Suppose $z(g)$ represents the cost of governance where $z'(g) > 0$ and $z''(g) > 0$. Formally, the government's problem is the choice of {t, g} subject to the budget constraint $mtY(g, t) = z(g) + S$ such that the per capita income of the poor $X = y(g) + \frac{S}{m+n}$ is maximized. Substituting $S = mtY(g, t) - z(g)$ from the budget constraint in to the objective function, the problem turns to one of unconstrained optimization where the government chooses $\{t, g\}$ to maximize $X = y(g) + \frac{[mtY(g,t) - z(g)]}{m+n}$. Suppose $\{t^* > 0, g^* > 0\}$ represent the solution to the problem. Then, at the optimum, the first-order conditions for maximization are:

$$Y(g^*, t^*) = -t^* \frac{\delta y}{\delta t} \qquad (2.1)$$

$$mt^* \frac{\delta Y}{\delta g} + (m+n)y'(g^*) = z'(g^*) \qquad (2.2)$$

For the second-order condition to be satisfied at the optimum it must be true that:

$$\left[t\frac{\delta^2 y}{\delta t^2} + 2\frac{\delta Y}{\delta t}\right] < 0 \text{ and}$$

$$\Delta = \left[\left(t\frac{\delta^2 y}{\delta t^2} + 2\frac{\delta Y}{\delta t}\right)\left(mt\frac{\delta^2 y}{\delta g^2} - z''(g) + (m+n)y''(g)\right) - m\left(\frac{\delta Y}{\delta g}\right)^2\right] > 0.$$

In deriving the value of Δ we have used the assumption that $\frac{\delta^2 Y}{\delta t \delta g} = \frac{\delta^2 Y}{\delta g \delta t} = 0$. The assumptions made previously about the slopes and curvatures of the $Y(g, t)$, $y(g)$ and $z(g)$ functions also ensure that $\left[t\frac{\delta^2 y}{\delta t^2} + 2\frac{\delta Y}{\delta t}\right] < 0$. We assume $\Delta > 0$ for convenience. So, the second-order condition is satisfied at the optimum. Given m if n rises, poverty increases at the equilibrium distribution of income as the 'head-count ratio' of the poor increases in society. If we think about the society without any redistribution schemes, then income inequality also rises as n rises. The first proposition of the model states the effect of the rise in poverty in a democratic society on its equilibrium choice of $\{t^*, g^*\}$.

PROPOSITION 2.1. *A government under democracy but with a high level of poverty chooses lower values of t^* and g^**

Proof. From equations (2.1) and (2.2) it follows that:

$$\frac{dt}{dn} = y'(g)\frac{\left[\frac{\delta Y}{\delta g} + t\frac{\delta^2 Y}{\delta g \delta t}\right]}{\Delta} \quad (2.3)$$

$$\frac{dg}{dn} = -y'(g)\frac{\left[2\frac{\delta Y}{\delta t} + t\frac{\delta^2 Y}{\delta t^2}\right]}{\Delta} \quad (2.4)$$

Since $\Delta > 0$, from the second-order condition the sign $\frac{dt}{dn}$ is determined by the sign of $y'(g)\left[\frac{\delta Y}{\delta g} + t\frac{\delta^2 Y}{\delta g \delta t}\right]$, whereas the sign $\frac{dg}{dn}$ is determined by that of $-y'(g)\left[2\frac{\delta Y}{\delta t} + t\frac{\delta^2 Y}{\delta t^2}\right]$. From equations (2.3) and (2.4), and using the assumptions of the model $\left[y'(g) < 0, \frac{\delta Y}{\delta g} > 0, \frac{\delta^2 Y}{\delta t \delta g} = 0, \frac{\delta Y}{\delta t} < 0, \text{ and } \frac{\delta^2 Y}{\delta t^2} < 0\right]$ it follows that, $\frac{dt}{dn}$ and $\frac{dg}{dn}$ are both negative. Hence, the statement of the proposition holds.

