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

The chapter on the median voter model, includes a model or two of the electoral based demand for regulation and public services. Voter-taxpayers, like the ordinary consumers of neoclassical economics, can benefit from a wide variety of goods and services. Most of these can be produced and supplied through either private markets or through their governments. At a given point in time, these services come to be provided one way or the other or through a combination of the two—as when governmental healthcare or education systems pay private providers for services provided to individuals or groups of individuals.

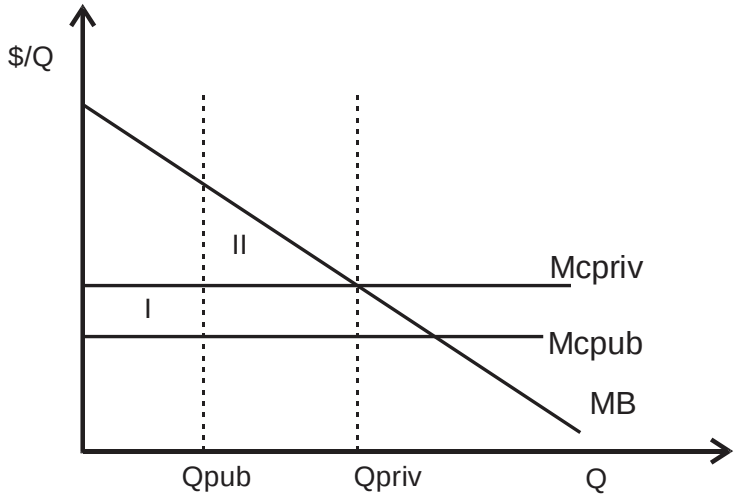
How a given service is provided—privately or through governmental actions--reflects past decisions of voters in cases in which the manner of provision is a consequence of electoral pressures or the past lobbying efforts of politically active interest groups when it is not—or some combination of the two when it is influenced by both. This chapter focuses on the decisions of tax-payer voters that concern the goods that they prefer government prefer and the quantities that they would like to have provided and that which is likely to be provided.

If a voter is motivated by narrow self-interest and believe that a service or good would be less expensive them if provided through market networks, they will prefer private to government supply of such services. If a voter expects a service to be about the same price and quality whether it is provided by market networks or paid for with taxes, but he or she prefers his or her own choice of the service level to that likely provided by the government (as with the median voter's preferred service level), then he or she will opt for private supply. In that case, the voter can get exactly the level that he or she prefers. In is only in cases in which a voter's anticipated tax cost is lower than the market price of the service of interest, and the anticipated service is anticipated to be within the range in which the net benefits are larger than that associated with market provision, that a voter prefers governmental provision to private provision.

The latter varies with the tax system in place, which ultimately determines the tax price for a service, the prevailing market price for that service, and the likely service level associated with the different manners of provision. In the case of markets, it will be the voter's own net benefit maximizing or utility maximizing service level, given the prevailing market price at the time of purchase. In the case of governmental provision, it will be approximately that preferred by the median voter in a well-functioning democracy—ignoring various political agency problems that might bias service levels away from the median voter's preferred service level.

The figure below illustrates a voter-consumer's choice when the tax price is lower than the market price, but the expected service level is also lower. This is one of the "tricker" cases to analyze. The price faced by the voter-consumer is better from public provision, but the extent of the service is anticipated to less than he or she would have purchased in the private market. This may be true of some medical services or some types of insurance. In this case, the voter-consumer's preferred supply system is not determined by prices alone. As depicted, the greatest net benefits associated with it is determined by the relative size of areas I and II. If area II is larger, the voter's net benefit is larger at Qpriv than at Qpub, but if not, then he or she will favor public provision over private provision.

Figure 4.1: Public/Private Choice



In cases in which a voter-consumer is uncertain about the service level that will be provided by government, that uncertainty will reduce the expected marginal benefits of government provision. In cases in which a voter has an ideological disposition that favors government supply, that disposition will add to the marginal benefits associated with government supply, making it more likely than it would otherwise have been. (Uncertainty might be generated by a variety of factors such as agency problems, voter inconsistency, and doubts about the quality associated with government provision.)

Both the market price and the tax price are important determinants of a voter-consumer's decision about which system he or she prefers to be the source of the goods or services of interest. They will be decisive in many cases—but not all cases, because of ideological effects and expectations about the relative extent and quality of the goods and services from the two systems by which

a service might be produced and distributed.

