mu/\lambda\cdot[1-h'(\underline{y}/\overline{w})/\overline{w}]$.

By virtue of the single crossing property and the fact that the incentive constraint of high-skill individual [constraint (5)] is binding, $\overline{y} > \underline{y}$. Hence by virtue of (A1) and the convexity of *h*, $h'(\underline{y}/\overline{w})/\overline{w} < 1$. It follows that $h'(\underline{y}/\underline{w})/\underline{w} \leq 1$ (with strict inequality when $\mu > 0$). Thus, the (implicit) marginal tax rate levied on the low-skill individual is strictly positive.

Proof of the Proposition

The construction of the proof will be in three stages.

Stage I

We first turn to simplify the expression in (14), which is reproduced for convenience:

(A3) $\quad \partial L/\partial\Delta\big|_{\Delta=0} = \lambda\cdot h'(\underline{y}/\underline{w}) - \mu\cdot h'(\underline{y}/\overline{w}) - \eta\cdot\partial\overline{\overline{V}}/\partial\Delta\big|_{\Delta=0}$.

Substituting for the term ($\mu - \eta$) from (9) into (11) and re-arranging yields:

(A4) $\lambda = 2$.

By the definition of $\overline{\overline{V}}(0)$ and by virtue of (A1) it follows that $\overline{\overline{V}}(0) = \overline{y} - h(\overline{y} / \overline{w})$. Substituting into (7) and re-arranging yields then:

(A5) $\alpha_0 = (\underline{c} - \underline{y}) - (\overline{c} - \overline{y})$.

Substituting into (13) yields:

(A6) $\eta = -\alpha_0 / \overline{\alpha}$.

Employing (A4) and (A6) to simplify (11) yields:

(A7) $\mu = 1 - 2\alpha_0 / \overline{\alpha}$.

Differentiating $\overline{\overline{V}}$ with respect to Δ, employing the envelope theorem, yields:

(A8) $\partial \overline{\overline{V}} / \partial \Delta \big|_{\Delta=0} = -\overline{w}$.

Substituting into the expression in (14) yields:

(A9) $\partial L / \partial \Delta \big|_{\Delta=0} = \lambda \cdot h'(\underline{y} / \underline{w}) - \mu \cdot h'(\underline{y} / \overline{w}) + \eta \cdot \overline{w}$.

Finally, by employing conditions (12), (A4), (A6) and (A7), following some algebraic manipulations, one can obtain the following simplified form of the expression in (A9):

(A10) $\partial L / \partial \Delta \big|_{\Delta=0} = \overline{w} \cdot (1 + \alpha_0 / \overline{\alpha}) - 2 \cdot (\overline{w} / \underline{w} - 1) \cdot h'(\underline{y} / \underline{w})$.

Stage II

We next derive two useful properties of the optimal system that will be employed in what follows. In order to prove these properties we make an additional technical assumption that $h''' \geq 0$. Notice that when h takes an iso-elastic functional form, the assumption implies that the (constant) elasticity of labor supply is bounded above by unity, which is consistent with existing empirical evidence [see, e.g., Salanie (2003)].

Lemma: (i) $\partial(\alpha_0 / \overline{\alpha}) / \partial \overline{\alpha} < 0$, (ii) $\partial \underline{y} / \partial \overline{\alpha} < 0$.

Proof:

(i) Substituting for λ, η and μ from (A4), (A6) and (A7) into (12) and re-arranging yields the following simplified expression:

(A11) $$h'(\underline{y}/\underline{w})/\underline{w} = 1 + \frac{(1-2\alpha_0/\overline{\alpha}) \cdot [h'(\underline{y}/\overline{w})/\overline{w} - h'(\underline{y}/\underline{w})/\underline{w}]}{(1+2\alpha_0/\overline{\alpha})}.$$

Fully differentiating the expression in (A11) with respect to $\overline{\alpha}$ and re-arranging yields:

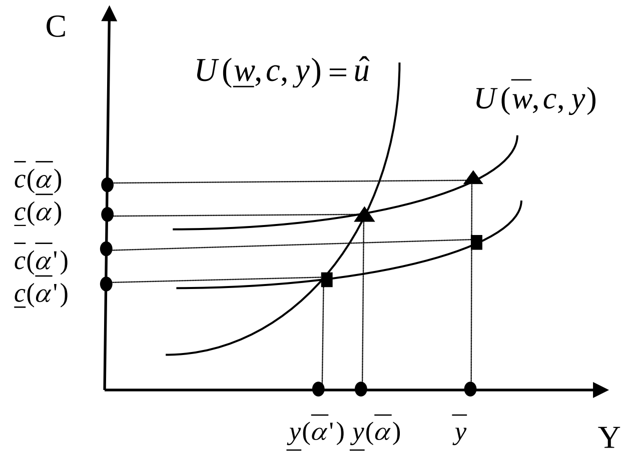
(A12)

$$h''(\underline{y}/\underline{w})/\underline{w}^2 \cdot \partial \underline{y} / \partial \overline{\alpha} =$$

$$\frac{\left[\left[-4\frac{\partial(\alpha_0/\overline{\alpha})}{\partial \overline{\alpha}} \cdot [h'(\underline{y}/\overline{w})/\overline{w} - h'(\underline{y}/\underline{w})/\underline{w}]\right] + \left[(1-4\alpha_0^2/\overline{\alpha}^2) \cdot [h''(\underline{y}/\overline{w})/\overline{w}^2 - h''(\underline{y}/\underline{w})/\underline{w}^2] \cdot \partial \underline{y} / \partial \overline{\alpha}\right]\right]}{(1+2\alpha_0/\overline{\alpha})^2}$$

