CENTER FOR INSTITUTIONAL REFORM AND THE INFORMAL SECTOR

University of Maryland at College Park

Center Office: IRIS Center, 2105 Morrill Hall, College Park, MD 20742
Telephone (301) 405-3110 Fax (301) 405-3020
http://www.inform.umd.edu/IRIS

FAILURES IN GOVERNANCE:
RESTRICTIONS ON THE DOMINION OF MARKETS

May 1999

Martin McGuire

Working Paper #223

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[IRIS Conference on "Market Augmenting Government" March 1999]

Martin C. McGuire[1]

Olson's Idea of Market Augmentation

Two singularly lucid articles written 40 years ago summarized the then accumulated[2] wisdom of welfare economics as to when and whether a government should intervene in the allocative workings of the private economy. In the first, Paul Samuelson (1954) showed how allocative efficiency required that the government accept sole responsibility to provide some types of goods for which markets were ***absent*** altogether --- Public Goods which (it is only a mild exaggeration to say) the market economy would neglect totally. In the second "The Anatomy of Market Failure" Francis Bator (1958) set the parameters for how economists would judge the private allocative assignment of the government for intervening in ***existing*** private markets for a generation. "Failure by enforcement", "failure by incentive", "failure by signal," and "failure by structure." Each was a deficit in markets occasioned by a specific fault, and to be corrected with a specific mechanism.[3] While there have been many important advances[4] in our understanding of these two categories it remains true to say that economists essentially divide the allocative role of government into the two categories to this day --- ***provision*** of public goods by the Government and ***regulation*** of private good markets.

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[1]Clifford S. Heinz Professor of Economics, University of California-Irvine, Irvine Ca, 92697. mcmcguir@uci.edu. I thank Omar Azfar, Roger Betancourt, and Ke-Young Chu for helpful comments

[2]Accumulated from debates on the price system, regulation (Pigou 1920), and the socialist economy (Lerner, 1944).

[3] "Failure by structure: is monopoly to be corrected by increases in numbers of firms or regulation which attempts to mimic the effects of increased numbers; "failure by enforcement refers to unpriced common assets such as highways or common resources to be corrected by congestion or externality taxes, subsidies, marketable permits and such like; "failure by signal" identifies the problem of insufficient size of demand relative to cost and is to be corrected by subsidy or multi-part tariff; and "failure by incentive" refers to non-convexities which preclude attainment of profit maximization by means of marginal cost pricing.

[4] Advances in mechanisms for collective good provision particularly in the realms of incentive compatibility and honest preference evoking mechanisms deserve special mention, as do discoveries about asymmetric information, self selection and moral hazard in understanding private markets.

Into this picture place Mancur Olson.[5] Forty years later Olson calls our attention to the idea that effective functioning of private markets itself is a collective good, and the better functioning they are the more public benefit do they provide.[6] It follows that increasing the proper reach and effectiveness of markets is to provide a return for **all** in the society, especially (but by no means solely) for each those who participate directly in each private market, and that this is an augmentation of welfare worthy of being an objective of government --- whence his turn of phrase and the title of this conference. Olson would, in all likelihood, have wanted to include our other modern prescriptions for correcting market failure under the umbrella of "market augmentation." But he would want "market augmentation" to go beyond those widely acknowledged corrections of market failure, thinking that somehow our accepted classification left something important out.

Completely and Perfectly Augmented Markets

To bring this idea into focus we might ask ourselves "what constitutes a perfect or ideal market?" From a welfare and developmental viewpoint a perfect market permits all voluntary exchanges - however indirect and intermediated by other voluntary exchanges - - of mutual benefit to buyers and sellers, all exchanges of goods assets and services, of promises to perform or refrain from performing of all kinds. Not only this, a perfect market also would allow or insure that all the **relevant marginal benefits and costs** occasioned by each voluntary transaction would figure in the decision of buyers and sellers, would in the vocabulary of economics be "internalized" in the decision calculus of buyers and sellers. And this might be achieved by various types of government actions - - definition of property rights, imposition of externality taxes etc. Moreover, a truly ideal market would also have the property of being not be more expensive to establish, operate, and maintain than the

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[5] Mancur Olson, *Ernest Sturc Memorial Lecture*: "Why Some Nations are Rich and Others Poor," Johns Hopkins University, School for Advanced International studies, Washington DC. November 6, 1997.

[6] This idea was implicit in Olson's early observation that price in any ordinary, atomistic, competitive markets is a public good for the individual buyers and sellers in that market (***The Logic of Collective Action***, 1965, p. 9)

aggregate surplus benefit it allows to buyers and sellers, **and to others who may benefit from the existence and operation of markets in addition to the buyers and sellers in any one market.** That is, a market itself conveys an external economy to society over and above the benefit it procures for those who make immediate use of it.

It is precisely the uniformity, non individuality, institutional nature of ideal markets which constitutes such a powerful public good for so many way beyond the individuals who actually participate one by one in buying and selling. It is this institutional feature by which markets announce information about others' wants and needs, inform about scarcity, permit planning and decentralized coordination. This is really the public good benefit which market augmentation seeks to procure. And because it is a public good benefit shared by all, private free-rider riven efforts to supply it will always be insufficient and sub-optimal. In sum, "market augmentation" is essentially and necessarily a collective, government function. It is this public benefit which is the focus of this paper.

I
Private Benefits, Government Failure, and the Forces which Limit Market Augmentation

But although the public benefits of market augmentation may be vast, it is unlikely that they will be unalloyed with redistributions of private benefits. If we ask "Why are markets truncated, restricted, falling short of ideal?" we will frequently find that the answer is "On purpose!" If the limit on markets is deliberate, effected for example by manipulation of government power, then some private parties benefit from these restrictions, and opening the markets up would harm them at least in so far as direct effects first round effects are concerned. That is distribution is a central factor in the creation of impediments in the first place, and the resistance to loss is the central explanation for the failure to correct truncation of the market in the second place. So one crucial effect of market augmentation will be not only to create value for everyone in the society, but also to redistribute income or welfare from some to others within the society which utilizes the markets so augmented. And herein lies the theme of this paper's reflection on the Olson idea: the relation between market augmentation and redistribution.

Specifically we will consider three categories of "Government Failure" to promote ideal market augmentation. All of these derive from a special redistributive benefit which a special interest obtains by inducing the failure. The first cause we will name "Failure in Representation" or "Failure by Redistribution Proper" - - -

these being two sides of the same coin really; the second we name "Failure by Predatory Discrimination;" and the third we will name "Failure by Corrupt Implementation."[7]

Failure in Representation

Under this category we will show how the desire of a government's supporters to redistribute income **to** themselves **from** the society at large will cause a government to restrict its market augmenting action - - - whence "**Failure by Redistribution**". As we will demonstrate presently if the government represents the entire society and this society accepts the market distribution of income as optimal, then redistribution will not be desired, and all tax collections will be allocated to market augmentation. But if, on the contrary, only a subset of those citizens who actually work and produce control the government, then as we shall also demonstrate, redistribution which can help that subset specifically will provide the government with an incentive to suppress market augmentation - - - whence "Failure by Representation". This source of this failure really is that market augmentation requires resources, and these may come from resource pools which the government has already reserved for the privileged and powerful. We ask how wealth re-distribution and productivity enhancement by means of market augmentation interact ***depending on whom the government represents***.

Failure by Discrimination

Under this category we identify how the market augmenting behavior of a governing majority (or any subset in power) of society will change when that group can discriminate as between *its own sector* and the remainder of economy at large. Such discrimination is possible both in the provision of market augmenting effort to different sectors of the economy and in the taxation imposed on different sectors. This will extend the assumption that the rulers can tax and redistribute to themselves. Now we will assume that they can also discriminate in the taxation they impose on themselves versus others, and can discriminate in their provision of market augmentation as between their "home" economy and a colony or satellite economy. By doing this we will

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[7]Not all limitations on the optimal reach of markets are determined by design on purpose. Some market augmentation will simply arise from identification of and exploitation of opportunities to extend market which were not recognized. These might include: of property definitions, contract enforcement mechanisms, and other prior requisites to exchange, lack of knowledge that underlying wants exist, lack of technology to create market institutions, for example communications technology, existence of legitimate costs which overwhelm private benefits from market operations --- costs such as transportation cost lack cultural or conventional proscriptions about legitimacy of benefits and therefore of transactions, cultural or conventional habits and superstitions which reduce communication and interfere with market sustaining expectations. The might be labeled "Failure by Ignorance."

illuminate how ethnic identities/rivalries and the consequent creation of recognized minorities or underdogs provide an opportunity and rational for curtailing market augmentation.

Corruption: Failure in Implementation or by Competition

Here we will compare the effects of erosion of a government's monopoly tax power, with the effects of degradation of its ability actually to deliver market augmenting public goods. Specifically I want to examine how these *different categories of corruption* change the performance and outcome under *different forms of governance*. For example, is an autocratic form of governance more vulnerable to corruption in its tax collection system or its market augmenting public good provision?

Building on earlier work with Mancur Olson (McGuire-Olson, 1996, 1994, 1992) - - - hereafter "M-O" - - - this paper will focus on the allocative consequences of these three types of Government Failure comparing them in all cases with the ***optimal*** amount of market augmentation which a non redistributive, non discriminatory, non corrupt utopian/consensus democracy would implement. We first will summarize the basic M-O model which provides a structure for further analysis, making special use of their theorem that every realistic, semi-democratic government can be modeled as a linear combination of a perfect consensual democracy and a perfect enduring autocratic government which desires to maximize its redistribution.

II
McGuire-Olson: "Economics of Autocracy and Majority Rule"

McGuire-Olson considered how a perfectly efficient, utopian consensual democracy would supply productivity enhancing public goods --- such as resources, institutions, policies, and rules for market augmentation. A utopian democracy was defined as one in which all questions of redistribution among individuals had been settled so that the society could be modeled as a monolithic benevolent dictator. They next asked how this provision would compare with that of an enduring autocrat with an infinitely long lived dynasty and then how it would compare with the provision under other forms of governance such as majoritarian or oligarchic elite governance, or interest group driven, modern, semi-democratic society. Concrete examples of public goods in M-O include property right definition, contract enforcement, and protection against theft as examples of market augmentation which expand the productivity of the private economy. Of special relevance here is their notion that

the incentives facing all these many forms of government can be shown by a system of two simple (proportionately) independent relationships plus a descriptive parameter.

Market Augmentation

The first of these relations gives "market augmentation" in the creation of national income/product, modeled as a production function $Y = Y(L, G)$[8] which serves as numeraire with price $p = 1$. See Figure 1, where:

Y = aggregate output lumped into a single variable. The function Y(G, L) shows the net effect of increases in market augmentation (which might derive from sources listed directly above), with all effects of transfers among citizens which might be concomitant with G being netted out.