Another factor that can be significant is the nature of the service itself. Is it even available for purchase from markets? And if so, can one purchase any quantity of it that one wants? In cases where little if any of the desired service is available from markets, a voter-consumer will favor government supply when the expected tax and service combination brings positive net benefits.

II. The Demand for Pure Public Goods

One type of good for which markets are not likely to provide much of is a pure public good. A pure public good is perfectly shareable—as many people as want to can make use of such a service simultaneously without reducing the quality of service available to others. A pure private good is not shareable in this sense. As more folks make use of a private good, each person's use or "piece" of it shrinks. In between are "club goods" which are somewhat shareable, but where the quality or extent of the service fall somewhat as the number of users increases, but less than proportionately. Club goods, like highways, are often congestible.

A pure public good may be conceptually "excludable" or not, but it is not only that property that causes difficulty for markets. It is certainly more difficult to sell units of a perfectly shareable good that is not excludable. (Broadcast radio and TV are examples of local pure public goods that are not excludable, but which are nonetheless privately provided in the United States.) Services like national defense that are pure public goods are potentially excludable are usually provided in a manner that makes little effort to exclude individuals form the protection provided. National defense is nearly always a service provided by governments. Goods that are perfectly sharable, but excludable tend to become monopolistic markets, because the marginal cost of adding consumers of a given service is essentially zero.

Excludability is often a matter of expense. It is technically difficult (expensive) to provide defense for just one houe in a neighborhood. It is often easier (less expensive) to provide it in a non-excludable manner for the entire neighborhood. Such services are perfectly sharable and non-excludable and thus difficult for private providers to profit from. As a consequence, many are in sense under provided and others not provided at all. In some cases, a decision about whether to provide a pure public good privately or publicly has to be made, but when a pure public good is essentially unavailable privately, the question changes to "do we want this service or not?" not whether to provide it through government or the private sector or some combination of the two.

The net benefit maximizing model can be used to characterize a voter-taxpayer'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.[1]

Voter demands for public, club, and private goods can be analyzed geometrically (and mathematically) using the same net-benefit framework. The main difference in the models is how one takes account of the goods shareabililty. In all three cases, a voter-consumer will prefer the service level 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 sections, such MB=MC types of results also emerge from utility function calculus-based analysis as well.)

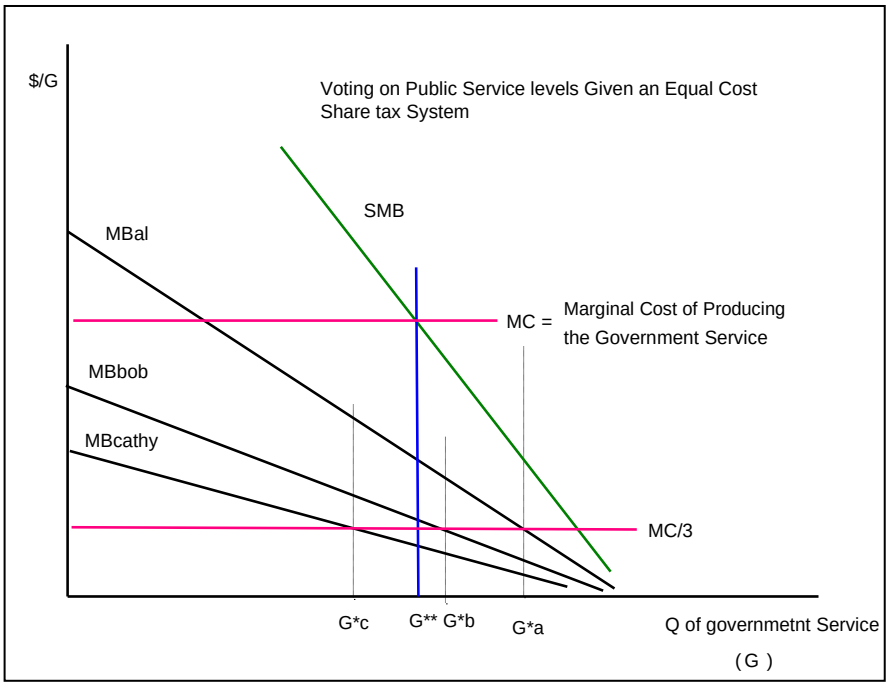
The Geometry of Public Good Demand and Optimality

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 illustrated in the diagram below.)

[1] The shareability of goods is **continuum** from pure private to pure public goods. 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 club good literature.)

