EC741 Handout 4: The Demand for Government Services, Transfers, and Social Insurance [RDC]

I. Introduction: Self-Interest and the Demand for Public Services

Within democracies there are a wide variety of programs that take money from citizens through taxes of various kinds and "give" to others. In some cases, this occurs simply as part of the production of desired government services. Providing public education requires hiring teachers and administrators, constructing or renting buildings, and purchasing books and other class room materials. The sellers of all of those services and products receive money collected from taxpayers as compensation for services. This gives them economic reasons to favor broader service levels (as in Niskanan's model of bureaucracy), even if the salaries and prices paid are simply market ones.

In other cases, the persons receiving payments are not service providers, but simply beneficiaries of the services provided. Persons who like to hike tend to favor larger national parks and forests with large budgets for trail maintenance. Persons who like to bicycle tend to favor large budgets for new bicycle paths and maintenance. While persons who do not hike or bike mostly prefer relatively small levels of support for such services, because they do not personally value them. (A few may aspire to use them and so vote in favor of such expenditures because they expect or hope to use them in the future. A few others may believe that bicycling to work and shop takes cars off the highway system and so reduces their own travel times.)

In some cases, the goods that people want to be provided for personal reasons have properties that make them difficult for the private sector to provide. For example, (i) bicycle paths are difficult to create without right of ways which are difficult to assemble without the power of eminent domain. (ii) Some good and services are difficult to produce because they are pure or near pure public goods. They may not be excludable, in which case it is difficult to sell them, because once produced they are freely available to everyone. This tends to be true of national defense, clean air, and clean water (Samuelson, 1954). Or, (iii) they may be perfectly shareable but excludable, in which case natural monopolies tend to arise (zero marginal costs but with relatively high prices). In such cases, less than the social net benefit maximizing or Pareto efficient outputs will also be produced. In any of these cases, voters may vote in favor of government provision of such services.

(iv) There are a variety of risk management services that voters may ask governments to provide. They may do so for reasons similar to those already mentioned—national defense is an example of a risk managing service that is not excludable. Many national health care systems are cheaper for individuals with below average income when they are provided by government. But some goods may be difficult for markets to provide even though they are private goods. For exam-

ple, some types of insurance products are unavailable in markets because of the nature of the risks to be insured. Insurance companies do well when the risks being insured are basically uncorrelated and probabilistically well behaved (with knowable probability distributions and bounded damages). When the phenomenon to be insured has correlated risks its difficult to have a sufficient "reserve" to pay out claims—as tends to be true of hurricane insurance, earthquake insurance, and unemployment insurance. Because of their taxing ability, governments can provide "crisis insurance" more easily than private insurers, although there are still risks that can bankrupt governments as happened to Iceland and Ireland during the financial crisis of 2007-9 (Congleton 2012).

(v) If a service will be paid for with an income tax, there are many persons who will receive the service at "below market price (e.g. below marginal cost) because they pay below average taxes (which normally includes the median voter). This is one reason why self-interested persons with relatively low income or relatively high risks might some form of tax-financed healthcare over private insurance (see for example, Congleton, Batinti, Pietrantonio, 2017), but it applies to many other services as well that can and have been provided efficiently (at Pareto levels) through markets.

(vi) In addition, voters may have interests that are not fundamentally narrow. They may be partly motivated by ethical ideas, religion, altruism, or ideological impulses. For example, some of the support for transfers to the poor (food stamps, subsidized or free education and healthcare, low income housing subsidies) clearly exists because of narrow self-interest. Many persons benefit directly from such programs (or think that they might in the near future). However, the observed support is broader than one would expect based on observed risks. The direct beneficiaries of such programs are not numerous enough to have their way on such programs without the support of other voters when they are determined through voter demands. Thus, at least some persons who do not expect to use those services must also vote in favor of candidates that support such programs—assuming they are majoritarian based. They evidently do so for altruistic, ideological, or moral reasons. Such programs are sometimes referred to as "transfer programs."

The demands for government services extend well beyond the services that can be justified by utilitarian welfare economics and many services are arguably provided at excessive levels from the perspective of welfare economics—others are doubtless under provided. The main interest in this course is the political and economic factors that account for the expenditures that we observe. Thinking about philosophical issues are of interest, but of secondary import.