L = labor force and all other inputs to production assumed to be constant

G = Public factor inputs including for our purposes all market augmenting efforts/expenditures to be undertaken exclusively by the government. When convenient, G is assumed to be essential for any positive output as illustrated.

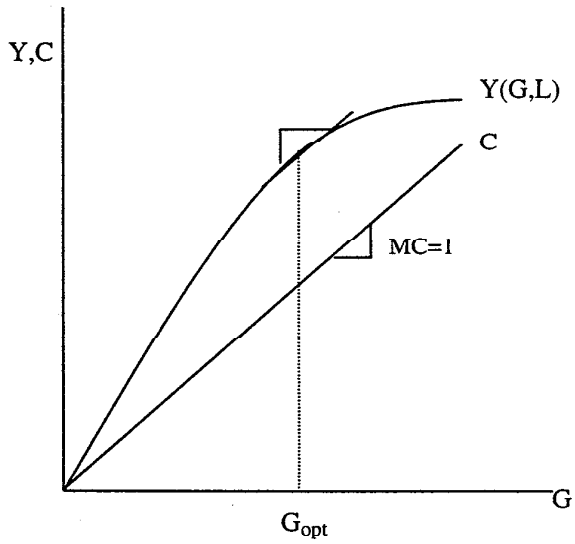

Figure 1

As Fig. 1 shows, if non-distorting lump-sum taxation were possible, the optimal provision of market augmentation would occur at G_{opt} where its marginal contribution to product MPG equaled its marginal cost of unity.

Tax Distortions

The second M-O relationship reflects an assumption that lump-sum, non-distorting taxation is impossible - - - thus that some sacrifice of market augmentation in at least some sector(s) is necessary to collect revenues - -

[8]Extension of M-O to allow variation in the private resource input --- L to include labor and other private inputs --- is accomplished in McGuire (1996).

- revenues themselves used in turn for market augmentation elsewhere in the economy. This assumption leads to a tax induced "efficiency loss function" or "deadweight loss function." See Figure 2, where:

1-r(t) = the *proportion* of Y lost due to incentive distorting taxation.

t = the constant uniform average (equal to marginal) rate at which output is taxed to obtain resources for tribute to the government and to finance the supply of G.

r(t) = proportion of Y remaining after deadweight losses.

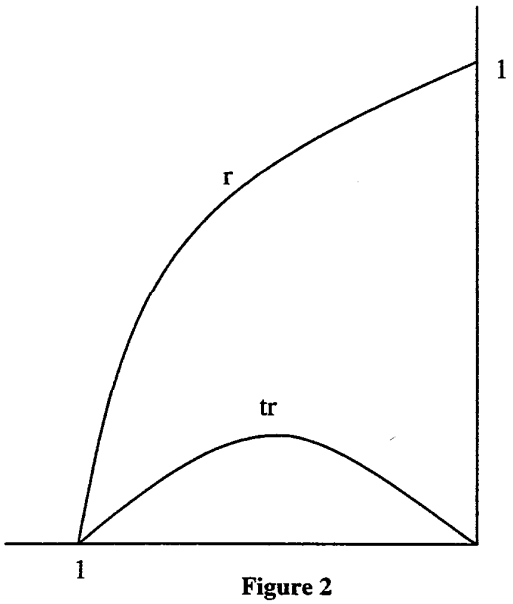

Figure 2

Fig. 2 also shows, as tr(t), the proportion of national income collected in taxes. When t = 0, or when r = 0 total collections are nil - - - which implies that t r reaches a maximum in the interior.

Overlap between Economic Ownership and Political Power

The third innovation in the M-O analysis is to devise a parameter to represent the form of governance on a spectrum ranging from perfect democracy to pure dictatorship - - - a parameter describing the relation between economic ownership and political power:

F = the fraction of the total income produced and earned in the market which accrues to the redistributive ruling interest

S = the *proportionate* share of the total actual production, rY, that the ruling interest receives, including it earnings and its receipts from redistribution.

The formula for its share is:

$$S = F + (1 - F)t \qquad (1)$$

The assumption that the deadweight loss from taxation and productivity of market augmentation are proportionally independent[9] allows aggregate actual national product, net of deadweight losses from taxation, to be written as

[9] Introduction of a second variable factor input which is supplied subject to the choice of the citizens - - for example labor

r(t)Y(G) --- where the L in Y(G,L) being a constant has been suppressed. Similarly, aggregate tax revenues can now be written as the simple product t· r(t)·Y(G).

Within the framework provided by this simplification M-O infer how a government's choice of t and G depends on the political organization of the society. Moreover, this neat r(t)-Y(G)-S(F, t) framework allows a simple graphical exposition of the incentive structures and relative outcomes of different forms of governance. Most importantly the analysis implies:

1. that modern semi-democratic regimes can be analyzed as a simple linear combination of two extreme cases: a purely selfish autocracy, and a purely selfless representative utopia.

2. that an inherent tendency exists for all regimes- - -autocratic, oligarchic, or majoritarian- - -to limit taxation because it erodes the efficacy of markets and the productivity of public good capital, G. It, therefore, erodes the return to the ruling interest's own labor and other private inputs.

These models and these insights bear directly on the analysis of failures of governance to which we now turn.

III
"Government Failure by Representation/Redistribution"
Trade-Offs between Market Augmentation and Income Redistribution[10]

Here we want to show how a government's incentive to redistribute conflicts with the incentive to provide for market efficiency. To do this we summarize and extend certain portions of McGuire-Olson. Since the claim asserted is that government manipulated redistribution of income erodes or reduces its market augmentation we will begin with an analysis of a society in which there is no redistribution - - - a "perfect society," in one sense, which we can use as a basis for comparison.

A Consensual Society: A Benchmark for Ideal Market Augmentation

Consider to start a society with a distribution that enjoys unanimous consensus. Assume that in this society each citizen pays a share of the cost of market augmenting public goods that is exactly proportional to his share of the gains (marginal and average) from the social order. We can use this ideal to examine public good provision in a Pareto-efficient society with no coercive redistribution of income, and to make welfare comparisons

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input - - will violate proportional independence and cause t to influence directly the productivity of G. The advantage of this elaboration is to introduce income effects which are absent from the M-O model by assumption. See McGuire (1996).

[10] This section of the paper draws extensively on McGuire-Olson (1994).

across regimes.[11] It is feasible for this "Lindahl Consensus" to collect more taxes than needed to finance public goods and redistribute the surplus to itself, but because it already has agreement about its income distribution, doing this would

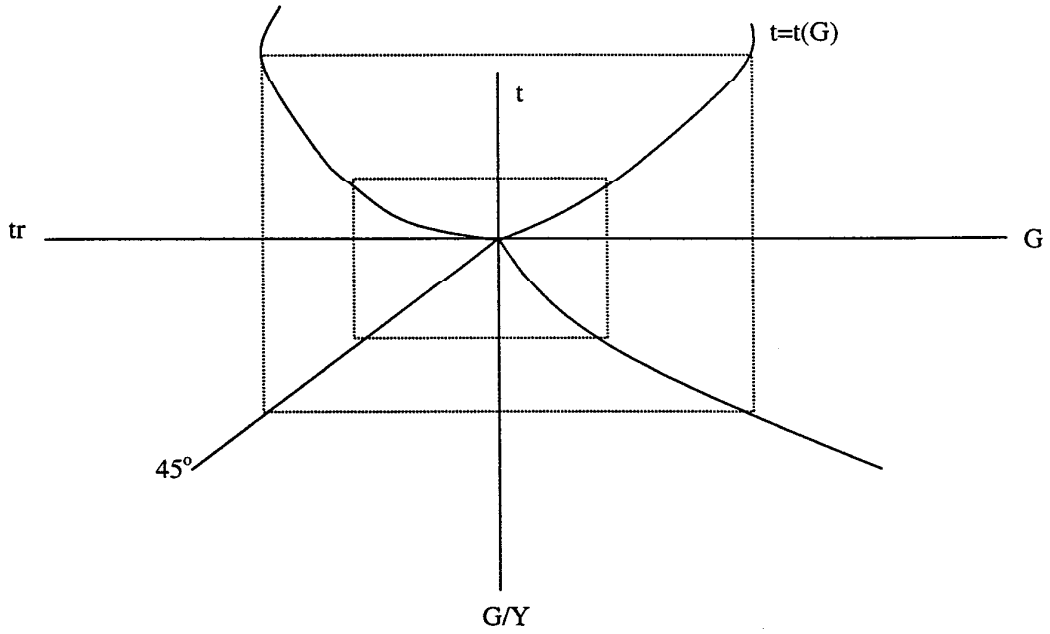


Figure 3
Derivation of t = t(G) from the given production and tax efficiency loss functions

cause deadweight losses from incentive-distorting taxation for no purpose. Accordingly, the Lindahl-Consensus society will choose to collect taxes only to provide the public good. We, therefore, can describe the Lindahl society as always proceeding on the boundary of the constraint tr(t)Y(G) - G = 0. This determines G as a function of t: G = G(t), or t = t(G). The dual relationships, t(G) and G(t) are derived graphically[12] in Figure 3. Each common value of t r = G/Y(G) shown in the third quadrant implies a specific G-t combination.

The welfare of the consensus society depends on post-tax income. One approach to its allocation problem is to ask the optimal value of t, with G thereby determined by G(t) derived above, under this approach this benchmark society maximizes (2). It chooses a tax rate so that, with all tax proceeds spent on G, the marginal

[11] Note that under Lindahl tax shares, every voter wants the same, socially efficient amount of the collective good. To maintain an assumption of a simple linear tax, we also assume either that all individuals are identical, or that Lindahl tax shares do not change as more or less of the public good is provided.

[12] Mathematically this is done by equating successively h(t) = t r(t) = G/Y(G) = f(G), to give $t = h^{-1}[f(G)]$ or

$$W = \underset{t}{Max}\,(1-t)r(t)Y[G(t)] \tag{2}$$

social benefit of the tax just equals its marginal **social** cost. Because it represents the entire society this government includes all social costs and benefits in its decision calculus.