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 it will satisfy the Samuelsonian conditions for the Pareto efficient supply (G**) of a public service if the "right" service level is produced.[2] Many private clubs and condo associations use such financing methods. It is

[2] 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 conditions, but it would be unlikely to generate Q** under majority rule for reasons developed in the text.

begin used here simply because it is most like a private pricing system and so is easiest to interpret.

Majoritarian Demand for a Pure Public Good

When the private level of the service is zero, it is easy to show that there are unrealized potential gains from "government" provision of the service. 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, which in this case occurs where the sum of net benefits (social net benefits) is maximized. 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).[3]

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

[3] 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?

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.

Note that 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 Demand for Tax-financed Insurance Products

The demand for tax-financed insurance is, in principle, the demand for a governmental provision of a pure private good or service. Some of these insurance products are true insurance

products where the probability of the "accident" or "tragic condition" is well understood and there is no purely economic reason that it cannot be provided through markets. Others are what might be termed instances of "crisis insurance" that reflect unknown or unknowable stochastic processes that would not be insured by ordinary markets. Also, what might termed "high tail" risks may not be covered by private insurance without risking the survival of the company providing it. Thus, most private insurance products have numerous exclusions (no earthquakes or revolutions covered) and maximum payouts that are often less than the losses experienced. Such cases can make the demand for tax-financed social insurance similar in some respects to the pure public good case analyzed in the previous section. Some desired products may not be provided by market either because the risks are large and hard to evaluate or the risks are just to great to fully insure because of the limited demand for such insurance products.

Even though insurance is excludable and not shareable in the usual sense, sharing a risk often makes sense for risk-averse persons, and in some cases the tax system provides the means through which such risk can be shared. However, the bulk of tax-financed insurance resembles insurance products that are widely provided by private markets such as health insurance, unemployment insurance, and pension annuities—albeit with various exclusions and limits, some of which are shared by their tax-financed counterparts.

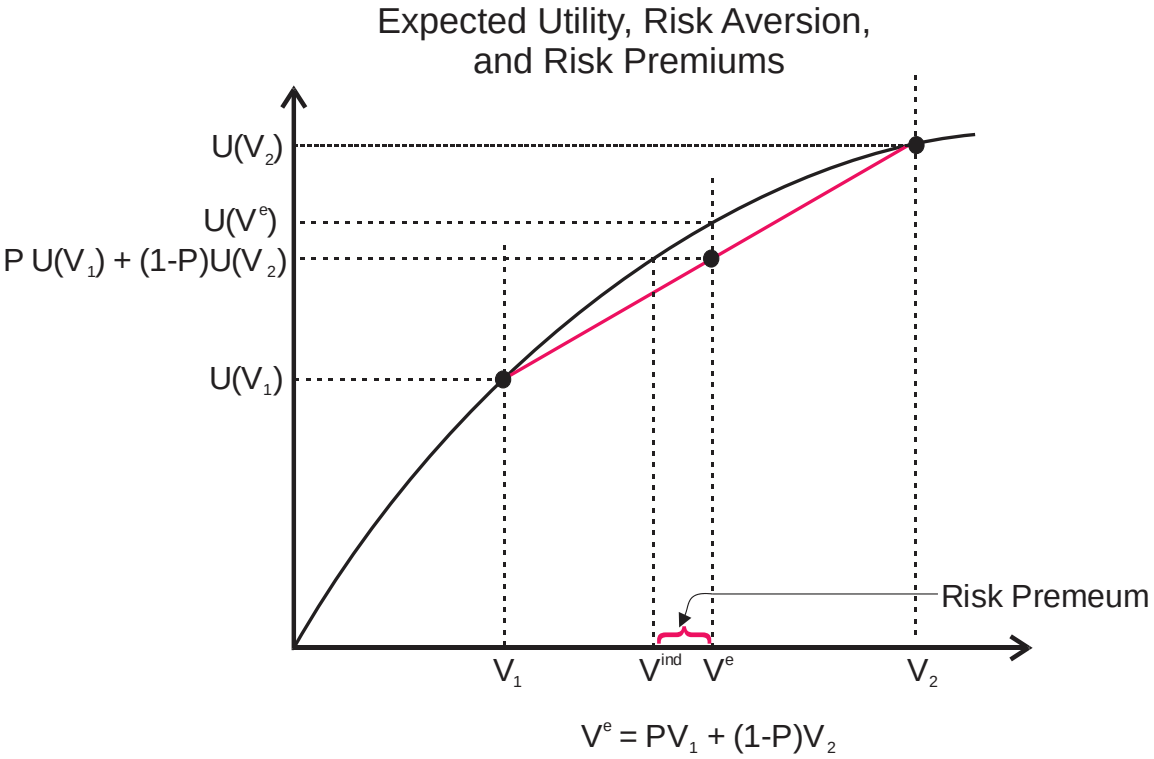
The demand for tax-financed insurance products like these are simply a case where a majority of voters find the service to less expensive for themselves when it is provided through government than when purchased through governments. Under an income tax, the tax system, in effect, reduces the price paid for insurance for low and medium income taxpayers and increases it for those with above average income. In today's liberal democracies these insurance-like products are often the largest expenditures on a nation's budget.