The purpose of this handout is to examine how different motivations affect the nature of the voter choices and thereby majoritarian outcomes. This is done for the most part with relatively sim-

ple models of such demands grounded on the median voter model. The cases modelled all have implications that can be tested with statistical methods, and to the extent to which such studies have already been undertaken, most of their implications have been borne out. It is also of interest to determine which of these types of demand provides the best "overall" explanation of the pattern of expenditures observed by contemporary governments.

II. The Demand for Pure Public Goods

The net benefit maximizing model can also be used to characterize a voter's preferred level of a pure public service, which is similar to but not the same as a voter's demand for a pure private good. Pure public goods are "perfectly shareable. That means that the same unit of a pure public good can provide benefits for a large number of persons simultaneously. Pure public good that are provided by governments are tax financed rather than priced in the manner of goods sold in markets. Prices still affect the quantity demanded, but in this case the price is determined by the tax system which determines how the cost of a service is "shared" among tax payers. Most tax systems imply that a person's tax cost (burden) increases with an increase in services. The increase in the tax burden associated with a change in a particular public service level is the marginal cost of the service for that voter.

The best way to think about goods, however, is not as a dichotomous private or public classification scheme for classifying all goods, but **as a continuum** from pure private to pure public goods, where goods vary by their "shareability." At the private end of the spectrum are goods like candy bars, shoes, and private insurance. At the public goods end, there are services like national defense, regulation that improve air quality, and such natural services as gravity and the moon. In between are various "club goods" such as swimming pools, local parks, airliners, and roads, and national parks that are somewhat sharable, but "congestible." Many of the goods in the middle can be considered what Buchanan (1965) referred to a "club goods." Club goods are sharable up to a point, but beyond that point the quality of the service diminishes as more persons partake of them. Nonetheless, the private-public dichotomy is often a useful simplification for theoretical work such as Samuelson (1954), although it misses much that is interesting and significant about the real world distribution of types of goods. (See Sandler and Tschirhart 1997, for an overview of the clubs and clubs good literature.)

Voter demands for public, club, and private goods can be analyzed geometrically (and mathematically) using the same net-benefit framework. A voter will prefer the government service level

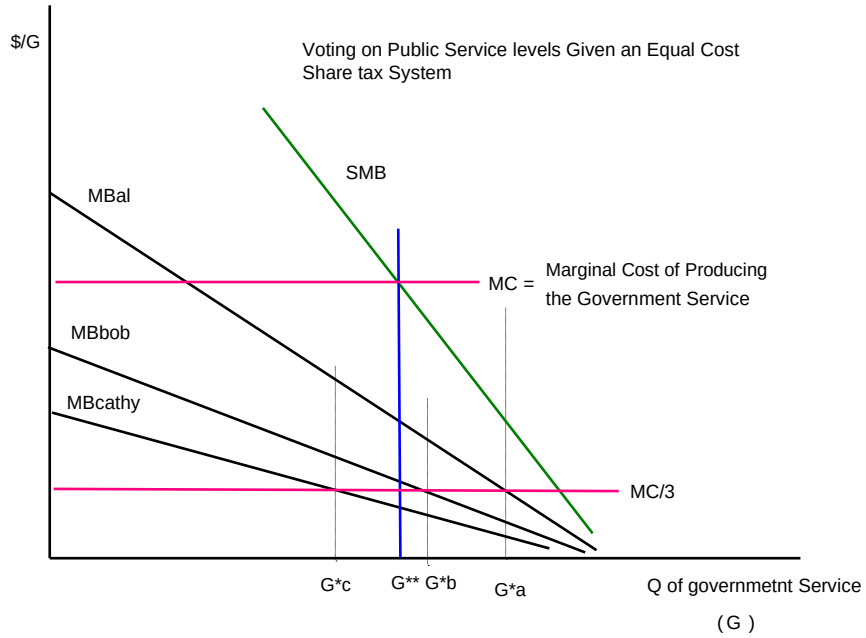
(of a pure private or pure public good) that equates his or her marginal benefit with his or her marginal tax cost for the service. (As shown in the mathematical models in the previous levels such MB=MC types of results also emerge from utility function calculus-based analysis.)