An alternative way to characterize the consensual society is to focus on its optimal provision of G. This calls for formulating its social welfare maximization as:

$$U = \underset{G}{Max}([r(t[G])Y(G)] - G) \tag{3}$$

Here the variable of choice is G, with t = t(G) implicit from the constraint and therefore r = r(G). Either formulation -- (2) or (3) -- is sufficient to solve the entire problem for the consensual society, but with (3) marginal resource costs and marginal deadweight losses show up explicitly. The derivative of (3) with respect to G yields:

$$rY' + Yr'\frac{dt}{dG} - 1 = 0 \tag{4}$$

The marginal (pre-tax in this case) social cost of G consists of the direct unit resource cost plus Yr'dt/dG, the marginal deadweight loss of the tax necessary to net a unit of resources. Expression (4) therefore, shows how a consensus society takes account of <u>all</u> of the benefits of the public good. It is clear from (4) that the marginal costs of financing G themselves depend upon Y' (G). When the constraint tr(t)Y(G) = G is totally differentiated, solved for dG/dt = - Y[r +tr']/[trY' -1] substituted into equation (4), and then simplified we obtain the details of marginal benefits and cost and the relation between t and G that must obtain at the consensus optimum[13].

$$\frac{MSB}{r} = Y'(G) = \frac{r(t) - (1-t)r'(t)}{r^2} = \frac{MSC}{r} \tag{5}$$

or

$$MSB \equiv rY'(G) = 1 - (1-t)\frac{r'}{r} \equiv MSC \tag{6}$$

MSB stands for marginal social benefit of one unit of G, while MSC stands for the marginal cost of obtaining one dollar of resources and includes all deadweight loss effects. These relationships are shown in Figure 4.

$G = f^{-1}[h(t)]$, and $dG/dt = - Y[r + tr']/[trY' - 1]$.

[13] Second order conditions require $d^2[(1-t)r(t)Y(G)]/dt^2 < 0$; s.t. $tr(t)Y(G) = G$. Utilization of the expression for dG/dt, its derivative, and of Equation (13) simplifies this condition to: $-2(r')^2 + rr'' + YY''[(r)^2/(1-t)]^2 < 0$. Evidently, $r'' < 0$ may be sufficient but not necessary to ensure a maximum. Note that in MSB, r is constant, evaluated at the optimum value of t = t^*_N, and in MSC, r' = dr/dt, ***not*** dr[t(G)]/dG.

This analysis is a necessary beginning to understand how market augmentation and income redistribution interact. In a consensual society, distribution and market augmentation do not compete, so Failure by Redistribution is ruled out. Though the public good has a price or resource cost of 1, that is not its marginal cost to the Lindahl democracy. For this society -- and any society that does not redistribute income, and that therefore must raise the tax

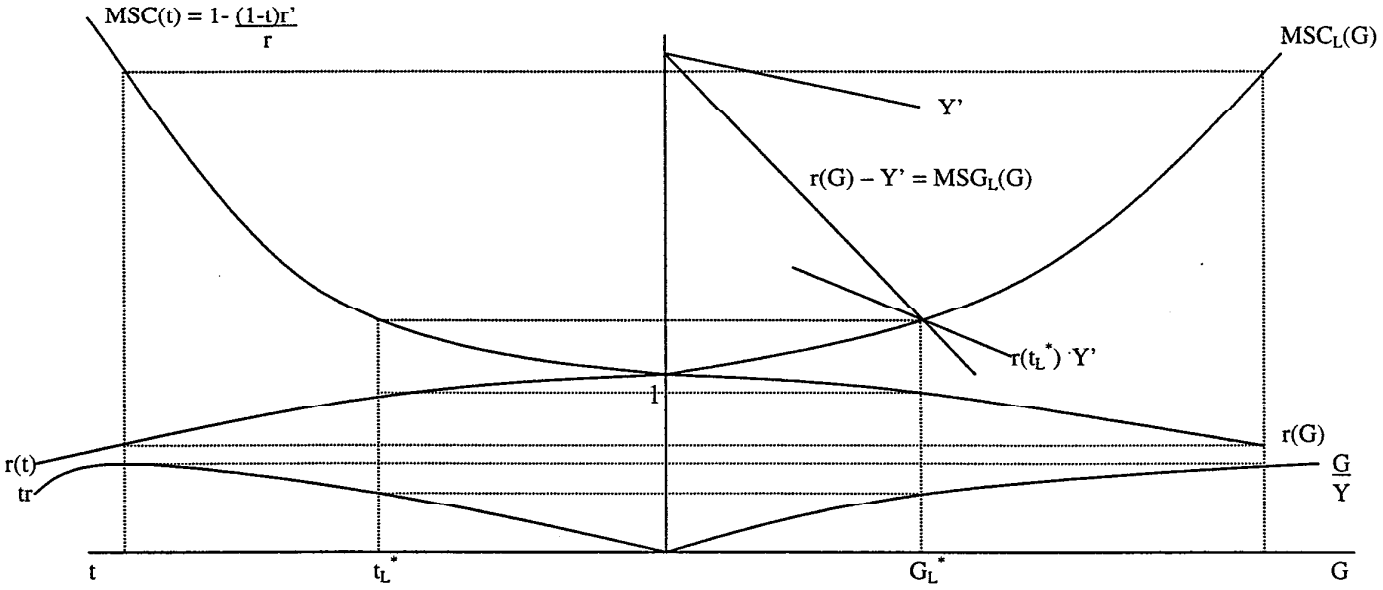


Figure 4

The second quadrant shows r(t) (r"<0 assumed), tax shares tr(t) at each tax rate as before as well as MSC/r from equation (6) and MSC from equation (7); for illustration these are drawn as increasing throughout. The first quadrant shows Y' and derives the two functions r[t(G)] and MSC[t(G)] which must obtain for every society which spends all its revenues on public goods like the Lindahl Society. For each value of t and therefore of r(t) and of MSC(t) in the 2nd quadrant, the corresponding value of G is read from t r = G/Y(G) in the 1st quadrant, with r(G) and MSC(G) thereby constructed. The 1st quadrant also shows the marginal social benefit of a balanced budget provision of G, i.e. r[t(G)]Y' = MSB(G). The Lindahl Society's optimum then is identified at the intersection of MSB(G) and MSC(G). The figure also shows for reference a marginal social benefit curve r*Y' where r* is evaluated at the optimum value of t = t*. This reference curve r*Y' is flatter than the MSB curve; i.e. r[t(G)]Y' is steeper because it includes the effects of G upon r by way of the budget balance requirement. The curve r(G)Y' is steeper than r(t*)Y' because to increase G taxes must be raised and deadweight losses increased. But with t fixed at its optimal value t* the consensus society's choice of G will occur where r* = r[t*(G*)], so the curves intersect at the optimal value. With the consensual society's choice of t and of G so determined where MSB(G) = MSC(t), the division of national product between tax collections which equal expenditures on G and citizens' consumption follows.

rate in order to obtain more of the public good -- the marginal deadweight losses from the additional taxation needed to finance more of the public good are part of its marginal cost. *It follows that the more easily taxation can be evaded and therefore the greater the deadweight loss to generate any given level of taxes, the lower is the incentive to augment markets, even in a perfect Lindahl consensus.* As will be evident from the next section this is not the case for any regime that redistributes for example for an autocratically ruled society.

Autocratic, Majoritarian, and Semi-Democratic Regime Incentives

Every redistributive regime will choose a higher tax rate than needed to finance a social order, including market augmentation. Therefore, when the government taxes to redistribute, this redistribution and market augmentation necessarily compete for resources. As we will demonstrate unlike the case of consensual societies, this competition for resources brings about a failure in governance , via "Failure by Distribution." We want to understand this failure better.

To do so consider the problem faced by the elite rulers or redistributing majority. Using the S-F-t parameter notation developed above, we represent the optimization problem of a governing interest as:

$$\underset{t,G}{Max} \quad (1-t)r(t)FY(G)+[tr(t)Y(G)-G]; \quad s.t.\, G \le tr(t)Y(G) \tag{7}$$

which is equivalent to

$$Max \;\; Sr(t)Y(G)-G; \quad s.t \;\; G \le trY(G) \tag{8}$$

The first term of this objective function in equation (7) shows the market income of the ruling majority after both deadweight losses and taxes, and the second term is the surplus that the majority transfers to itself. To generalize for both positive and zero redistribution the appropriate Lagrange function is:

$$(1-t)r(t)FY(G)+tr(t)Y(G)-G+\lambda\{tr(t)Y(G)-G\} \tag{9}$$

with Kuhn-Tucker conditions $\lambda[tr(t)Y(G) - G] = 0$, $\lambda \ge 0$, and $[tr(t)Y(G) - G] \ge 0$. First assume positive redistribution, i.e. that $trY > G$. Then $\lambda = 0$ and the first order conditions are:

$$F[-r+(1-t)r']+(r+t'r) \quad = \quad 0 \tag{10}$$

and

$$\{(1-t)rF+tr\}Y'-1 = SrY'-1 = \quad 0 \tag{11}$$

Condition (10) requires that the marginal cost of the tax (of dt) to the ruling or majority party -- the negative of the first term in (10) -- be equal to the marginal benefit from redistribution -- the second term. That is the majority/elite limits the deadweight losses it imposes on society because it bears some of these losses. Rearranging gives (12): as the tax rate is increased from t = 0, R(t) tends to fall; deadweight losses at the margin

$$F = \frac{r + tr'}{r - (1-t)r'} \equiv R(t) \tag{12}$$

(the denominator) increase; marginal gains from redistribution (numerator) decrease. The majority/elite increases its tax rate until R(t) falls to where it equals F. For t such that R > F the marginal benefits of further redistribution to the rulers exceed the marginal costs and therefore taxes are increased. For R < F the opposite holds.

The redistributive majority's incentives are pictured in Figure 5a, and so the tendency for interest group beholden governments to limit taxation short of complete confiscation. The majority's total income is given by adding its market income, FrY(G), to the redistribution it exacts from the minority, (1-F)trY(G), giving a combined income share of Fr + (1-F)tr = rS = *S*. The redistributive majority maximizes its proportionate share of realized output irrespective of the amount of public good it decides to supply. This maximum of *S* and the optimal redistribution from the minority to the majority occur at the tax rate, t_R^* which we derive from equation (10):

$$t_R^* = -\frac{r}{r'} - \frac{F}{(1-F)}; \; F \neq 1 \tag{13}$$

Equation (13) implies that the larger a majority's fraction F, the lower will be its optimal tax rate. It also shows that a majority or other ruling interest that earns some of the society's market income necessarily levies lower taxes than an autocrat does, since F = 0, for an autocrat. Observe also that every redistributive regime --- an autocrat or a ruling elite --- will choose an optimal tax rate independently of its decision on how much G to provide. Because

we have assumed that the proportional deadweight social loss, 1-r(t), is independent of public good supply, this market augmentation does not enter into equations (10), (12), or (13).

