Desirable incentive effects of income taxation II
Cases in which income taxation is preferable to lump sum taxation with the same ex post net transfers.

The main reason for progressive taxation is that the welfare cost of taking money from wealthy people is lower, because they have a lower marginal utility of consumption. I would like to discuss other advantages of income taxation, that is cases in which it can cause an increase in money metric welfare, or, in other words cases in which a distortionary tax and transfer policy is desirable even if, in the end (in the Nash equilibrium) everyone gets a transfer equal to taxes paid.

The incentive effects of taxation can be desirable for many reasons. I will try to list them in a series of posts. One very simple reason is that lower income is typically obtained by providing a goods and services to poorer people. This means that the signal from the market is not ideal – even if people obtain income by providing useful goods and services, the income depends on the usefulness divided by the consumers marginal utility of consumption.

For example, lawyers income depends on the wealth of their clients separately from the validity of their clients cases. For another doctors income depends on insurance coverage of their patients as well as the effectiveness of therapy and the need of the patience. I will address these issues in the second post in the series. In this post, I will assume that agents sell goods not services and that they sell them for the same price to all customers. Even in this case, there is a difference between the income maximizing choice and the most socially useful choice. Some people obtain more income selling luxuries that no one needs, but for which high income people are willing to pay a lot rather than selling necessities which poor people really want, but for which they can pay little.

People often perceive a difference between maximizing income and contributing as much as they can to society. There is nothing odd about this – it follows from absolutely standard assumptions about market prices and simple utilitarianism – economists most standard approach to welfare economics (which is an approach to social welfare often considered to underestimate the importance of equality).

So far, there is no hint of any reason why the incentive effects of income taxation might be useful. The novel assumption is that people are not perfectly completely selfish. If you would rather see well fed than starving children, then standard economic theory does not apply to you. It is very important to avoid the false dichotomy between the assumption that people are perfectly selfish and that they are perfectly altruistic. I have often read read proofs that people are not perfectly selfish presented as an argument against the assumption that people are partially altruistic. Before going on, the assumption I need can be that people care 100% as much about their own interests as about anyone else's. Such people would strike us as extraordinarily selfish, but they are not selfish enough for standard theory.

No one argues that people are selfish. Selfishness is almost always assumed in economic models. I can think of a number of justifications. One is that we should hope for the best but plan for the worst – hope that people are altruistic, but design a system which will work if they are perfectly selfish. I see no merit in this argument. In particular, we don't have to guess, we know people are partially altruistic. Another is that a system designed on the assumption that people are partially altruistic also works if they are selfish – it just isn't true that if one fears something might be true, then one should assume that it is. Another argument for assuming selfishness is that economists focus on arms length interaction, and altruism is important in interactions other than buying and selling. This post aims to demonstrate that that argument is invalid. A third argument for assuming selfishness is that altruism has benefits which are separate from the benefits of good policy. The main point of this post is that policies which are optimal if people are selfish and Pareto inefficient if people are partially altruistic.

The key paper in the literature on this topic is "" by Lester Thurow. Thurow's point is that if people are slightly altruistic, then redistribution from the rich to the poor can make everyone happier, can be a Pareto improvement. Rich person A likes the fact that money is taken from rich person B and given to a poor person. The small loss for person B bothers him a tiny amount, the large gain for person C pleases him a small amount. Person A does not want **his** money to go to the poor, but in a large society the huge amount of benefit to the poor from transfers from all the other rich people can make up for his (not totally) selfish desire to keep what he has. This means that rich people who support progressive taxation and welfare but don't give all of their money away are not necessarily hypocrites.

Thurow points out that even partial altruism is an externality and if people are partially altruistic, then equality is a public good. Standard arguments combined with the clearly true assumption that people are not completely 100% selfish imply that redistribution from the rich to the poor can be Pareto improving.

These posts are not simply a reiteration of Thurow's point. I will assume no net redistribution. The tax and transfers will not help the poor directly, however, their incentive effects may help the poor.

This post will assume that people produce goods and can choose whether to produce a necessity or a luxury good. Caring about the benefit of their product for the consumer, they will prefer, other things equal, to produce the necessity. In equilibrium, other things won't be equal because they can make more money producing the luxury. By reducing that incentive, income taxation can shift production from luxuries to necessities. This can increase welfare. This, in turn, can please everyone because people are partially altruistic (the last point is exactly Thurow's point.