The Geometry of Public Good Demand and Optimality

At the level of individuals, the demand for pure public goods is analytically identical to their demand for private goods. In either case, their ideal quantity tends to be at the service level where their marginal benefits equal their marginal costs whether expressed in utility or dollar terms. However, the conditions for "optimality" of the quantity supplied (in the Paretian or social net benefit maximizing sense) tend to differ for pure private and pure public goods, because of differences in their shareability.

The marginal benefit curve for all consumers of a pure public good (SMB) is a "vertical sum" of individual marginal benefit curves, rather than a "horizontal sum," because all consumers benefit simultaneously from the services provided—rather than just one at a time. (A three-person choice over levels of a pure public service is llustrated in the diagram below.)

Illustration of the Geometry of the Median Demand for Government Services under a Simple Equal-Share Samuelsonian Tax System



The above diagram depicts the preferences of three persons (or equal numbers of three types of voters), each with a somewhat different marginal benefit curve for the government

service of interest (G). Differences in marginal benefits may reflect differences in tastes, or income, or combinations of the two. For purposes of illustration, it is assumed that the tax system in place is an "equal share" system. This is the easiest to draw and analyze, and will satisfy the Samuelsonian conditions for the Pareto efficient supply (G**) of a public services if the "right" service level is produced.[1]

Majoritarian Demand for a Pure Public Good

However, notice that given this tax system, these three voters will all **disagree** about the optimal level of the government services ($Q^*a \neq Q^*b \neq Q^*c$).

If a referendum is held to determine the service level, we know from our previous analysis that the median voter is likely to determine the outcome in a democracy in which candidates compete for votes. Recall that the median voter is the voter whose ideal point is exactly in the middle in the sense that there are exactly the same **number** of voters with ideal points to the left as to the right of his or her ideal point. In this case, Bob is the median voter. Thus, the predicted supply of this pure public good within a democracy is policy Qb*.

In the case illustrated, **this is not the same as the Pareto efficient level** of the public service. We have assumed self-interested voting, so Bob maximizes his own consumer surplus rather than social net benefits. However, we have not necessarily assumed narrow self-centered interests. In the case illustrated, Q** is somewhat below Qb*. Thus, the supply of public services will be somewhat higher than the net-benefit maximizing level of services. The reverse is also possible and depends on the distribution of voter preferences (here characterized with a distribution of MB curves).[2]

An individual's marginal benefit curve for a pure private good has properties that are identi-

[1] In the partial equilibrium context drawn, the Samuelsonian conditions require (i) that the quantity of the pure public good that maximizes social net benefits be produced (Q**), (ii) that the revenues collected be sufficient to pay for that quantity of the good provided ($T = c(Q^{**})$), and (iii) that the sum of the marginal tax costs or contributions to the good equal the marginal cost of producing the good. Q** is the Pareto optimal quantity of the pure public good and can be characterized as the quantity where SMC=SMB. The equal sharing rule satisfies all these condition, but would be unlikely to generate Q** unites of the pure public good under majority rule.

[2] It is also possible for Q** to be greater Q*b--draw such a case. What do these results imply about fiscal policy in a direct democracy, and/or for the dominant theories of welfare economics?

cal to those for pure private goods. The emerge from the same person's assessments with essentially the same mix of narrow and broad interests. So, for example, higher marginal benefit curves for a public service tends to be higher for relatively rich persons than relatively poor persons, because most government services are normal goods (as with education, roads, bicycle paths, national defense, etc.). This implies that relatively rich persons tend to have higher demands for public services than relatively poor persons, other things being equal.

However, other things (their marginal tax cost for the service) are not necessarily the same as those facing less wealthy persons. Under a progressive income tax for example, the marginal tax cost for a government service tends to be higher for a relatively high-income person than for a relatively low-income person. In such cases, rich persons may prefer lower levels of public services than a poor person, other things being equal. Nonetheless, each person tends to prefer the quantity of the public service that sets their own MTC equal to their own MB from the service. (Draw a diagram to illustrate this case.)