Now suppose by way of contradiction that $\partial(\alpha_0/\overline{\alpha})/\partial\overline{\alpha} > 0$. Then, as h is convex, $h''' \geq 0$, by assumption, and $\alpha_0/\overline{\alpha} \leq 1/2$, by our earlier derivations, it follows that $\partial \underline{y}/\partial\overline{\alpha} > 0$, otherwise, it is straightforward to verify that the right-hand side of the expression in (A12) is positively signed, whereas, the left-hand side is negatively signed. Now consider the figure below, which depicts the optimal solution for the government program in the net-income - gross-income (c, y) space. We denote by $U(w,c,y) \equiv c - h(y/w)$, the utility derived by an individual of type w with gross income y and net income c. Note first that by the convexity of h, the single crossing property holds and in particular, the indifference curve of the low-ability type is steeper than that of the high-ability type [the slope of the indifference curve is given by $MRS(w) = h'(y/w)/w$]. By virtue of our earlier derivations, conditions (3) and (5) are binding in the optimal solution. Fixing the initial level of $\overline{\alpha}$, the equilibrium is given by the two bundles depicted as triangles in the figure. Now consider a downward shift in $\overline{\alpha}$; namely $\overline{\alpha}' < \overline{\alpha}$. By virtue of our presumption, $\underline{y}(\overline{\alpha}') < \underline{y}(\overline{\alpha})$ and $\alpha_0'/\overline{\alpha}' < \alpha_0/\overline{\alpha}$, hence, $\alpha_0' < \alpha_0$. By virtue of (A1) the gross income level chosen by the high-ability type remains unchanged (at the efficient level). The new equilibrium is then given by the two bundles depicted as squares in the figure below.

Figure: The Optimal Solution for the Government Problem



By virtue of our earlier derivations, $h'(\underline{y}/\underline{w})/\underline{w}\leq 1$, thus the slope of the indifference curve of the low-ability type in the initial equilibrium (the triangle lying on the steeper indifference curve) is (weakly) lower than unity. Thus, it follows that $\underline{c}(\overline{\alpha}')-\underline{y}(\overline{\alpha}')\geq\underline{c}(\overline{\alpha})-\underline{y}(\overline{\alpha})$. As can be straightforwardly observed from the figure, $\overline{c}(\overline{\alpha}')-\overline{y}(\overline{\alpha}')<\overline{c}(\overline{\alpha})-\overline{y}(\overline{\alpha})$. We thus conclude:

$$[\underline{c}(\overline{\alpha}')-\underline{y}(\overline{\alpha}')]-[\overline{c}(\overline{\alpha}')-\overline{y}(\overline{\alpha}')]>[\underline{c}(\overline{\alpha})-\underline{y}(\overline{\alpha})]-[\overline{c}(\overline{\alpha})-\overline{y}(\overline{\alpha})].$$

However, by virtue of (A5) the last inequality implies that $\alpha_0'>\alpha_0$. We thus obtain the desired contradiction.

(ii) This part follows immediately from the expression in (A12) and part (i).

Stage III

Our final step would be to provide sufficient conditions for the expression in (A10) to be negative. By virtue of (A7) and as the incentive constraint of the high-skill individual is binding, it follows that $\alpha_0 / \overline{\alpha} \leq 1/2$. A sufficient condition for the expression in (A10) to be negative is hence:

(A13) $3/2 \cdot \overline{w} - 2(\overline{w} / \underline{w} - 1) \cdot h'(\underline{y} / \underline{w}) < 0$.

By part (i) of the lemma, the term $\alpha_0 / \overline{\alpha}$ is decreasing with respect to $\overline{\alpha}$. Suppose that $\overline{\alpha}$ is sufficiently small such that the term $\alpha_0 / \overline{\alpha}$ attains its upper-bound; namely, $\alpha_0 / \overline{\alpha}$ =1/2 $(\mu = 0)$. In this case, as the multiplier associated with the high-ability type's incentive compatibility constraint is equal to zero, it follows from (A11) that $h'(\underline{y} / \underline{w}) = \underline{w}$. Substituting into (A13) then yields:

(A14) $3/2 \cdot \overline{w} - 2 \cdot (\overline{w} - \underline{w}) < 0 \Leftrightarrow \overline{w} / \underline{w} > 4$.