A tiny super simple model.

To start I will assume a large finite population 2N and consider what happens when N goes to infinity and the economy approaches perfect competition. I assume symmetric information and that all people are self employed and produce goods (only not services) with labor alone and without productive capital. These assumptions are very unfavorable to income taxation. In each case, I will eventually get around to explaining examples of efficiency gains from income taxation based on imperfect competition, asymmetric information, and the complexities of employment relationships.

I will also assume people differ in ability and these differences are the only source of inequality.

The one deviation from the standard model in which lump sum taxation is superior to income taxation with equivalent net transfers is that I assume that people are not completely selfish. I assume a possibly very small degree of altruism. Utility functions are defined in two steps. First there is pleasure from consumption of the two goods and leisure v(c1,c2,l). then agent j maximizes

v(c1j,c2,l) + alpha sum_i v(c1i,c2i,l)

Where alpha is a positive constant which may be very small.

v(c1,c2,l) = ln(c2)+c1 + phi(l)

Agents can produce either good agent j produces y1j of good one and y2j of good 2

y1j + y2j = (1-l)a_j

a_j is the ability of agent j. 1-l is the amount of time agent j spends working.

I will assume a takes 2 values aL <1 and aH > 1 and that half of people have a_j = aL.

c1 is the numeraire. The pretax income of the able is aH and the income of the less able is aL.

There can be an income tax rate tau and there can be lump sum transfers of Th to the able and Tlto the less able.

In a standard model, if there is an income tax tau and transfers which return to each able agent the average income tax paid by an able agent and which return to each less able agent the average income tax paid by a less able agent, then the optimal tau is zero. The tax and transfer program implies zero net tax and transfer to each agent. However it affects incentives. In a standard model, this implies a dead weight loss which is not accompanied by any desirable transfer from rich to poor.

A super simple extreme example of the example

Now I will make an absurd assumption which implies a very high optimal tax rate. Just for this section, I will assume that phi(l) is a constant so labor supply is inelastic.

If 1< p2< 1/aL at Th<aH-1 then

The less able consume (aL(1-tau)+Tl)/p2 units of good 2 and 0 of good 1
The able consume 1/p2 units of good 2 and (aH+ y2(p2-1))(1-tau)-1+Th units of good 1.

for able agent j,

$\partial u/\partial y1j = 1-\tau+alpha.$

For example the agent can produce the good and consume it gaining 1 unit from pleasure of consumption and alpha from that agent's contribution to the sum of pleasure from consumption.

$\partial u/\partial y2j = p2(1-\tau) + alpha\ p2/(aL(1-\tau)+Tl)$

Writing in the constraint y1j+y2j = aH gives

$du/dy2j = (p2-1)(1- \tau) + alpha\ (\ (p2/(aL(1-\tau)+Tl)\ )-1)$

The second term is the increase in the sum of welfare of the less able. It is achieved via a reduction of p2 which is tiny for large N times a very large (aL+T)N/(2p2^2) effect of that on the welfare of the less able

so if they produce both goods, then

$p2 = (1-\tau +alpha)/(1-\tau+ alpha/(aL(1-\tau)+Tl))$

In principle the able could give good 2 to the less able reducing their consumption. They will do this if alpha is very large and aL is very small.

The first order condition for giving good 2 to the poor at giving 0 is

$- 1 + alpha/(aL(1-\tau)+Tl)$. For the solution to be the corner solution of give 0 it must be that

$alpha/(aL(1-\tau)+Tl)<1$ so

If the able produce both goods, the less able will produce only good 1, because they have a higher marginal utility of income and the same marginal utility of total economy wide pleasure from consumption.

To avoid any net taxes and transfers (and eliminate the standard utilitarian case for income taxation) I assume that Ah and Al are chosen so that, in equilibrium, they return the income tax.