In this section, we first see why individuals might want to purchase private insurance, which is followed by a discussion of why tax-finance can be attractive if the quality of the governmental insurance is expected to about the same or higher quality than that available to private purchasers of insurance (within the same risk and income class). The model is based largely on Congleton (2007), a

model that was extended in various ways in subsequent papers.[4]

The Geometry of Risk Premia

The private demand for insurance follows from risk aversion, which, in turn, is associated with strictly concave utility functions—the ones normally assumed in neoclassical economics. The figure illustrates why individuals are willing to pay a premium to avoid risk—whether in the form of a price for insurance or an earmarked tax to fund a government provided insurance product.



A person confronts a known risk that with probability P outcome V_1 occurs and with probability (1-P) outcome V_2 occurs. Assume that V_1 and V_2 are denominated in dollars of value. V_1 might be the value of one's house if a flood occurs that damages the house and V_2 its value if no flood occurs or only one that does not damage the house. The expected value of is V^e, but notice

[4] Insurance, per se, has some resemblance to "transfer" programs, However, 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 those on high and dry land to ones damaged by floods, from the able-bodied to the disabled, and from the young to the old. The latter are often annuity-like products that provide tax-financed pensions for retired persons. Nonetheless, tax-financed insurance is sometimes favored by altruists and for those accepting particular ideologies as a method of "in kind" transfers to low-income persons that would otherwise be able to purchase only very limited insurance products. This section neglects persons with such beliefs in order to focus on why persons of the variety assumed in most economic models might prefer tax-financed insurance to private insurance for themselves.

that the expected utility of the risky setting is lower than the utility at the risky situation. The individual is willing to pay up to $V^{ind} - V^e$ for insurance that would assure that V^e is obtained with certainty. A large insurer (whether a private organization or a government) can sell the insurance for V^e plus administrative costs since its average annual payout will be very close to V^e. When administrative costs are less than the risk premium that the individual is willing to pay, there are potential gains from trade that can be realized through insurance—e.g. through risk sharing.

Insurance products are, of course, not without risks since one does not really know the quality of the insurance until one needs it, and an insurance company with correlated risks might well go bankrupt at exactly the time that one needs the insurance—as many mortgage insurers went bankrupt during the 2008-9 financial crisis. Governments, on the other hand, rarely go bankrupt, because when they run a deficit they can usually simply raise taxes. This gives them an advantage as insurers that voters evidently take account when deciding whether or not to favor a tax-financed insurance program.

The mathematics behind insurance and the various reasons why a voter-consumer might prefer tax-financed insurance to private insurance is discussed in the next two subsections.

A Model of the Demand for Health Insurance

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 either for its own sake or because it can be used to purchase ordinary goods and services and healthcare. Alle's income varies with the number of hours worked, as with $Yi = \omega Wi$, 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 (Yi) in the absence of insurance) and leisure (Li), with $U = u(Yi, Li)$.

In the absence of a health insurance program is denoted with the superscript "woH," when Alle is healthy, she (or he) and "woS" when Alle is sick. In that setting, Alle maximizes:

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

and when Alle is unhealthy, she maximizes:

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

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

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

Subscripts Y and L denote partial derivatives with respect to those variables. 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. If S<H, Alle works a shorter workday when ill than when healthy. The implicit function theorem implies that Alle's workday can be characterized as:

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

Where T is H or S according to whether he/she is healthy or sick. If P is the probability of being sick, then Px100 is the percentage of days that Alle works less than usual.

Now consider the case in which Alle can join an income security club that collects a fraction of the output (income) produced by each club member and returns it on a uniform basis to club members when they are sick. On sick days, each member receives an additional G units of good Y from the club (or firm). In this case, Alle's net income on a sick day is $Y = (1-t)\ \omega\ Wi^S + G$. If all club receipts are used to fund the guarantee, the income guarantee is $G = (t\omega\ \Sigma\ Wj)/PN$, when there are N members of the income security club and P is the average probability of being ill.