As noted above, every voter's demand for services depends in part on his or her tax price for that service. As a consequence, the tax system affects the identity of the median voter, because it affects the ideal points of all voters. Generally, a small "across the board" increase in the marginal tax rate faced by individuals for services (an increase in all tax rates) will reduce demands for services without affecting the "rank order" of voter ideal points—that is to say, without changing the median voter. However, major changes in tax law can alter the relative position of individual ideal points and thereby affect the identity of the median voter. For examples, rich voters will generally prefer lower levels of public service than poorer persons (rather than higher ones) under a under a progressive tax, but not under an equal share rule. Tax revenues generated by a sales tax tend to be a bit regressive (because rich persons save more of their income) which tends to reinforce the income effect on demand for services—other things being equal. Differences in the extent of progressivity also matter. For example, if some poor persons get the service for free (e.g. they pay no taxes for services provided), they'll prefer the service level that completely satiates their demand for the service(s) of interest. In such cases, the poorest persons may have the largest rather than the smallest demand for public services. This may be true in other cases as well, as in the demand for transfers explored in the next section.

III. The Electoral Demand for Transfers from Rich to Poor

The demand for transfers is very much like the demand for other public services, in that the individuals that demand them most tend to be those that have the highest marginal benefits for them. In the case of tax and transfer systems that shift resources from rich to poor, it is the poor who will have the highest demand, because they receive the transfers, and the non-altruistic rich that have the lowest demand for them. In between, are the demands of altruists—who will be ignored for most of this subsection, although they will be taken up toward its end. Broad transfer programs may receive majority support even without altruism.

A government that focuses mostly on transfers can be regarded as a special case of Olson's extractive model of the state. Transfers may take place from one interest group to another or from all tax payers to political elites or from the rich to the poor. We'll focus on the last case in this section of the paper—although the others also occur in the real world. The median voter model can shed light on the size of such programs, but does not provide as convincing an explanation for the others.

As in the case of public goods, the median voter's demand for transfers from the rich to the poor varies with the distribution of marginal benefits and costs. These, as it turns out, depend heavily on the preexisting distribution of income and on the incentive effects (excess burden) of the tax system. Such a model of redistribution was first worked out by Meltzer and Richard (1981, JPE). The model and diagram developed below are somewhat simplified versions of that model.

The Meltzer-Richard model assumes that essentially the entire governmental process is devoted to such programs. It also assumes that the rate of transfers adopted reflects the median voter's pecuniary interests. All voters are assumed to maximize their total income, which is the sum of their after tax income and transfers from a demogrant program. A demogrant program, as such programs are usually modeled, is funded with a proportionate tax on income and gives all taxpayers the same lumpsum grant. That lumpsum grant could be in cash or kind, or combinations of both. For example it could include free health care, education, a packet of "food stamps," and a cash grant.

The Meltzer-Richard model assumes that income varies with tax rates, because of leisure labor tradeoffs and that there is a balanced budget rule. Rather than fully model labor leisure choices, the model below simply assumes that pre-tax income falls as the tax rate increases. National income is thus represented as:

$$\mathbf{Y = \Sigma\, y_i(t) = nY^A(t),}$$

where y_i is the pretax income of individual i, $Y^A(t)$ is average income, n is the number of voter tax-

payers, and Y is national income.

The balanced budget assumption requires that total tax revenue, tY equals the total amount distributed as demogrants (G), thus **tY = nG** where there are n tax payers, each receiving grant G. Note that this constraint implies and can also be written as: $t\,Y^A(t) = G$ or $t=G/Y^A(t)$.)

Individuals maximize utility, which increases with consumption, which in turn is produced by after tax income and the demogrant. Individual i's is thus:

$$\mathbf{Ci = (1-t)Yi + G},$$

where $Yi = y_i(t)$ and individual utility is **U = u(Ci) .**

Substituting the governmental and personal budget constraints into the voter's utility function and differentiating with respect to G allows a voter's utility to be characterized as:

$$U = u[(1- t)\, y_i(t) + tY^A(t)\,]$$

Differentiating with respect to t allows the individual's ideal demogrant program to be characterized whenever the ideal tax rate is between 0 and 1.

$$(dU/dC\,)\,[\,-y_i(t) + (1-t)\,dy_i/dt + Y^A + t\,dY^A/dt] = 0$$

Recall that given ideal tax rate t*, the associated demogrant G* is $G^*=tY^A(t^*)$.