Notice, that the rather 'unconventional' redistributive instrument, i.e., the quality of governance, plays a crucial role in the proof for Proposition 2.1. The choice of a lower quality of governance creates an income-opportunity for the poor, and this is implied by $y'(g) < 0$. Because of the fact that $y'(g) < 0$, the government with its objective of maximizing per capita income of the poor strikes a balance in its choice between the two instruments *t* and *g*. It chooses lower values for both as poverty and income inequality increase in society. In the absence of the instrument *g*, in a similar situation one would expect the government with such an objective to choose a higher value of *t*, as the conventional political economy models would predict. Interestingly, inclusion of the additional instrument for redistribution through the choice of the quality of governance changes the result remarkably. This largely explains the empirical findings that stood as exceptions to the predictions of the conventional political economy models, where a higher level of poverty and inequality goes hand in hand with a higher tax rate.

So far, we have not said much about inequality. A simple measure will be the relative average income of the rich vis-à-vis the poor. It can be shown that if n increases, income inequality also goes up, provided the rich have a higher average income initially. However, as g and t respond to a rise in n, there are various cross-effects. A decline in total subsidy and a drop in t strengthen the rising inequality effect, but a rise in y through a fall in g weakens the same. One can show that if the response of y to g is really sharp, the rising inequality effect as an initial condition will be offset to some extent by alterations in g. Thus, societies with very high n can reduce the degree of inequality by altering g. In fact, a very high n to start with means that the effect of the subsidy component will be negligible, that is, alterations in the total value of tax revenue to be used as per capita subsidy will have little impact, and then it is likely that the g effect will dominate. A purpose of this section is, therefore, to show how the income level of a typical poor person is positively affected by a weak governance structure. This is the reason why we abstracted from considering the inequality impact. After all, the poor voter should care much more about individual income than the social measure of inequality.

Of course, the nature of informality is not the same in every society. In some societies a change in the governance level has a significant impact on the income of the informal sector, while in some others it does not have much of an impact. It can be argued that societies where change in the governance level has a negligible impact on the income of the informal sector, choose a higher level of governance and tax rate. Thus:

PROPOSITION 2.2. *Societies where change in the governance level has a negligible impact on incomes in the informal sector choose higher tax rates and higher levels of governance*

Proof. If the change in the governance level has negligible influence on the income of the informal sector, in terms of our model, it implies $y'(g) \approx 0$. We compare the equilibrium choice of t^* and g^* of the two societies with $y'(g) < 0$ and $y'(g) \approx 0$. The equilibrium values of t^* and g^* satisfy equations (2.1) and (2.2) in the situation where $y'(g) < 0$. Given $t = t^*$ if $y'(g) \rightarrow 0$, equation (2.2) changes to:

$$A = mt^* \frac{\delta Y}{\delta g} - z'(g^*) > 0 \qquad (2.5)$$

The previously chosen value of $g = g^*$ cannot be the optimum in such a situation. Suppose, $g = \bar{g}$ defines the new optimum. The value of $\bar{g}$ must be chosen in such a way that $A=0$. Once again, it follows from the assumptions of the model and from equation (2.1) that $\frac{\delta A}{\delta g} < 0$. Therefore, it must be the case that $\bar{g} > g^*$.

As the value of g increases to g^* from equation (2.1) it turns out:

$$B = [Y(\bar{g}, t^*) + t^* \frac{\delta Y}{\delta t}] > 0 \tag{2.6}$$

The previously chosen value of $t = t^*$ cannot be the optimum in such a situation. Suppose, $t = \bar{t}$ defines the new optimum. The value of $\bar{t}$ must be chosen in such a way that $B = 0$. Observe that the second-order condition for optimization implies $\frac{\delta B}{\delta t} < 0$. Therefore, it must be the case that $\bar{t} > t^*$. This has a feedback effect on equation (2.5), which further boosts the value of g.

This justifies Proposition 2.2, which in other words shows that in its choice of the tax rate and governance level, if the government does not take into account the effect of the former on the incomes earned by workers in the informal sector, then it chooses a higher level of governance and a high tax rate.