Given such a program, Alle now chooses W_i to maximize

$$U^H = U((1-t)\ \omega\ W, H - W) \qquad (5)$$

when healthy and

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

when sick, which now requires workdays that satisfy two different first order conditions:

$$U^H{}_Y\ [(1-t)\ \omega\ ] - U_L = 0 \qquad (7a)$$

$$U^S{}_Y\ [(1-t)\ \omega + t\omega\ /PN] - U_L = 0 \equiv Z \qquad (7b)$$

Equation 7a 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 wage rate). Equation 7b characterizes the effects of the club's income security guarantee when ill. Note that it implies that Alle works less when ill than previously. The additional income from the insurance club reduces the marginal utility of income, which induces Alle to use more of her time for

leisure in order to make the two partial derivatives equal to each other.[5]

The implicit function describing Alle's workday is:

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

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. With S<H, Alle works less on sick days than on healthy days, but less after sick pay is purchased than before.

Alle's **reservation price** for joining an income security club is the price, M, which sets the expected value of lifetime membership in the club equal to that of non-membership. That is to say, M is the price 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:

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

or substituting,

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

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

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

[5] To see this mathematically, use the implicit function differentiation rule on equation 7b which yields: $dW^{S*}/dS = (dZ/dS)/(- dZ/dW^S) = \{U^S_{YY}[(1-t)\ \omega + t\omega\ /PN] - U_{LY}\}/ -U^S_{WW} < 0$. The denominator is simply the negative of the second derivative of equation 6 with respect to W, which will be positive if the utility function is strictly concave. The two terms in the numerator are both negative because a utility function that is strictly concave has negative second derivatives and (normally) positive or zero cross partials. All the terms in the bracketed term multiplying U^S_{YY} are positive. QED.

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.

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

$$M_S = [P(U^{S}_{L} - U^{woS}_{L})] / [- M] < 0 \quad (14.2)$$

$$M_t = [(1-P)U^{H}_{Y} (- \omega Wi^{H*}) + P(U^{S}_{Y} (\omega WAve - \omega Wi^{S*})] / [- M] <> 0 \quad (14.3)$$

Alle's willingness to pay for club membership increases as the probability of being sick increases, and it decreases as the loss from declines (H-S). However, it may increase or decrease with the extent of the dues paid in according to whether the higher guarantee is more valuable than the higher dues that must be paid. (Recall that $\omega WAve > \omega Wi^{S*}$ if wage rates are similar among members, because the average workday is greater than the workday when ill. The two terms with negative terms in front of them are the marginal cost of continuing membership and the one with the positive term is the marginal benefit from the dues associated with membership.

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 reservation 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 $G = (t \omega \Sigma Wj)/N$ which, when N is large, can be written as $t\omega [(1-P) w(H, \omega, t, N) + Pw(S, \omega, t, N)]$. **The income guarantee is the average amount of tax revenue collected.**

Only if $[(1-P)U^{H}Y (\omega W^{Ave} - \omega Wi H^*) + P(U^{S}Y (\omega W^{Ave} - \omega Wi S^*)] > 0$ 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 $[(1-P)U^{H}Y (\omega W^{Ave} - \omega Wi H *) + P(U^{S}Y (\omega W^{Ave} - \omega Wi S *)] < 0$ 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. Such clubs were quite common during the late nineteenth century in the United States.

Reasons to shift from self-financed to tax-financed insurance

Preferences to shift from private to tax financed provision would be driven by the expected effect on the cost of the program (tax payments rather than dues) and the level of the sick pay or other insurance benefits provided.

A shift from private clubs to government supplied insurance may occur because private clubs are unreliable, because of progressive taxation which provides average and 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 (moral hazard problems). Another factor may be changes in ideas about "the good society" (e.g., ideological shifts) that tend to favor more equal access to the insurance product of interest, a more paternalistic attitude toward provision, or simply a preference for governmental provision over private provision (possibly because more voters come to trust governments than trust markets to honestly and efficiently provide the service). The reverse may occur when voter-consumers reach the opposite conclusion in cases in which the policies are decided by electoral outcomes, although this has so far rarely been observed.)