Note that the first order condition that characterizes t* can be written as:

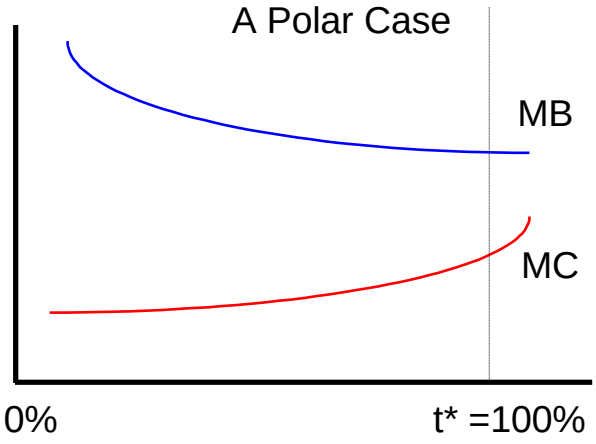
$$y_i(t) - (1-t)\,dy_i/dt \;= Y^A + t\,dY^A/dt$$

The left side is the marginal cost of higher taxes (reduced after-tax income) and the right side is the marginal benefit of taxes (larger demo grants). MC is rising in taxes because dy_i/dt is less than zero, while MB is falling because dY^A/dt is less than zero.[3]

The deadweight loss terms (incentive effects on personal income) are the reason why the Melzer-Richards model has an equilibrium. Without effects of tax rate on income, there are corner solutions for most voters. All persons with below average income prefer t=1 (100%) and G = Y/n . All persons with incomes higher than average income prefer t=0 and G=0. Voters with average income are indifferent between all demogrant programs, because they realize the same income from every level of t, namely average income. The figure below illustrates the case in which the income effects of taxes on national income are small enough that polarization occurs for the median voter,

[3] Benebou (2000) suggests that such programs may actually increase, rather than reduce, economic growth if there are large imperfections in credit and insurance markets. This effect would have to be large enough to dominate the labor leisure tradeoffs of typical middle-class voters.

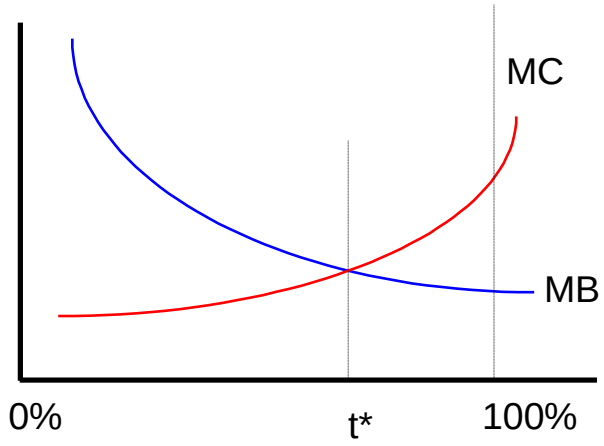
who in this case prefers confiscatory taxation and redistribution.



When the incentive effects on income are larger, some person with below average income—including with luck the median voter—will prefer intermediate tax rates and demogrant programs, rather than the egalitarian result. (For this to be true the MC curve hast to be a bit more steeply upward sloping and/or the MB curve a bit more downward sloping.) In their classic paper, probably because of their more complex modeling of labor supply choices, Meltzer and Richard missed this problem with their model, and focused entirely on such "well behaved" cases in the middle.

A transfer state, thus, may adopt moderate levels of transfers from rich to poor, but this depends on the magnitude of deadweight losses generated by the tax system, the distribution of pre-tax income, and sophisticated economic knowledge of middleclass voters. For example, with a symmetric distribution of income, median income equals average income, and so only a small incentive effect is enough to generate intermediate results. In the case where the middle class and upper class are small, a fairly large incentive effect is necessary to generate moderate results. (The latter suggests that before the industrial revolution, democracy would have been prone to extreme redistribution and poverty—what I have termed a poverty trap—in the pre-industrial world.)