Having chosen the tax rate to give optimal redistribution, the ruling interest then chooses its optimal public good level.[14] That is, having taxed, a redistributive regime will provide G out of its infra-marginal tax receipts. Therefore, marginal private cost of G to a redistributive regime does not include deadweight losses from taxation; for every redistributive majority, including autocrats, its marginal **private** cost of G is simply the direct unit resource cost. This decides how much market augmenting public good a redistributive interest will provide. The majority's marginal **private** benefit from G is given by equation (11) as SrY' which it equates to its marginal **private** cost of 1.

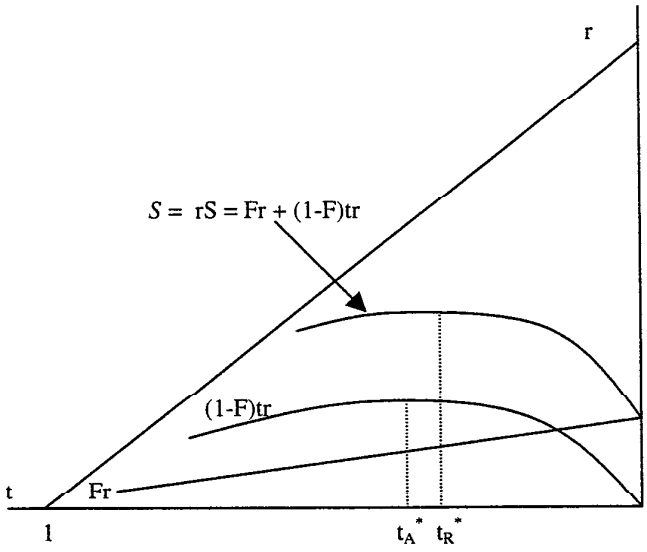


Figure 5a

With this model we can now understand how a redistributing elite's reduced provision of market augmenting public goods represents a **failure** in governance. To appreciate this, consider the relation between Marginal Social/Private Benefits (MS/PB) and Marginal Social/Private Costs (MSPC) when the resource allocation agenda is controlled by a ruling interest - - - smaller than the total society which obtains under a Lindahl consensus - - - a ruling interest which makes allocations based on its own private benefits and costs not social benefits or costs. At this majority's optimal value of G, MPB = SrY'(G) = 1 -- or equivalently MSB = rY'(G) = 1/S. That is, when the majority provides G until it's marginal ***private*** benefit (MPB) equals its marginal private costs or 1, at the same point, rY', i.e. society's marginal social return (MSB) = 1/S. But at its optimal tax rate the majority's

[14] Of course, the best tax rate and best public good provision depend also on the specifics of Y' (G), and 1- r(t) . For an analysis which incorporates an interdependence between allocation and redistribution see McGuire (1996).

chosen 1/S also equals MSC --- consistent with equation (14) --- because the redistributing majority also nets S % of tax revenues. This follows from combining (10) and (11) to obtain (14), and (15). Note that (14) for the majority elite has the same functional form as (5) for the Lindahl Consensus.

$$\frac{MSB}{r} = Y' = \frac{r-(1-t)r'}{r^2} = \frac{1}{rF+(1-F)tr} = \frac{MSC}{r} \tag{14}$$

or

$$MSB = rY' = \frac{1}{F+(1-F)t} \equiv \frac{1}{S} = MSC \tag{15}$$

A ruling elite, acting strictly in its private selfish interest, chooses a value of G such that the Marginal ***Social*** Benefits of G *given* the tax rate t^*_R equal the Marginal ***Social*** Costs of G which that tax rate t^*_R imposes on the entire society. That is, at its optimal tax rate the majority's chosen 1/S also equals MSC, so that we can generalize (15) as applicable to all regimes, Consensual, Autocratic or in between. This is shown as:

$$Marginal\ Social\ Benefit\ = \frac{1}{S} = Marginal\ Social\ Cost \tag{16}$$

The Lindahl Consensus, chooses a *lower tax* $t^*_L < t^*_R$, and therefore generates a lesser MSC of resources than does a ruling elite. $MSC_L < MSC_R$. But the Lindahl Consensus also provides *more* market augmenting public good even at this lower tax, so that the Marginal Social Benefit of G is less than under a ruling elite. $MSB_L < MSB_R$. Figure 5b shows the choice of G by the ruling elite, and illustrates how it implicitly chooses: (1) a higher MSC than the Lindahl Consensus, (2) a higher MSB, and (3) a lower value of G. (A striking implication of this model is that ruling elites with sufficiently broad ownership stakes in their economies will undertake no redistribution whatever, and will treat those with no power and allocate resources the same would an idealized consensus democracy. For further discussion see the Appendix to this paper).

The foregoing extensions of McGuire-Olson basically demonstrate how the incentive to redistribute from the powerless to the powerful, creates a ***failure in governance***. This is the first of the three governance failures to be identified here - - - a "Failure by Redistribution" and a suboptimal provision of those public goods which support a social order with its vast enhancement of the private economy.

We now can use the methods just developed to extend the model. We will find that the t-r-Y(G)-F-S framework has a direct application to the two other sources of government failure --- failure by "Predatory Discrimination," and failure by "Corruption."

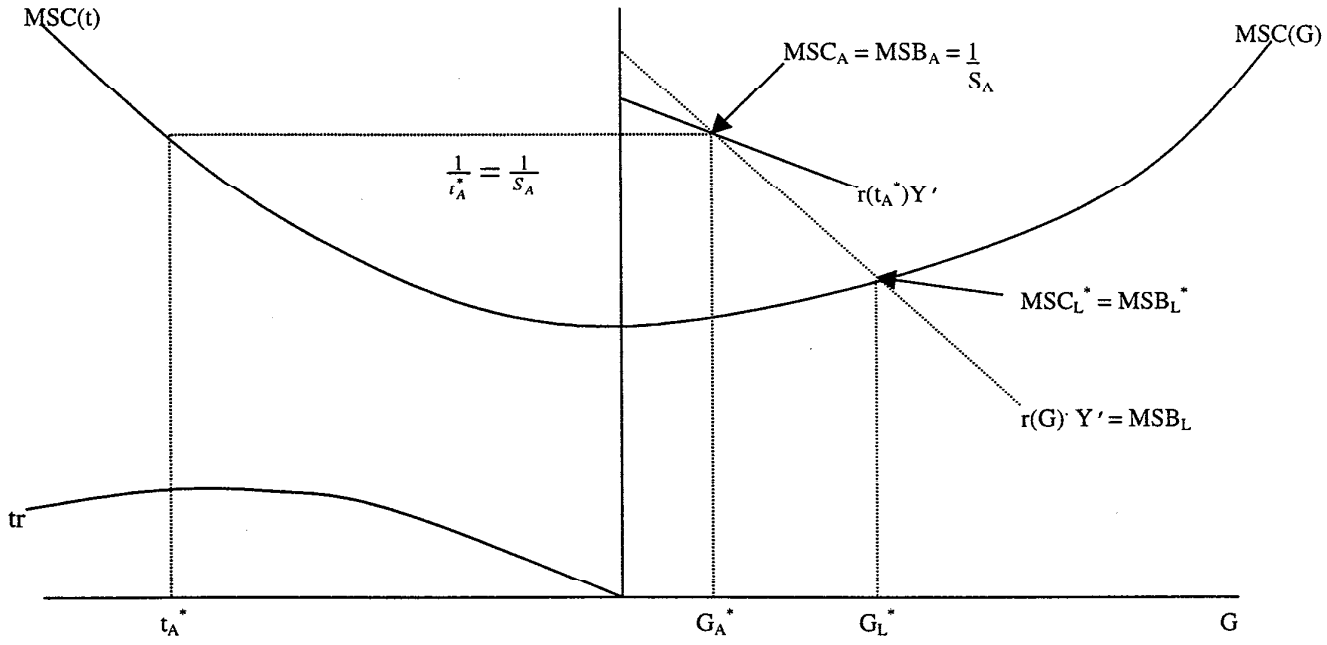


Figure 5b
An Autocrat's choice of G and of t compared to choices of a Lindahl Consensus

IV
Tax Differentials and Failure by Discrimination

First we employ and extend the foregoing argument to the next of the three impediments to ideal market dominion, namely inter-group discrimination in taxation and public good provision discrimination within a single Political Economy. The majority elites described above although "predatory" in some sense are restricted by technology and by information in their predation. Because the basic M-O model assumes one integrated economy predatory elite or a predatory majority cannot differentiate among various beneficiaries of the market augmenting public goods. Thus the provision of G in the basic model benefits everyone indivisibly --- a technological limitation which prevents the rulers from applying selective market augmentation to their favored support. Secondly the basic model precludes discriminatory taxation by assumption. Because of lack of information, the

ruling elite is unable to tax its own support less than others. This section of the paper corrects these two shortcomings, because especially in environments where economies are driven by ethnic divisions and where the ruling elites are drawn from one ethnic group at the expense of others, it may be easily possible for the ruling classes to discriminate both in taxation and in public good provision. (This point is developed further in Omar Azfar's comments.)

We will specifically focus on an extreme case --- **"internal colonization,"** which is used as a first proxy for the many cases of national, ethnic and tribal discrimination within the borders under the control of a single government. Typically this will be a government which represents or is controlled exclusively by one national, ethnic or tribal group, yet has tax and expenditure authority over one or more distinguishable different sub-populations. I take colonization because it is an extreme form of discrimination between the power elite group and the rest of the citizenry and thus establishes a point of departure for less clear cut discrimination between those in power who own a share of the productive resources of the economy and the remainder of the citizens who own the rest of the economy but have no power to tax, sustain a social order, nor to redistribute to themselves.

Suppose, therefore, a unified consensual, "home" country controls a "colony" within its own borders. All citizens of the colony taken together are assumed to be a unit. Production in each sector of the country's economy --- denoted "H," for the home country and "C" for the colony --- is assumed to depend on the labor and other material private inputs available in each sector , and on the degree of market supporting infrastructure and market augmenting expenditure, $G^k = G^H, G^C$ provided to each. The home government will provide both G^H and G^C from the taxes it imposes on the home population and on production in the colony. The provisions of G^H and G^C apply strictly within each sub-economy. (Presently we will postulate G^N which augments both home and colonial economies indivisibly, but we begin with only local public goods G^H and G^C). The elite governments can also tax each sub-population differently --- deciding on $t^k = t^H, t^C$ --- collect the aggregate tax revenues, and then allocate them among three purposes: (a) provision of G^H, (b) provision of G^C, and (c) transfers to the home population. As in M-O we assume that average and marginal tax rates imposed on either population although different for different populations are constant within each. Moreover, take Y(G) as numeraire, and assume that the price of

G, G^H, and G^C are constant at unity. For simplicity and to avoid prejudicing of the results, here it is assumed that the production $Y(G^k)$ and deadweight loss functions, $1 - r(t^k) : k = (H,C)$ are the same in the home sector and in the colony --- that is the functions are the same although the realized values will differ. Market augmentation in both sectors --- represented by expenditures on G^H and G^C may increase trade between the two sectors, integrating their economies, but that aspect is only modeled implicitly in this first stage. We later will explore the implications if some types of public good or market augmentation are non-excludable and non-rival ***across*** sectors. But our initial setup resembles two isolated economies governed by the same authority.