However, there are situations when the government is constrained in its choice of tax rate. An example would be the behaviour of the governments under the threat of capital flight. To retain capital within their own jurisdictions, governments often compete with each other by lowering their tax rates. The next comparative static result of the model, therefore, treats the tax rate as exogenous to the government's choice of g and tries to see the effect of lowering the tax rate on its choice.

PROPOSITION 2.3. *If the government is constrained in its choice of the tax rate, a stricter constraint implies a lower choice of the level of governance*

Proof. Suppose the government is constrained in its choice of the tax rate t such that in its maximization of $X = y(g) + \frac{[mtY(g,t) - z(g)]}{m+n}$ with respect to $\{\tilde{t} > 0, \tilde{g} > 0\}$ it is allowed to choose among the values of t satisfying the constraint $t \le \bar{t}$. Then the Lagrange expression for optimization can be written as:

$$Z = y(g) + \frac{[mtY(g,t) - z(g)]}{m+n} + \lambda(\bar{t} - t) \tag{2.7}$$

where, $\lambda \ge 0$ stands for the Lagrange multiplier. The Kuhn-Tucker conditions for maximization imply at $\{\tilde{t} > 0, \tilde{g} > 0, \tilde{\lambda} \ge 0\}$ that the following equations must be satisfied:

$$\frac{m}{m+n}\left[Y(\tilde{g},\tilde{t}) + \tilde{t}\frac{\delta Y}{\delta t}\right] = \tilde{\lambda} \tag{2.8}$$

and, $$m\tilde{t}\frac{\delta Y}{\delta g}+(m+n)y'(\tilde{g})=z'(\tilde{g}) \tag{2.9}$$

If the constraint $t \leq \hat{t}$ binds then $\{\tilde{\lambda}>0\}$, which implies $\{\tilde{t}=\hat{t}\}$. Otherwise, $\{\tilde{\lambda}=0\}$, which implies, $\{\tilde{t}<\hat{t}\}$. In the case where $\{\tilde{t}<\hat{t}\}$, the choice of $\{\tilde{t}>0, \tilde{g}>0\}$ is guided by equations (2.1) and (2.2), already discussed earlier. Suppose, the constraint binds and it is always $\{\tilde{t}=\hat{t}\}$. Then, we have the case of Proposition 2.3. Now equation (2.8) loses its relevance. The choice of $\tilde{g}$ follows equation (2.9) in the way:

$$m\hat{t}\frac{\delta Y}{\delta g}+(m+n)y'(\tilde{g})=z'(\tilde{g}) \tag{2.10}$$

from (2.10) it follows, $$\frac{d\tilde{g}}{dt}=-\frac{m\frac{\delta Y}{\delta g}-mt\frac{\delta^2 Y}{\delta g\delta t}}{mt\frac{\delta^2 Y}{\delta g^2}-z''+(m+n)y''} \tag{2.11}$$

Since, $[\frac{\delta Y}{\delta g}>0, \frac{\delta^2 Y}{\delta g\delta t}=0$ and $\frac{\delta^2 Y}{\delta g^2}<0, z''>0$ and $y''<0]$, equation (2.11) implies $\frac{\delta\tilde{g}}{\delta\hat{t}}>0$. This is what we claim in Proposition 2.3.

The intuition behind Proposition 2.3 is also straightforward. If the government is forced to lower the tax rate, it is left with lower tax revenue for redistribution, which hurts its chance of winning the election. Therefore, it lowers the governance level, which indirectly favours redistribution towards the poor.

INFORMALITY AND CORRUPTION

This part of the chapter deals with a firm's decision to hire formal and informal workers and is based on Marjit et al. (2007c). We start our model in a simplified way where initially there is no capital requirement. Labour is the only input of production that is shared by the formal and informal sectors. The formal–informal distinction is captured through the assumption that the wage level in the former is higher than that in the latter. Such wage determination is beyond the control of a particular firm. Initially, we assume that there is no difference in the productivity of labour between the segments. Therefore, it is quite likely that the entire production should shift to the informal sector. However, this cannot be