$Th = (aH+ y2(p2-1))tau$

The income of the able in numeraire good is $aH+ y2(p2-1)$

$Tl = (aL)tau$

The income of the less able is aL, the condition for the able to not just give to the less able is $alpha/aL<1$, and

$p2 = (1-\tau -alpha)/(1-\tau+ alpha/(aL))$

$dp2/d\tau = alpha(1-1/aL)/(1-\tau+ alpha/(aL))^2<0$

The pleasure from consumption of the able is

$aH+ y2(p2-1) -1 -ln(p2)$

The pleasure from consumption of the less able is $ln(aL)-ln(p2)$

Total pleasure from consumption is

$(aH + y2(p2-1) – 1 +ln(aL) – 2ln(p2))N$

total welfare is

$(aH + y2(p2-1) – 1 +ln(aL) – 2ln(p2))N(1+alpha)$

market clearing implies that

$y2 = (1+aL)/p2$

So total welfare is

$(aH + (1+aL) – (1+aL)(p2-1)/p2 – 1 +\ln(aL) – 2\ln(p2))N(1+alpha)$

=

$(aH + (1+aL) -(1+aL)/p2 +aL +\ln(aL) – 2\ln(p2))N(1+alpha)$

We are considering what happens if the less able consume less than 1 unit of good 2

So $aL/p2 < 1$

d Welfare/dp2 = $(1+aL)/p2^2-2/p2 = ((1+aL)/p2-2)/p2$

If tau=0 then

$p2 = (1 +alpha)/(1 + alpha/(aL))$

so
d welfare/dp2 =

$((1+al)(1+alpha/aL)/(1+alpha) – 2)/p2= ((1+al)(1+alpha/aL) – 2 – 2alpha)/(p2(1+aL))=$

$(aL-1 + ((1+aL)/aL -2)alpha)/(p2(1+aL))= (aL-1+ (1-aL)alpha/aL)/(p2(1+aL))=$

$(aL-1)(1-alpha/aL)/(p2(1+aL))$

recall the condition for the able to not just give to the less able is alpha<aL and that aL,1 so

s $alpha<aL<1$ so

$dwelfare/dp2 < 0$

So $dwelfare/dtau>0$

In a case where the less able consume only good 2 and the able choose not to just give to the less able, the optimal income tax is positive.

This occurs even though, in equilibrium, income tax paid is returned to the taxpayerr and there are no net transfers.

The reason is that, so far as they are altruistic, agents prefer to produce the necessity good 2 not the luxury good 1. This incentive does not depend on taxation. Reducing the incentive to maximize income makes it relatively stronger, so the tax causes increased production of the necessity good 2 and increased welfare.

Notably, this is a reason the able may support income taxation even if they do not choose to give to the poor. Taxation not charity is not proof of hypocrisy. It can follow from rational altruism. As in the simple Thurow model, the point is that a reduction of P2 transfers from other able to people to less able people and an altruistic able person likes this. Altruism implies an externality which can make a low relative price of necessities beneficial to net suppliers of necessities.

Obviously, the assumption that labor supply is inelastic makes the result very strong. It means that tau should be increased so long as the less able consume less than one unit of good 2, that is so long as they have higher marginal utility of consumption than the able.

If labor supply is elastic, the normal second order dead weight loss from taxation appears and the optimal tax rate is lower so that optimal taxation does not eliminate all differences in the marginal utility of consumption.

The model is very strange as I have to assume a finite population of 2N and so agents are not price takers, then argue that as N goes to infinity, competition becomes perfect. Even for huge finite N, agents care about their effect on relative prices, because their tiny effect on prices helps a huge number of poor people (at the expense of a huge number of rich people).

It makes much more sense to consider a model in which agents know who is consuming the good or service they produce. I stuck with the standard assumption of anonymous trade and got into the embarrassing situation of assuming agents are not price takers. My next post will consider agents who provide a service and know the income of the people who purchase the service. Notice that the examples in the introduction are cases of this. I should have written that post first, but here we are.

The logic of producing good 2 is clear. It is a necessity and the contribution of increased supply of good 2 to total economy wide pleasure from consumption is greater than the contribution of increased supply of good 1. The aside of going through prices is a result of the standard (but not accurate) assumption that all trade is anonymous and agents just see (and affect) prices.

Even with this assumption, and with the assumption that there are no net transfers, the optimal income tax rate is not zero in this example with altruism.