Comparisons between the Home government's treatment of its own citizens and those of its colony will naturally depend on the type of governance at home. For example, if the Home government were a selfish Autocrat (with F = 0) then its treatment of its colony would be no different from treatment of its own population, since the home population is in effect just another colony. Therefore, to make the problem interesting and the contrast more stark we will assume that the objective of the home government is to maximize the welfare of its own home population. If it taxes its own people, excess burden or deadweight loss will inevitably follow, directly reducing home income and consumption. If the home government taxes the colony, the colony's product will decline through the vehicle of deadweight loss, and the home government's tax base in its colony becomes eroded and its tax revenue declines. The optimal level of taxation, and optimal investment in market augmentation at home and in the colony therefore depend on how all these factors interact with one another. To capture this idea we write W for the home government's welfare objective:

$$\underset{t^H, t^C, G^H, G^C}{Max} \quad W = r(t^H)Y(G^H) - G^H + t^C r(t^C)Y(G^C) - G^C \tag{17}$$

W consists of home production eroded by efficiency losses from home taxation (if there is any positive taxation), plus tax collections from the colony whose production has also been eroded by taxes --- reduced by expenditures on home and colony market augmentation. This objective function is maximized subject to the constraint that revenues equal or exceed outlays on market augmentation, written with the Lagrange coefficient, λ:

$$\lambda[t^H r(t^H)Y(G^H) + t^C r(t^C)Y(G^C) \geq G^H + G^C] \tag{18}$$

The sum of terms on the left are tax revenues, and on the right expenditures on G. The home government will

distribute any surplus directly to its citizens. Kuhn-Tucker conditions yield $\lambda = 0$ if Tax Collections exceed ΣG^k. In this case it must be that $t^H = 0$ because for $t^H > 0$ the home government is simply taxing its own citizens and distributing the proceeds straight back to them. But this would be wasteful because of the deadweight losses caused by taxation; taxes could be reduced keeping ΣG^k at the same value, which would increase H's net income because of a reduction in the deadweight loss of self taxation, i.e. because:

$$d[r(t^H)Y(G^H)]/dt^H < 0 \tag{19}$$

Accordingly there are two cases of interest:

(a) when the home government taxes its own people $t^H > 0$, then no direct tribute is collected from the colony, ie $\Sigma G^k = \Sigma R^k$, where R^k indicates tax revenue obtained from sector k = H, C; and

(b) when the home government imposes no tax on its own citizens i.e. $t^H = 0$, and $\Sigma G^k < \Sigma R^k$, meaning that excess revenue is collected from the colony over and above that needed for public good provision, so that a surplus remains to transfer directly to home citizens.

We now compare values of t and G chosen for home and the colony in each of these two situations.

Case I: Indirect Cross Subsidy from the Colony to Home, Balanced Allocative Budget, and No Direct Income Transfers: $\lambda > 0$; $t^H > 0$; $\Sigma G^k = \Sigma R^k$.

Here the home country taxes itself to contribute partially to the provision of market sustaining public goods. Necessary conditions for a maximum for each indicated variable in (18) plus (19)--- are:

t^H: $\quad r_t^H + \lambda[r^H + t^H r_t^H] = 0$ (20)

t^C: $\quad [1 + \lambda][r^C + t^C r_t^C] = 0 \Rightarrow [r^C + t^C r_t^C] = 0$: {Autocratic taxation} (21)

G^H: $\quad r^H Y_G{}^H - 1 + \lambda[t^H r^H Y_G{}^H - 1] = 0$ (22)

G^C: $\quad t^C r^C Y_G{}^C - 1 + \lambda[t^C r^C Y_G{}^C - 1] = 0 \Rightarrow t^C r^C Y_G{}^C = 1$: {Autocratic provision of G^C} (23)

First note that at this level of aggregation the **home country treats its colony, just the same way an autocrat would treat a subject population**, assuming an enduring permanent colonial status. With respect to taxation of the colony we can see this equivalence from equation (21); the home country extracts the maximum share possible from its colony's economy. It should not over-tax the colony; such would destroy the tax base. Instead the home country places its colony as far as taxation is concerned at the peak of its "Laffer-curve."

Similarly, the home country under-invests in the colony as shown by equation (23); it invests the same amount as a selfish dictator would invest in his subjects. But this investment in market augmentation is not zero in the colony, rather it is sufficient so that the home country receives back in taxes at the margin just the amount of outlay required to support market augmentation --- ***just as would an autocrat in a single home domain.***

Equations (20), (22) show tax and expenditure policies applied to home citizens. First from

$$[r^H + t^H r_t^H] = - r_t^H/\lambda > 0 \tag{24}$$

or

$$\lambda r^H = - r_t^H(1 + \lambda t^H) \tag{25}$$

we infer that home taxes itself less than would an autocrat since $- r_t^H > 0$ and therefore $t^H(*)$ --- i.e. the equilibrium or maximizing value of t^H --- falls short of the value of t^H which an enduring autocrat would choose for Home. (Because an autocrat's value of t^H would be such as to set (24) equal to zero). The exact amount of home taxation depends on the productivity of public goods/market augmentation. The effects of G, Y(G) and Y'(G) are buried in the parameter λ for determining the Home country's Lindahl-like selection of t^H and provision of G^H. But with identical DWL functions and identical Y(G) functions both at home and in the colony, the tax rate at home is less than in the colony even while the provision of market augmenting public goods is greater at home than in the suppressed, colonial sector. We can see this from combining equation (22) with (25):

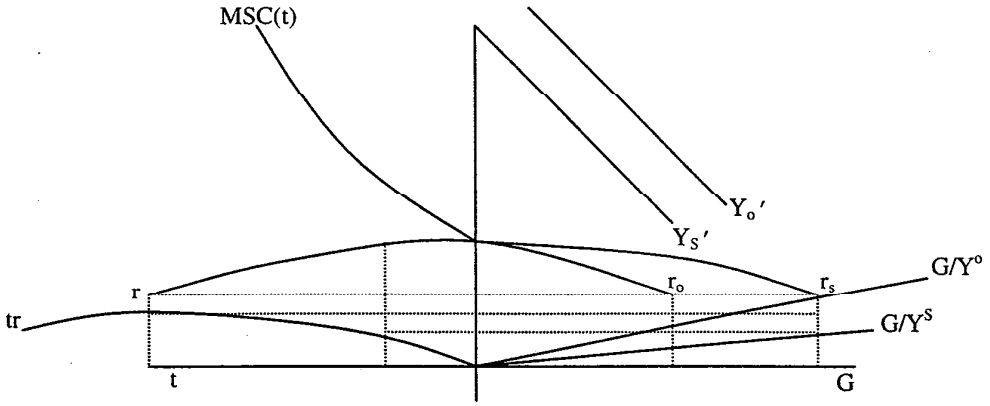
$$\frac{\lambda}{1+\lambda} Y_G^H = - \frac{r_t^H}{(r^H)^2}; \quad \lambda > 0, \; r_t^H < 0 \tag{26}$$

Since $\lambda > 0$, it follows that $0 < \lambda/(1+\lambda) < 1$. Contrast this with $Y_G{}^C$, obtained from equation (23), i.e. $Y_G{}^C = 1/t^C r^C$ and $t^C = - r^C/ r_t{}^C$ from (21). Combining these for comparison gives:

$$Y_G^C = - \frac{r_t^C}{(r^C)^2} \tag{27}$$

Although the Lindahl Home government will tax its own citizens less than its colony, inferences as to the effect of discrimination against a colony on the provision of <u>self-funded</u> G at home are ambiguous. Home's autocratic, surplus maximizing choice with respect to its colony procures for it a lump-sum start-up endowment of G for which it pays nothing. To see the effect of this endowment on Home's self-funded provision of G one must begin with the pre-discrimination supply of G by Home's government. This will depend the organization of Home's

society whether it is an autocracy, a utopian consensual government, or a mixed, interest group driven, semi-democracy characterized by parameters F and S. Figure 6 gives a diagrammatic solution for this problem starting



The endowment of public good financed by revenue from the Colony lowers deadweight losses for any amount of self- financed public good, but also lowers productivity of self financed G because of diminishing returns to G. Therefore, the pre-discrimination ("o") outcome under a Lindahl Consensus Government may entail greater or less G than after the Home country has taxed of its Colony ("s").

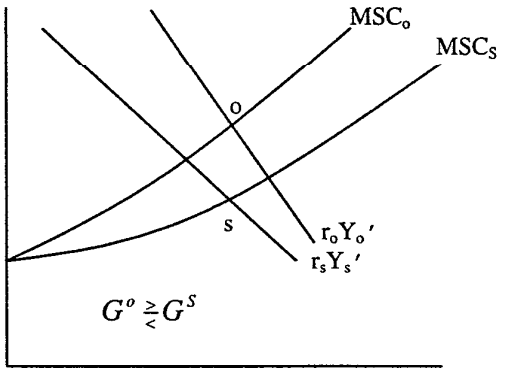


Figure 6

with the base line case where Home is a utopian consensus with no colony. It then shows the effect of a lump-sum grant from a colony, G_o^H, on the consensus society's choice of self-funded G, G_s^H, and therefore its choice of total $G^H = G_o^H + G_s^H$. The lump-sum transfer from the colony reduces Y_G^H, the marginal productivity of G $_s^H$ in H, but at the same time (because it boosts output in H) lowers tax rate necessary to finance a given G_s^H. These two effects work in opposite directions, so that a lump-sum receipt of G_o^H may increase G_s^H or decrease it. In fact, if the surplus which can be extracted from the colony is great enough --- depending on productivity of G there and on the deadweight loss function 1 - r(t) --- Home may reduce its self-financed provision of G even below the amount a Home Autocrat would provide. (From (26); if l is sufficiently small it may be satisfied at a

value of $G^H = G_o^H + G_s^H$ smaller than would obtain under a home autocracy). Nevertheless, the home country will definitely increase its aggregate provision of public goods/market augmentation capital as a result of exploitation of its interior colony, and that domestic colony will definitely enjoy a lesser amount of market augmenting public goods than it would if independent and separate, ruled by anything better than a totalitarian autocrat.