Geometry of Median Voter Expected Marginal Costs and benefits for and Intermediate Transfer State



One would get more redistribution than implied by the Meltzer-Richard in cases in which the median voter had altruistic or somewhat egalitarian preferences.[4] One would get less redistribution than this model suggests if the median voter has internalized a "just desserts" or "natural rights" norm that regards the preexisting market-based distribution of income to be just (approximately equal to each person marginal revenue product and thereby contribution to national output measured in dollars).

Note that the latter can produce moderate redistributive outcomes in cases that would otherwise tend toward extremes. (In effect, such norms increase the marginal cost of higher demogrant taxes (through guilt effects), making the MC curve more likely to intersect an individual's MB curve in the intermediate range of taxes and demogrants, whereas the opposite ideological propensity

[4] Hochman and Rodgers (1969) demonstrate how and why altruists tend to vote to create income redistribution programs. A similar argument is sometimes made by some contractarians, who regard redistributive programs as part of a social contract. For example, Rawls (1971 / 1999) argues that people who were designing a society from behind a "veil of ignorance" would adopt programs that maximize the welfare of the least advantaged. Rawls reaches this conclusion by assuming rather strong risk aversion. Other contractarians might agree that such programs are necessary prerequisites for reaching agreements that characterize contract-based societies, but that modest levels of transfers or social insurance programs would be sufficient to insure persons against bad luck in the society that emerges from such contracts..

tends to reinforce tendencies for confiscatory tax and transfer systems.[5]

IV. The Demand for Social Insurance

The politics of social insurance shares some properties with that of transfer programs, however, rather than condition transfers on income levels, the "transfers" (insurance payouts) are conditioned on disasters of one kind or another, or modelled on the basis of annuities, which is a different kind of insurance product than auto, health, and flood insurance. Rather than large transfers from rich to poor, what we mainly observe in Western democracies are insurance-like transfers from the healthy to the sick, from employed to the unemployed, from the able-bodied to the disabled, and from those on high and dry land to ones damaged by floods. And also annuity-like products such as tax-financed pensions for retired persons.

The demand for insurance can be modelled in a fairly straightforward fashion and a "club-like" model can be used to think about the demand for both private and government insurance. The following model is taken from Congleton (2007).

An Illustrating Model of Health/Disability Insurance Demand

Consider a setting in which a debilitating disease randomly strikes people and saps their ability to work and play. To simplify the analysis, assume that only these two states of health are possible and that the probability of being sick is P and being healthy is 1-P. When healthy, a typical person, Alle, has H hours to allocate between work, W, and leisure, L, and when sick has only S hours to allocate between work and leisure. Work produces good Y, which is desired for its own sake, with $Y_i = \omega W_i$, where ω is the marginal and average product of labor.

The individual (i) chooses his or her work week, according to his or her health, to maximize a strictly concave utility function defined over consumption (which is presumed to be the same as the individual's pretax income (Y_i) in the absence of insurance) and leisure (L_i), with $U = u(Y_i, L_i)$.

In the absence of a disability or health insurance program, which is denoted with the superscript "woH," when Alle is healthy, she (or he) maximizes:

$$U^{woH} = u(\omega W_i , H - W_i) \quad (1)$$

and when Alle is unhealthy (indicated with superscript woS), she maximizes:

$$U^{woS} = u(\omega W_i , S - W_i) \quad (2)$$

[5] The Becker (1983) and Tullock (1981) papers have a similar "extractive" implications insofar as interest groups compete with each other for direct transfers and indirect transfers accomplished through priveleges and entry barriors of various kinds. Interest group models regard transfers to be the results of rent seeking. They are not redistributive in the sense above in that they take money from taxpayers and give recipients who

In either case, Alle's work day will satisfy similar first order conditions:

$$U_Y \omega - U_L = 0 \quad (3)$$

Alle works at the level that sets the marginal utility of the income produced by her (or his) work equal to the marginal cost of that work in terms of the reduced utility from leisure. The implicit function theorem implies that Alle's work day can be characterized as:

$$Wi^* = w(T, \omega) \quad (4)$$

Where T is H or S according to whether he/she is healthy or sick.