IV. Electoral Support for Redistribution/Transfers

The demand for tax-finance transfers can be considered either a result of altruistic voters that favor transfers because of their altruism or for ideological reasons. Or, it may be considered the result of the private interests of the net-recipients of those receiving the transfers. If all voters are altruists, transfers have some of the properties of a pure public good, in that there are free rider problems that tend to generate fewer transfers than would maximize the joint benefits from transfers. In cases where the motivation is more pragmatic, the level of transfers undertaken can be too large in the sense that they undermine incentives for productive activities and retard economic growth. Electoral based models of both motivations for transfers have been undertaken. Hockman and Rogers (1969) undertook the analysis of the extent to which altruistic voters would favor

transfers.[6] Meltzer and Richards (1981) provide a small general equilibrium model of voter choices over transfers (in the form of demogrants) in a democracy. This section of the chapter focuses on the implications of a slightly simpler version of the Meltzer-Richards model.[7]

The electoral effect of the pragmatic demand for transfers varies with the distribution of marginal benefits and costs of such programs, which vary with the distribution of income in the polity of interest and with the deadweight cost of the taxes used to finance the transfer system. The Meltzer-Richard model assumes that essentially the entire governmental budget 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, as individual substitute leisure for labor. National income is 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-taxpayers, and Y is national income.

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[6] 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.

[7] A third type of transfer takes place as the consequence of interest group activities. These are normally smaller targeted transfers (often in the form of subsidies or tax preferences) favoring particular interest groups—both ideological and economic interest groups. Such transfers are taken up later in the course, when we analyze rent-seeking activities. The Olson (1965), Tullock (1981), and Becker (1983) papers have a similar "extractive" implications about transfers from the public purse to special interest groups that compete with each other for direct transfers and indirect transfers. Interest group models regard transfers to be the results of rent seeking activities.

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 taxpayers, 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 $\mathbf{U = u(\,Ci)}$.

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 $G^*=tY^A(t^*)$.

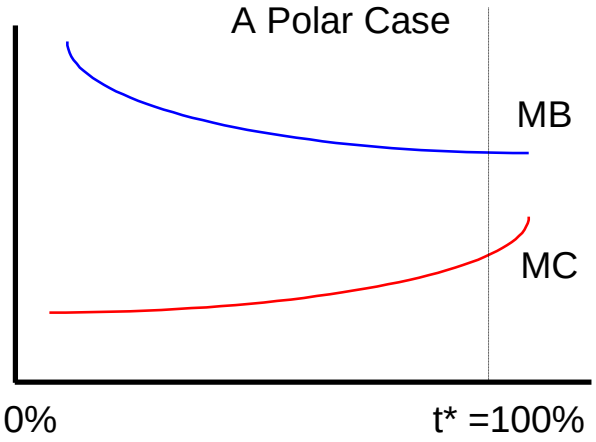
Note that the first order condition that characterizes t* can be written as:

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

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.[8]

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, who in this case prefers confiscatory taxation and redistribution.

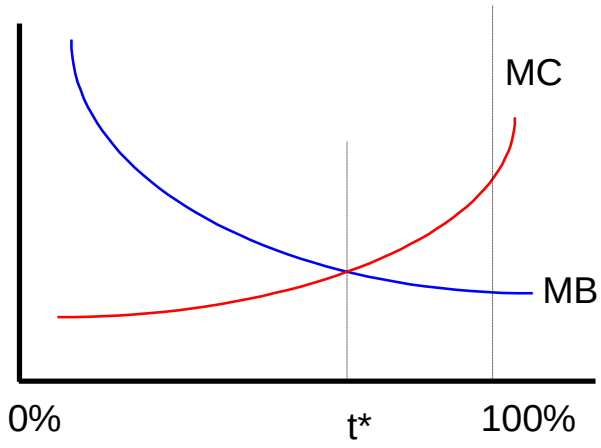
[8] Benebou (2000) suggests that such programs may actually increase, rather than reduce, economic growth if there are large imperfections in credit and insurance markets. This effect would have to be large enough to dominate the labor leisure tradeoffs of typical middle-class voters.



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. 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 or 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 tends to reinforce tendencies for confiscatory tax and transfer systems.

V. The Observed Demand for the Four Types of Government Services

All four types of demands are evident in most democratic governments: demands for private goods, public goods, social insurance, and transfers. 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 that are arguably pure or near pure public goods. Since that time, there has been a systematic shift toward various insurance-like products such as tax-financed pensions and healthcare (or payments for healthcare) and also toward transfer payments.

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 were a reasonable characterization of central government spending in 1954 when Samuelson wrote his classic piece on the optimal provision of a pure public good, but it is no longer the best explanation for the pattern of observed government expenditures.

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