Case II: Cross Subsidy from the Colony to Home, Allocative Budget in Surplus; Positive Direct Income Transfers to Home: $t^H = 0$; $\Sigma G^k < \Sigma R^k$.

In this second case, taxation of the colony is so effective that home producers are not taxed at all by their consensual representative government. The revenue income from the colony is greater than the total expenditures on productivity enhancing and market augmenting public goods in both home and colony sectors, leaving a pure income transfer for the home sector. In this case, with $\lambda = 0$, and $t^H = 0$ necessary conditions become:

$$t^C: \quad [1 + \lambda][r^C + t^C r_t^C] = 0 \Rightarrow [r^C + t^C r_t^C] = 0: \{\text{Autocratic taxation}\} \tag{28}$$

$$G^H: \quad Y_G{}^H - 1 = 0: \{\text{Perfect Utopian provision of } G^H\} \tag{29}$$

$$G^C: \quad t^C r^C Y_G{}^C - 1 + \lambda[t^C r^C Y_G{}^C - 1] = 0 \Rightarrow t^C r^C Y_G{}^C = 1: \{\text{Autocratic provision of } G^C\} \tag{30}$$

The interpretation of these is straightforward. Treatment of the colony is the same as in case I, but in this case market augmenting and other public goods are so productive in the colony and deadweight loses from taxation are so small that autocratic taxation of the colony yields a grand surplus --- so great that no home taxation is required and therefore no tax driven deadweight loss arises there at all. Consequently the surplus taken from the colony is allocated to market augmentation or other public good provisions until the marginal contribution of G^H, that is $Y_G{}^H$ falls to the level of its marginal cost which equals one. Thus equation (29) shows $Y_G{}^H = 1$, the same outcome as pictured in Figure 1. By avoiding all taxation, deriving its entire revenue from its colony, Home avoids all deadweight losses, which, therefore, have no effect on its decision of how much market augmentation to provide. Ironically, sufficiently productive foreign taxation supports truly perfect *utopian* market augmentation at home, that is perfect support of markets from resources extracted at zero efficiency loss (home DWL).

With identical Y(G) and r(t) functions colonization would be a bad deal for the colony, but conceivably if G in the home country was very highly productive and t very destructive while the opposite obtained in the colony, then colonization could be potentially Pareto superior (materially) to independent Lindahl governance! Unlikely as this conclusion may seem, it does suggest simulation analysis may be a rich source of insight into the relative effects of punishing efficiency loss and productive market augmentation in countries at various stages in development.

III: Cross-Sectoral Market Augmentation

The foregoing model treats the home country or ruling sector, and the colony, or exploited sector as really two separate economies. No private good trade gains nor common collective good investment benefits are modeled explicitly between them. This a fair representation of one country with an exploited and a governing class --- or at least a first step toward having differential taxation between the rulers and the ruled in the Y-r-t-G-F-S set up. A more complete model would allow for the F-majority to be drawn from both sectors, some from the home's ethnic citizenry and some from the foreign ethnic group. This would allow derivation of the tax rules and market augmentation provision to change smoothly with the proportions F_H and F_C, where the subscripts indicate F-values of home and colony populations represented by the elite.

A less complicated representation of a common interest between the ruling classes in H and the colonized groups in C is to assume some common public goods or market augmentation along a common dimension among/between them. To capture this we re-write the production function of each as $Y^k(G^k, G^N)$, where k = H, C. This allows G^k to differ between sectors or regions, but requires G^N to be the same non excluded, non-rival public good which both share (this might be a common set of contract laws, police enforcement, financial system/regulation, or even a common defense to the extent such measures count to secure markets and allow transactions which otherwise would not occur etc.)

With this change the welfare objective of the Lindahl-Consensual home government becomes

$$\underset{t^H, t^C, G^H, G^C, G^N}{Max} \quad W = r(t^H)Y(G^H, G^N) + t^C r(t^C)Y(G^C, G^N) - G^C - G^H - G^N \tag{31}$$

subject to:

$$\lambda[t^H r(t^H)Y(G^H, G^N) + t^C r(t^C)Y(G^C, G^N) \geq G^H + G^C + G^N] \tag{32}$$

The sum of terms on the left within the constraint are tax revenues, and on the right expenditures on G. This extension of the model to include economy wide public factor inputs has no effect on the classification made earlier into two classes of solutions (a) with $\lambda > 0$, $t^H > 0$, $\Sigma G^k = \Sigma R^k$, and (b) with $\lambda = 0$, $t^H = 0$, $\Sigma G^k < \Sigma R^k$. So with the addition of an economy wide public good we must deal with two cases once again. The details with respect to the Home government's choice of t^k and of G^k, for k = (H, C) are not qualitatively changed by the introduction of the common production factor so they are omitted. The interesting difference concerns provision of G^N the joint-public factor input. Home country's best choice of G^N is neatly summarized.

For $t^H > 0$ $$\frac{Y^H{}_N}{Y^H{}_G} + \frac{Y^C{}_N}{Y^C{}_G} = 1 \tag{33}$$

For $t^H = 0$ $$Y^H{}_N + \frac{Y^C{}_N}{Y^C{}_G} = 1 \tag{34}$$

Thus, the efficient home country insures that the total value of G^N measured in each domain relative to the alternative investment of G^H or G^C and then summed across domains equals its marginal cost. Really (34) is a special case of (33) since when $t^H = 0, Y^H{}_G = 1$. First of all, either of these conditions is to be compared with the truly optimal provision of G^N. Both (34) and (35) show under provision of G^N since utopian optimality requires $Y^H{}_G = 1$, $Y^C{}_G = 1$, and $Y^H{}_N + Y^C{}_N = 1$. Comparison between these conditions shows that a Lindahl Home government has an incentive to do a better (though still not an ideal) job of providing for the joint common production economy when it is so successful in extracting a monetary surplus from its colony that it need not tax itself at all. This follows from $Y^H{}_G > 1$ when $t^H > 0$, but when $t^H = 0, Y^H{}_G = 1$.

V
Corruption: Failure of Governance by Competition

We now come to the third of the Failures in Economic Governance which erode the provision for markets and their efficient operation. This is "Failure by Corruption": in this paper viewed strictly and solely as it pertains to the public sector. At this stage I take a naive definition of "corruption" as illicit or unsanctioned private intervention into the privileged/reserved activities of the State for private gain. I say "naive" because I will not delve into questions of when such intervention is really just another example of redistribution from the powerless to the powerful. Instead I will focus on one sweeping distinction in the theory and practice of corruption, namely the divide between taxation and expenditure activities of the government. Accordingly we will delve into the comparative economics of corruption in the tax sector vs. the expenditure sector. As representative issues in such failure in economic governance, we ask:

- Is corruption in the tax system or in the provision of public goods more damaging to an economy?
- How do the incentives which lead to corruption determine the final equilibrium of the Political Economy, including the incidence and the redistributive effects of corruption's benefits and costs?
- Do the costs of corruption in taxation vs. expenditure vary systematically with the form of governance?

To my knowledge, these questions have not been posed in the literature despite their importance, nor has this approach to the analysis of corruption been forwarded elsewhere. One reason for this may be a latent presumption that it will not matter whether unwelcome, corrupt intrusion is imposed on the demand or supply side of the market --- such being the received wisdom of partial equilibrium tax analysis in public finance. Whether this is the explanation or not, we will see that in the analysis of corruption --- to be defined momentarily as an additional tax paid to a tax collector/entrepreneur or and additional bribe/cost for G paid to the government's expenditure agent --- it matters a great deal which side of the market this corruption tariff is imposed upon, and matters a great deal what is the form of governance.

Mancur Olson was among the first to recognize the efficiency benefits to a society of granting exclusive power to tax to one single taxation authority. One wants the entity with authority to tax to act as a monopoly --- in his charming terminology a ***stationary*** bandit rather than a ***roving*** bandit --- for this reduces the opportunities

for excessive tax-theft. The monopoly tax-authority will internalize in its benefit cost calculus the losses which its taxation impose on the entire society because the entire society creates the tax base on which the monopolist subsists. Similarly, monopoly power on the expenditure side concentrates the incentives to invest in the provision of market augmenting public goods for the economy and gives the Government monopoly the maximum incentive to expand through rational investment the economic base on which it and its tax collections depend. Accordingly, the failure in governance represented by corruption really results from a break down in these monopoly powers. Because loss of monopoly power causes corruption, we have called this failure a "failure by competition."

The extensions of McGuire-Olson sketched out above, in fact apply directly to this issue of comparing corruption on the tax and benefit sides, allow a direct comparison of the effects of these two types of corruption under alternative forms of governance, and will uncover the incentives corruption generates to tax too much or too little, and to under or over provide market sustaining social overhead capital. In particular, a redistributive government perceives a differential between the marginal cost of tax resources which include (DWL) and the marginal cost of a unit of public good (which is simply its unadulterated resource cost of 1) while a consensual, non-distributive government does not perceive any such difference. Because of this crucial distinction the effects of tax corruption and expenditure corruption differ in principle between the two types of politico-economic regimes. To be concrete we first must decide how to characterize "corruption." Here I assume the very simplest form --- a constant percentage mark up in taxes, or in costs of public good provision. So for any net tax rate "t" I will assume that corruption in the tax system adds a constant % mark-up of B. Thus for the government to collect t%, the tax to the citizens becomes t(1+B)% with the purveyors of corruption obtaining trB% of national income. In the same fashion I assume that corruption in the provision of public goods adds a constant mark-up to the unit price of G, so that in order to obtain one unit of G at a resource cost of 1, the government must pay (1+A) units of Y, with $A going to a corrupt agent. Next, in order to pursue the comparisons among different regimes even handedly I will assume that the corruption mark-up is the same whether applied to taxation or expenditure. That is, I will assume $\beta = (1+B) = (1+A) = \alpha$. Any other assumption would prejudice the analysis from the start.