Now consider the case in which Alle can join an income security club that collects a fraction of the output produced by each member and returns it on a uniform basis to club members, guaranteeing each member G units of good Y. In this case, Alle's net income is $Y = (1-t) \omega Wi + G$. If all club receipts are used to fund the guarantee, the income guarantee is $G = (t\omega \Sigma Wj)/N$, when there are N members of the income security club.

Given such a program, Alle now maximizes

$$U^H = U((1-t) \omega Wi + G, H - Wi) \quad (5)$$

when healthy and

$$U^S = U((1-t) \omega Wi + G, S - Wi) \quad (6)$$

when sick, which again requires work days that satisfy similar first order condition:

$$UY [(1-t) \omega + t\omega /N] - UL = 0 \equiv Z \quad (7)$$

Equation 7 is very similar to equation 3, except that now Alle equates the marginal utility of net income produced by working (which is now a combination of direct effects of club dues and effects of the club's income security guarantee) to the marginal opportunity cost of the time spent working. The implicit function describing Alle's work day becomes:

$$Wi^* = w(T, \omega, t, N) \quad (8)$$

Note that equation 8 is the same as equation 4 if the club dues and benefits equal zero. T again represents the individual's state of health and takes the value H if he or she is healthy, and S if he or she is sick.

The implicit function differentiation rule can be used to show that that Alle works more when he/she is healthy than sick, and **works less when she is in a social insurance program than when he/she is not.** (See Congleton (2007) for the math and reasoning behind this.)

Alle's **reservation price** for joining an income security club is the price, M, which sets the

---

normally have above average income.

expected value of lifetime membership in the club equal to that of nonmembership. That is to say, M, makes Alle indifferent between having an income guarantee and not having one. Individuals are willing to join an income security club of some kind whenever their reservation price is greater than zero, but not every such club that might exist as demonstrated below.

Alle's reservation price can be calculated by using equations 1,2, 5 and 6 to characterize expected utility functions. The highest prices that Alle is willing to pay to join his or her ideal club, M*, is one that satisfies:

$$(1\text{-}P)\ U^{H*} + P\ U^{S*} = (1\text{-}P)U^{woH*} + P\ U^{woS*}$$

or substituting,

$$(1\text{-}P)\ [U(\ (1\text{-}t)\ \omega\ Wi^{*} + G - M, H - Wi^{*})\ ] + P\ [\ U(\ (1\text{-}t)\ \omega\ Wi^{*} + G - M, S - Wi^{*})\ ] -$$

$$(1\text{-}P)\ [\ U(\ \omega\ Wi\ , H - Wi)\ ] - P\ [\ U(\ \omega\ Wi\ , S - Wi)\ ] = 0 \qquad (12)$$

Since equation 12 has the value of zero, the implicit function theorem allows the comparative statics of Alle's reservation price M to be written as a function of the other parameters of Alle's decision problems:

$$M^{*} = m(\ t\ , P, S, H, \omega\ , N) \qquad (13)$$

Three derivatives of Alle's reservation price for income insurance are of special interest for the purposes of this section of the paper: first, that with respect to the probability of being sick; second, that with respect to the severity of the illness; and third, that with respect to the size of the income guarantee, which can be represented with the club's "tax" rate t (which can be interpreted as dues or fees for private clubs) over the range of interest.

$$MP = [\ (U^{woH} - U^{H}\ ) + (U^{S} - U^{woS})\ ]\ /\ [\ -\ M\ ] > 0 \qquad (14.1)$$

$$MS = [P(US\ L - UwoS\ L)\ ]\ /\ [-\ M\ ] < 0 \qquad (14.2)$$

$$Mt = [\ (1\text{-}P)UH\ Y\ (\ \omega WAve - \omega\ Wi\ H^{*}\ ) + P(US\ Y\ (\omega WAve - \omega\ Wi\ S^{*}\ )\ ]\ /\ [-\ M\ ] <> 0 \qquad (14.3)$$

where $[\ M\ ] = (1\text{-}P)U^{H}\ Y + PU^{S}\ Y > 0$

Alle's willingness to pay for club membership increases as the probability of being sick increases, but decreases as the loss from illness declines (H-S) and may increase or decrease with the extent of the social insurance provided according to whether the higher guarantee is more valuable than the higher dues that must be paid. (Recall that the tax or club dues rate t must increase to pay for higher income security payments.)