Taking the other limiting case, by letting $\overline{\alpha} \to \infty$, it follows from (A4), (A6) and (A7), that $\mu = 1$ and $\eta = 0$ (and evidently, $\lambda = 2$). By the convexity of *h*, $h'(\underline{y} / \underline{w}) > h'(\underline{y} / \overline{w})$. It thus follows from (A9) that $\partial L / \partial \Delta \big|_{\Delta = 0} > 0$. That is, imposing a workfare requirement in the case of no misreporting is undesirable. We thus replicate the result obtained by Besley and Coate (1995)]. Thus, the expression in (A10) is positive. Hence,

(A15) $3/2 \cdot \overline{w} - 2(\overline{w} / \underline{w} - 1) \cdot h'(\underline{y} / \underline{w}) > 0$.

By continuity, employing the intermediate- value theorem, there exists some value of $\overline{\alpha}$ for which:

(A16) $3/2 \cdot \overline{w} - 2(\overline{w}/\underline{w} - 1) \cdot h'(\underline{y}/\underline{w}) = 0$.

By virtue of the lemma, as the expression on the left-hand-side of (A16) is strictly increasing with respect to $\overline{\alpha}$, this value is uniquely defined. Denote it by $\overline{\alpha}_0$. It then follows that when the moral costs entailed by misreporting are sufficiently small $(\overline{\alpha} < \overline{\alpha}_0)$, and when the difference between the skill levels is large enough $(\overline{w}/\underline{w} > w_0 = 4)$ imposing workfare is socially desirable as it economizes on government expenditure. This completes the proof.

A sufficient condition for the incentive constraint in (5) to bind

In the proof of the proposition it is assumed that the incentive constraint in (5) is binding. We turn next to establish a sufficient condition for the incentive constraint in (5) to be binding. We then turn to verify that the range of parameters for which workfare is a desirable supplement to means-testing (characterized by the proposition) is indeed well defined.

Claim: The following condition suffices for the incentive constraint in (5) to be binding:

(A17) $\overline{\alpha} \geq 2 \cdot \left[[\overline{y} - h(\overline{y} / \overline{w})] - [\underline{y} - h(\underline{y} / \overline{w})] \right]$,

where $\overline{y}$ and $\underline{y}$ denote the levels of income chosen by a high-skill and low-skill individuals, respectively, under *laissez-faire*.

Proof: Suppose that there is no workfare requirement in place (as in the statement of the proposition,) and suppose further, by way of contradiction, that the condition in (A17) holds but the incentive constraint in (5) does not bind. Hence, the *Lagrange* multiplier associated with the incentive constraint in (5) is equal to zero.

Repeating the steps in Stage I of the proof of the Proposition (see above for details) it follows by virtue of (A7) that:

(A18) $\mu = 1 - 2\alpha_0 / \overline{\alpha}$

Hence,

(A19) $\mu = 0 \Leftrightarrow \alpha_0 / \overline{\alpha} = 1/2.$

By virtue of (A1) and (A2) it follows that:

(A20) $h'(\bar{y}/\bar{w}) = \bar{w}$,

(A21) $h'(\underline{y}/\underline{w}) = \underline{w}$.

Hence, $\bar{y}$ and $\underline{y}$ denote the levels of income chosen by a high-skill and low-skill individuals, respectively, under *laissez-faire*.

By virtue of (A5) it follows that:

(A22) $\alpha_0 = (\underline{c} - \underline{y}) - (\bar{c} - \bar{y})$.

By virtue of the (non-binding, by presumption) incentive constraint in (5) it follows that:

(A23) $\bar{c} - h(\bar{y}/\bar{w}) > \underline{c} - h[(\underline{y}/\bar{w})]$.

It hence follows that:

(A24) $h[(\underline{y}/\bar{w})] - h(\bar{y}/\bar{w}) > \underline{c} - \bar{c}$.

Substituting into (A22), employing (A19) and re-arranging yields:

(A25) $\bar{\alpha} < 2 \cdot \left[[\bar{y} - h(\bar{y}/\bar{w})] - [\underline{y} - h(\underline{y}/\bar{w})] \right]$.

As (A25) violates (A17), we obtain the desired contradiction. This completes the proof.

In order to show that the range of parameters for which workfare is a desirable supplement to means-testing is indeed well defined, it suffices to verify that the threshold, $\bar{\alpha}_0$, defined in Stage III of the proof of the proposition, satisfies the condition in (A17) as a strict inequality. By construction of the threshold in the proof of the proposition (see Stage III of the proof for details) in order to show this it suffices to show that when $\mu = 0$ and the incentive constraint in (5) is binding, then $\overline{\alpha} = 2 \cdot \left[[\overline{y} - h(\overline{y} / \overline{w})] - [\underline{y} - h(\underline{y} / \overline{w})] \right]$.

To see this, notice that by re-writing the condition in (A23) as equality and re-arranging one obtains:

(A26) $h[(\underline{y} / \overline{w})] - h(\overline{y} / \overline{w}) = \underline{c} - \overline{c}.$

Substituting into (A22), employing (A19) and re-arranging then yields:

(A27) $\overline{\alpha} = 2 \cdot \left[[\overline{y} - h(\overline{y} / \overline{w})] - [\underline{y} - h(\underline{y} / \overline{w})] \right].$