Now we introduce corruption into the decision framework of the Lindahl Consensus, and the Redistributive Elite, including the special case of an Autocrat. Objective functions and constraints now change as:

For the Lindahl Consensus:

$$W = \underset{t}{Max}[1 - \beta t] \cdot r[\beta t] \cdot Y[G(t)] \;\; s.t. \; tr[\beta t] \cdot Y(G) - \alpha G = 0 \tag{35}$$

For the Redistributive Elite:

$$\underset{t,G}{Max}[1 - \beta t] \cdot r[\beta t] \cdot FY(G) + [tr[\beta t] \cdot Y(G) - \alpha G]; \;\; s.t. \; \alpha G \leq tr[\beta t] \cdot Y(G) \tag{36}$$

i.e.

$$\text{Max} \;\; S(t, B, F) \cdot r[\beta t] \cdot Y(G) - \alpha G; \;\; s.t \;\; \alpha G \leq tr[\beta t] \cdot Y(G) \tag{37}$$

This arrangement now allows us to compare the effects of positive A, B on the Government's decision to tax and to supply market augmenting public goods. It will allow us to study whether one avenue of corruption or the other is more profitable under different forms of government, for example whether tax corruption is more or less profitable than expenditure corruption under an autocracy vs. a Utopian ideal such as a Lindahl Consensus. Moreover, this analytic tool will help us understand better the channels by which corruption spreads throughout the political economy of a country passing infection from one sector to another. Lastly one might hope to learn where corruption might be most easily isolated or controlled.

Effects of Corruption on the Behavior of a Ruling Majority

Following the same procedure for the S-majority as reported in the derivation of equations (9)-(15) one finds that corruption does not alter the decision sequence for the ruling elite: the rulers first choose a value of t to maximize their share and then chooses a value of G such that the marginal private benefit of the last increment of G equals the marginal private cost. In other words, neither tax nor expenditure corruption changes the independence of the determination of how much to tax from how much public good to provide. Assuming positive redistribution to the elite gives R(B, t) in place of R(t) of equation (12) and t(F, B) in place of equation (13) as follows:

$$F = \frac{r + \beta tr}{\beta r - [1 - \beta t]\beta r'} = R(t, B) \tag{38}$$

$$t^* = -\frac{r}{\beta r'} - \frac{F}{1 - \beta F} \tag{39}$$

When B = 0 or β = 1 these reduce to (12) and (13) respectively. Equation. (39) suggests that tax corruption reduces the tax rate of the ruling majority for given F and of increasing the total tax burden on the citizenry. The most notable feature of the redistributing elite's optimum choice is that the tax rate is effected only by B plus the r(t) function. That is, while tax corruption influences the chosen tax rate, expenditure corruption does not --- basically a corollary of the independence of tax and expenditure decisions.

Expenditure corruption - - - represented by the parameter A or a - - - of course influences the amount of public good provided. The expression for optimum choice of G, corresponding to equations (14)-(15) is derived as:

$$rY' = \frac{\alpha}{S} = \alpha \frac{\beta[r - [1 - \beta t]r']}{r[1 + \beta tB]} = -\frac{\alpha r'\beta}{r[1 - F\beta]} \tag{40}$$

It is clear from (40) that a redistributing majority's marginal private benefit rY' is degraded by tax corruption since r = r(t,B). Moreover the ruling elite's "share", S, is also eroded by tax corruption; not only is there an indirect effect on S because r is reduced by B, but there is a direct effect since the agents of corruption exact their own share thereby directly reducing the share of the ruling interest --- a double whammy which the optimal choice of t* adjusts to only partially. Equation (40) shows these dual impacts of B on the choice of G by the terms in the numerator and denominator, showing also how the entire society suffers from corruption on the expenditure side: by raising the price of public goods the agents of expenditure-corruption further reduce the incentive of the ruling elite to provide them. We will give a numerical example of these effects presently for the special case of autocracy, when F = 0 and S = t in the above equations. (To determine more precise insights the system (38) and (40) should be differentiated totally with respect to A and B.)

Figure 7a gives a picture of these multiple effects. Notice that the MSC(t)/r both shifts up because of B and rotates clockwise. At the same time we can show the independent effect of expenditure-corruption by showing the equilibrium choice of G using $Y'/(\alpha) = 1/rS$ as in equation (40) above. Under this convention, the marginal

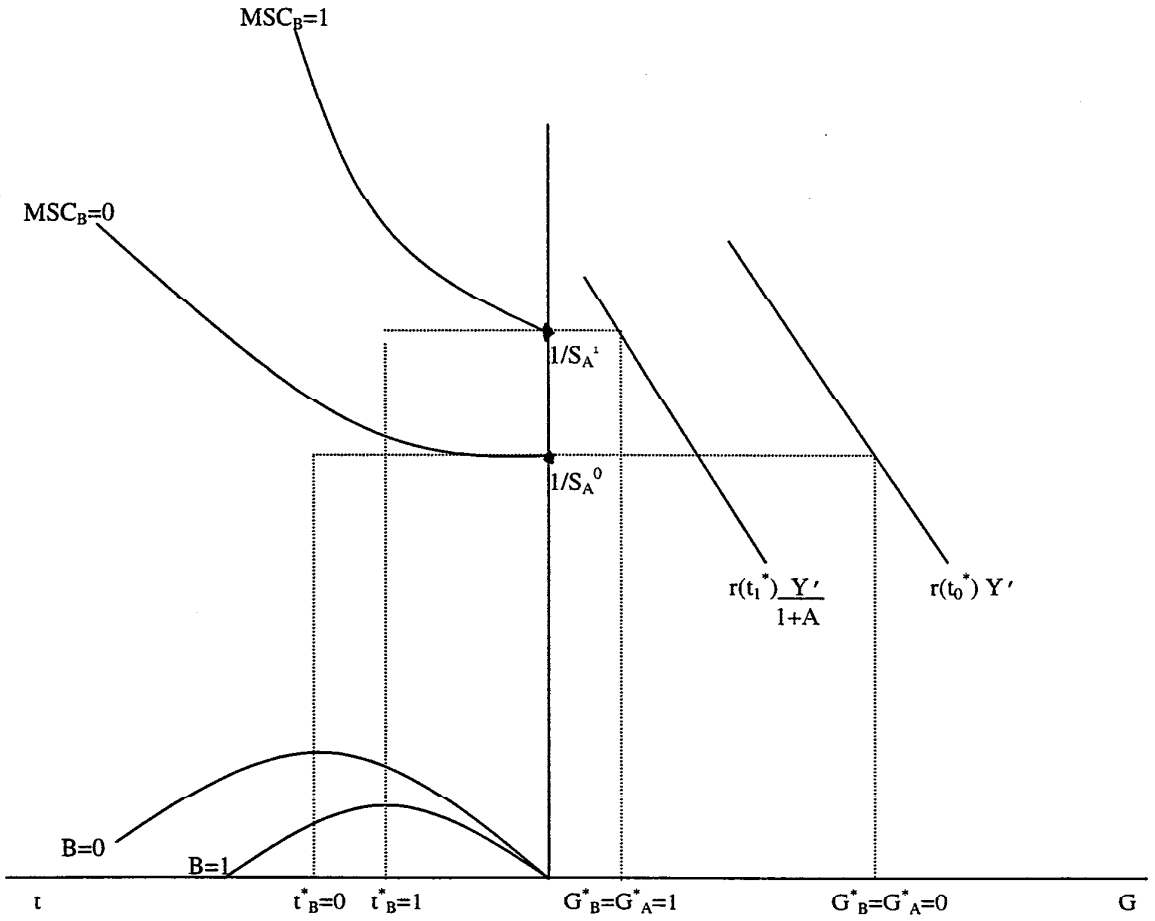


Figure 7a.
Effects of Expenditure Corruption (A = 1) and Tax Corruption (B = 1) In an Autocracy

product curve of G rotates downward to Y'/α as shown, and the overall effect of corruption on the choice of social capital or market augmentation effort is shown to result from the two simultaneous shifts.

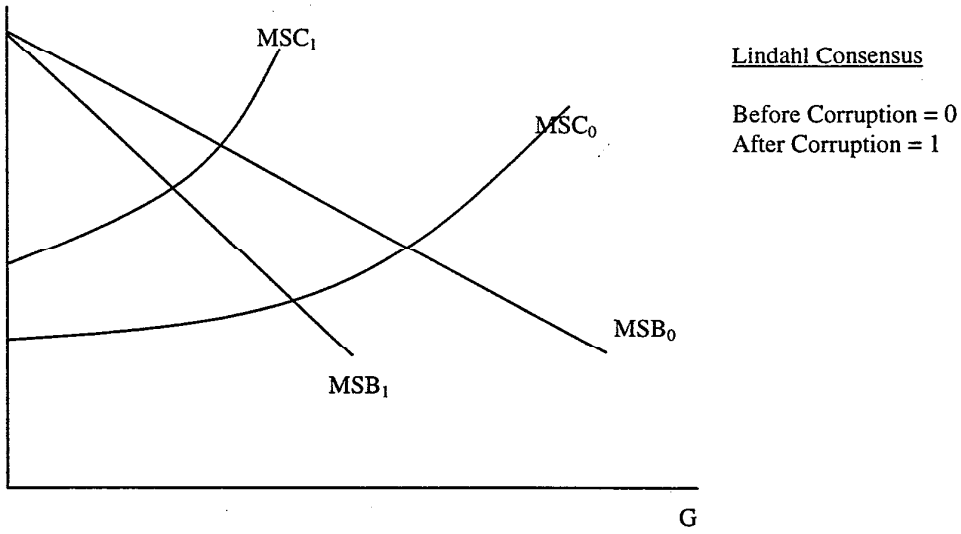


Figure 7b.
Effects of Expenditure and Tax Corruption Under a Consensual Government

Effects of Corruption on the Behavior of a Lindahl Consensus

To maximize its welfare, the Lindahl consensus considers alternative balanced budget provisions of G. We can no longer separate the decisions to tax from those to provide public goods, as the balanced budget constraint now becomes: $\alpha G = t \cdot r(\beta t) \cdot Y(G)$. The outcome which simultaneously combines best choice of t and of G reduces to (41) where r(βt) etc. are to be understood as r a function of t(1+B). Equations (41) or (42) are to be compared with equation (14) as the case of zero corruption:

$$Y' = \alpha \frac{r(\beta t) - [\beta(1-t)]r'(\beta t)}{[r(\beta t)]^2} \tag{41}$$

or

$$\frac{Y'}{\alpha} = \frac{r(\beta t) - [\beta(1-t)r'(\beta t)]}{[r(\beta t)]^2} \tag{42}$$

In the case of a redistributive democracy equations (39) and (40) indicated that the effects of tax versus expenditure corruption on the economy and on the political economic choice of public good/market augmentation provision can be separated out, in the sense explained above. But for a consensual democracy which taxes only to provide public goods and not to redistribute this is no longer true. Tax corruption directly influences provision of public goods like market augmentation, and expenditure corruption directly effects the requirements for taxation to support market augmentation. A complete evaluation of the interactions between the two types of corruption will be derived from total differentiation of the system of equations consisting of the first order condition (41), together with the resources constraint $t \cdot r[\beta t] \cdot Y(G) - \alpha G = 0$ Some rough generalization however can be extracted from an examination of equation (42). First, if A increases from an initial value of A = 0, or $\alpha = 1$, and B = 0, then total differentiation of the equilibrium system will indicate a new higher value of Y' meaning lowered G; and this is combined with a partially offsetting increase in t to maintain tax revenues to finance more expensive (including the corruption premium) public goods in an economy with lesser cooperating G-factor input. Specific outcomes will depend on details of Y(G), Y', Y" etc as well as on r, r', r". Similarly, the systematic effects of an introduction of tax corruption in a consensual society are derived assuming A = 0 and considering an introduction of B > 0. First order effects of this change indicate $\partial Y'/\partial B > 0$, provided $r'' < 0$. This implies that tax corruption will indeed reduce the Lindahl society's market augmenting investment in itself, and will therefore dampen overall production.