Alle's ideal income security club is the one that maximizes her reservation price. The optimal insurance program sets the club dues or tax rate, t*, so that equation 14.3 equals zero. Alle's reserva-

tion price rises as t approaches her ideal tax rate (which is not zero because it is linked to benefits) t*, thus, M* increases with increases in t if t< t* and it falls with increases in t for t>t*.

It bears noting that **corner solutions are possible** for t according to the degree of perceived income risk and the extent to which Alle is risk averse. Note that the first term of equation 14.3 is negative and the second is positive. Alle gains from the program when he/she is sick, but loses when he/she is healthy. Recall that G = (t ω Σ Wj)/N which, when N is large, can be written as tω [(1-P) w(H, ω, t, N) + Pw(S, ω, t, N)]. **The income guarantee is the average amount of tax revenue collected.**

Only if [(1-P)U^{H}Y (ωW^{Ave} − ω Wi H*) + P(U^{S}Y (ωW^{Ave} -ω Wi S *)] > 0 over the entire feasible range of t, will Alle prefer a program with complete income security to one that with modest benefits. This tends to be the case if the marginal utility of income declines very rapidly or the income losses are very large and club members have a very inelastic supply of labor function (e.g., Wi^{Ave} - $Wi^{Ave/wo}$ small), the benefits of insurance exceed its costs.

On the other hand, it is also possible that [(1-P)U^{H}Y (ωW^{Ave} − ω Wi H *) + P(U^{S}Y (ωW^{Ave} - ω Wi S *)] < 0 over the entire range of interest; in which case, Alle will never voluntarily join an income security club. Such would be the case if the supply of labor is very elastic, the losses from illness are minor, and Alle is not very risk averse.

The point of this analysis is not to suggest that a voluntary income security program is necessarily large or small, but to demonstrate that voluntary social insurance clubs are possible and that the insurance demanded is not necessarily trivial. A wide range of income security clubs may advance an individual's interest in income stability according to his or her risk aversion and assessment of the objective risks faced.

The shift from private clubs to government supplied health insurance (which in this case is more like disability insurance) may occur because private clubs are unreliable, because of progressive taxation which in effect gives below average income persons a discount on the tax-financed healthcare, or because of selection effects for private clubs that tend to make them unprofitable/unsustainable because only relatively "sickly" persons joint such clubs, making them prohibitively expensive.

As in the case of transfer programs, such tendencies can be reinforced by ideological or normative propensities of middle-income voters. (For more on the feasibility, mathematics, and political dynamics of such programs see Congleton 2007 (CPE: https://link.springer.com/article/10.1007%2Fs10602-007-9018-0).

Of course, insurance like products are not the only way that risks can be addressed by governments. Governments may also adopt regulations that reduce various kinds of risks, such as speed limits and other safety standards, or provide services which are believed to reduce risks such as national defense and support for healthcare research and development.

To the extent that such risk managing services have broad effects on risk, they may be regarded to be pure public goods—as opposed to insurance like products which are normally pure private goods (excludable and non-sharable at the level of individuals).

V. The Demand for Government Services

All four types of demands are evident in most democratic governments: demands for private goods, public goods, transfers, and social insurance. However, as noted in the introductory lecture (and developed in its tables), there are differences in the degree to which central governments devote resources (raised through taxation and borrowing) on them (e.g spend on them). In 1900, most governments were chiefly involved in the production of services such as national defense, transportation networks, and law and order. Since that time, there has been a shift toward transfers and especially various insurance-like products such as tax-financed pensions and healthcare (or payments for healthcare).

If one were to classify expenditures in the US into those categories, the last two or three decades of expenditures have prioritized various risk management services over pure public goods of the variety most public economics courses tend to stress. Public-goods-centric expenditures might have been a reasonable characterization of central government spending in 1954 when Samuelson wrote his famous piece, but it is no longer the best explanation for the pattern of observed government expenditures.

Nonetheless, there are special cases—particular types of expenditures—that do fit each of the four categories of voter demands reviewed in this handout.