7b gives a general idea of these outcomes for the Lindahl Consensus democracy to be compared with redistributive regimes. One sees that expenditure corruption has a progressively declining effect as the optimal value of G increases (which would be the case, for example, if G in Y(G) becomes more productive). This follows from the fact that the difference between Y'(G) and $Y'(G)/\alpha$ grows progressively smaller as G increases. At the same time the numerator of (41-42) shows that the tax corruption effect on the choice of t also declines as t increases, and disappears altogether when t = 1. Both of these factors therefore indicate a particular vulnerability of small and low technology economies to corruption. With a powerful incentive to invest in its economy (suppose $Y = 100G^{0.8}$) a government is less effected proportionally than is a less advanced economy say with $Y = 10G^{0.4}$.

We can use a table to summarize in a general way what this analysis indicates about how the expected incentive effects of corruption vary with the form of governance.

Table I
Expected Incentive Effects of Corruption
Depend on the form of the Government

Venue for Corruption	Decision Structure of Autocracy: Max tr(t, B) Budget Surplus = trY - (1+A)G G: Y' = (1+A)/t*R(T*, B) **Choice of G & t separated**	Structure of Lindahl Consensus: Max: r(G)Y(G) - (1+A)G Balanced Budget: tr(t, B)Y(G) = (1+A)G G = f(t, B, A) **Single choice of G ⇔ t**
Govt Supply Cost Rip-offs A > 0 price of G = (1+A)	No direct effect on tax revenue t and S(t) not changed directly, but only by the autocrat's choice Opt G declines and ∴ Y(G) declines and ∴ tax revenues s and autocrat's tribute decline. Citizens' after tax income declines because of lower G, and Y(G) even though t is not changed directly.	The choice of public goods supply and of taxes to collect are made together, since the only reason for taxation is to supply public goods. Therefore, one should expect the effects of tax corruption and of expenditure corruption to be more or less qualitatively similar. Expenditure corruption which raises the price of G creates incentives to lower taxes since the DWL of taxes brings reduced productive benefit. But lower taxes further reduce tax revenues leading to compounded incentives to further reduce public goods supply. Tax corruption raises the marginal DWL cost of resources. Therefore the required social payoff to marginal G must increase and with this the incentive to invest in G must decline.
Tax-Inflation Rake offs B > 0 tax rate = t(1+B)	Govt Tax Rev declines for two reasons: a. Increases DWL in economy. b. Leakage from Treasury reduces opt t and S(t) = tr Lower Share reduces opt G and ∴ Y(G) and ∴ optimum collections trY(G) Therefore Citizens lose both because of less G (due to lower S) and because of reduction in their share to [1-t(1+B)]	

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Summary Comparisons

1. Citizen's Consumption

B / A	0	1
	Lindahl Autocracy	
0	432 128	212 64
1	216 64	106 32

2. Tax-Collections/Social-Overhead Provision

B / A	0	1
	Lindahl Autocracy	
0	144/144 128/64	44/44 32/16
1	72/36 64/16	22/11 16/4

3. Graft

B / A	0	1
	Lindahl Autocracy	
0	0 0	44 32
1	36 16	33 20

These calculations indicate several important trends.

Corruption overall is slightly more devastating to citizens in a Lindahl consensus society than in an autocracy (from table 1: 106/432 < 32/128). Citizens in a Lindahl consensus are slightly more vulnerable to tax corruption than to expenditure corruption compared to an autocracy (216 > 212).

Tax and expenditure corruption interact/compound with devastating effects on market augmentation under both regimes although even worse under an autocracy than a consensual society (from table 2: 4/64 < 11/144).

Tax graft is more lucrative than expenditure graft under both regimes but the superiority of corruption in the collection of taxes under an autocracy is proportionally much greater than it is under a consensual government (from table 3: 44 >36 and 32> 16).

Tax plus expenditure graft as a proportion of citizens consumption or of national income, is much much greater in an autocracy than in a Lindahl Democracy. (From tables 1 and 3: 20/32 >> 33/106). The inevitable conclusion is that if one must have a graft-ridden government it is much better to be democratic than autocratic. Or put otherwise, the monopoly graft of a single autocrat is much worse for everyone (the corrupt independent agents of graft as well as the citizens).

Appendix

Majorities Which Provide Ideal Market Augmentation

A striking implication of this model is that ruling elites with sufficiently broad ownership stakes in their economies will undertake no redistribution whatever, and will treat those with no power and allocate resources the same would an idealized consensus democracy. To see why, consider the two opposing incentives in the M-O theory. First, the greater a ruling interest's market fraction, F, the larger its share of the deadweight loss of taxation and the **lower** the tax rate it desires. This follows from (11). Second, the greater the value of S, the larger is the elite's share of the benefits from market augmentation and the **more** it wants to provide, which follows from (12). The public good is needed to produce output and, as F -- and therefore S -- goes up, those in political power obtain a larger share of the benefits of the benefits of G, which makes them want to provide more, thereby requiring that more taxes be allocated to provision of G. Equation (12) shows that, as F and thus S increases, the solution value of Y' declines and therefore G_R^* increases. Thus, as a ruling elite's ownership stake in the economy grows, it wants to tax less and, at the same time, spend more of the taxes it does raise on the provision of G. Once F reaches a high enough value, t_R^* will be so low and G so great that all tax revenue is needed to pay for public goods and there will be no redistribution[15]. Now consider a society in which the r(t) and Y(G) functions remain unchanged, and where market sustaining social order is essential for production of any output at all [Y(0) = 0]. As F increases, and with it S, a point $\hat{F}$ will be reached where the ruling elite allocates all taxes to public good provision. At this point government represents such a high fraction of the economy that it ceases redistributing and treats the minority as

[15]The existence of ruling interests that leave out part of society, yet act in the interest of all, is not only a possibility, but also (with incentive-distorting taxation) a necessity. For F = 0 the autocrat obtains a positive surplus for himself while he provides G_A^* of the public good. By equation (15) there is also a value of $F = F^0 < 1$ that entails that $t_R^* = 0$. At this tax rate, there is no revenue for G. It follows that some value of F ($0 < F < F^0$) will entail a positive tax rate just sufficient to pay for the optimal provision of G. We designate the "cross-over" values at this point as $\hat{F}, \hat{t}^*, \hat{G}^*$. A value of $\hat{F} \leq F^0$ must exist where the rulers are best served by a tax rate just sufficient to finance optimal provision of public goods: at $\hat{F}$, by definition $\hat{t}^*\hat{r}^*Y(\hat{G}^*) = \hat{G}^*$. That is ruling interests must abstain from redistribution before $F = F^0$ and therefore *before F = 1*, which proves that, when a majority or other ruling interest is sufficiently encompassing, it will not redistribute any income, and will treat those subject to its power as well as it treats itself.

well as it treats itself. If the government reflects this fraction, $\hat{F}$, or any greater fraction, it will **not** redistribute to itself. It will, in fact, act in exactly the same way the consensual democracy does.

We derive this conclusion by returning to the Lagrange function, (11) but now assume that trY = G. Then $\lambda > 0$ and the first order conditions with respect to t yield:

$$\frac{F}{1+\lambda} = \frac{r+t'r}{r-(1-t)r'} \equiv R(t) \tag{A1}$$

or

$$F = (1+\lambda)\,R(t) \tag{A2}$$

and with respect to G, we obtain

$$\frac{F}{1+\lambda} = \frac{1-trY'}{(1-t)rY'} \tag{A3}$$

Equation (A1) or (A2) gives the condition for optimal distribution when the majority just supplies the public good out of tax collections with nothing left over for redistribution and $l > 0$. Under these conditions (evaluated at zero redistribution) the majority's marginal costs of redistribution exceed the marginal benefits which it would gain. Condition (A1) says that, if it were possible to reduce taxes toward equality of their marginal costs and benefits, the ruling interest would do so. Lower taxes, however, would cut into the revenue needed to finance the desired level of the public good. Analogously, equation (A3) indicates that at the constrained optimum of G, the marginal benefits of G exceed marginal costs. Equations (A1) and (A3) also indicate that every ruling majority with an F so high that it rejects redistribution behaves just like a majority with $F = \hat{F}$. All ruling interests that are forced by the constraint trY = G not to redistribute behave as if their $F = \hat{F}$ and as if they had chosen trY = G. That is, for all $F > \hat{F}$, $F/[1+\lambda] = \hat{F}$.

One implication of this equivalence is that every non-redistributive ruling interest, whatever its F, will make the same decisions about public good provision it would have made had its F been $\hat{F}$ and all will have the same tax rate $\hat{t}^*$. It also means that such a "super-encompassing" majority will provide the same level of G and have the same tax rate as a consensual democracy. Thus when $F \geq \hat{F}$, the absence of redistribution implies that both the majority and the minority each pay their proportional share of the tax burden. The majority receives F percent of the benefits of the public good and pays F percent of the tax. It therefore chooses exactly the same level

of public good provision as the consensual democracy. Thus the society ruled by a super-encompassing majority not only abstains from redistributive taxation, but it also chooses an ideal[16] level of public good provision that reflects the minority's interests as its own. This can be seen by comparing the net income of the Redistributive Majority at $\hat{F}$ where it redistributes nothing, with its welfare if it had no separate power, and were just 100 $\hat{F}$ % of a consensus democracy.

$$\text{Redistributive Majority's Net Income} = SrY - G \tag{A4}$$

$$\text{Majority's Fraction of Society's Net Income} = F[rY - G] \tag{A5}$$

When all taxes are spent on G, then trY = G, and the two incomes of the $\hat{F}$ - Majority are the same, and all failure of governance by redistribution vanishes.

[16] Public good provision is "ideal" but still subject to deadweight losses from taxation.

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