Income Inequality, Taxation, and Growth[*]

Maria C. Kula[y] Daniel L. Millimet[z]

June 4, 1999

Abstract

Several recent papers addressing the role of income distribution in the growth process have focused on the role income inequality plays in the political process. Inequality is linked to pressure for high, redistributionary tax rates, which lead to low investment and therefore growth. Empirically, the correlation between high inequality and low growth has been robust. However, the intermediate step linking inequality to high taxes has not been empirically supported, and the link between taxes and growth has been found to be the opposite of that suggested by theory: an empirically robust relationship has been found between high taxes and growth. This paper presents a simple model which reconciles the intuitively appealing taxation approach to economic growth with these seemingly contradictory empirical findings.

JEL: D30, E62, H30, O40.

Keywords: Income Inequality, Fiscal Policy, Growth, Time Consistency.

---

[*]We thank John Driscoll, Oded Galor, Herschel Grossman, David Weil, and participants in the Brown University Macro Lunch for helpful comments. All errors are our own.

[y]Corresponding author. Economics Department, Box B, Brown University, Providence, RI. Tel: 401-863-2465. Fax: 401-863-1970. Email: Maria_Kula@brown.edu

[z]Southern Methodist University

1 Introduction

Several recent inquiries into the determinants of economic growth have focused on the role of income distribution in the growth process. In general, the approaches to this problem can be classified loosely into three groups: capital market imperfection, fertility, and political economy, with the last group being further subdivided into political stability and fiscal policy approaches.

In the fiscal policy approach, taxation links inequality and growth. Recent papers by Perotti (1993), Alesina and Rodrik (1994), and Persson and Tabellini (1994) in this area propose the following theoretical framework to explain the effect of inequality on growth: income inequality leads to populist pressure for redistribution, which results in distortionary taxation, which lowers investment and therefore growth. Although this chain of causation makes sense intuitively and the initial empirical evidence seemed to provide support (Persson and Tabellini (1994)[1], Alesina and Rodrik (1994)), the more recent empirical work of Perotti (1996) contradicts the internal predictions of these models. Perotti (1996) finds that while inequality does lower growth, it has no significant effect on taxation and that taxation actually has a positive effect on growth (Table 1.)[2].

This paper begins with the model of Persson and Tabellini (1994). By relaxing their restrictive assumptions concerning the voting process and adding assumptions about the behavior of the "rich", two conclusions are drawn: unlike in Persson and Tabellini (1994), predictions are obtained which

[1] Weede (1997) also finds empirical support for the hypothesis that distributional struggle hinders growth.

[2] These latter results could be explained by a possible endogeneity problem if, for example, countries with a high level of productive government spending leading to high rates of growth also have higher tax rates to finance the spending. Li and Zou (1998) consider the role of government spending by proposing a utility function with public consumption as an argument. However, their finding that income inequality is positively (although not always significantly) associated with economic growth runs counter to most other empirical work in this area.

are consistent with Perotti's empirical findings; additionally, the model indicates that inequality itself can have a detrimental effect on economic growth, whereas in previous works, it was the alleviation of inequality and not the inequality per se which was responsible for lower growth.

In Persson and Tabellini's (1994) two period model, individuals are endowed with different skill levels, which map to different income levels. When young, individuals vote on a tax rate in period one – before working, consuming, and saving – that will be used in the second period to redistribute income among the old, from those who saved more than average to those who saved less than average. Given the assumptions of the model, the median voter's preferences determine the tax rate; if he has less skills than average (and therefore less income than average), he will vote for a high redistributionary tax rate, thus linking inequality to high tax rates.

This paper relaxes the requirements that the tax rate is determined before savings decisions are made and that only one vote on the tax rate is allowed. The median voter's preferences will still determine the tax rate. A time consistent solution is obtained by assuming that the "rich" have an enforcement mechanism available to them which allows them to coordinate over their consumption decisions, thereby affecting the average level of savings in the first period such that the median voter prefers no tax. The poor are assumed to act atomistically and are unable to counteract the actions of the rich.

In particular, the rich will overconsume in period one, relative to their optimal consumption when there is no threat of redistributionary taxation, such that the median voter's savings equals the average amount of savings and he prefers no redistributionary tax. The link between inequality and high tax rates is broken, which is consistent with Perotti. The decreased savings by the rich implies lower growth, which is also consistent with Perotti's findings. Finally, in the absence of perfect information, the rich may accidentally oversave, resulting in the median voter preferring a redistributionary tax rate. In this case, we see high tax rates, and because the rich oversaved, higher growth. This explains the last piece of Perotti's findings: higher taxes imply higher growth.

The paper is organized as follows: section 2 presents the basic model; section 3 discusses the politico-economic equilibrium; section 4 analyzes the implications of the model; and section 5 contains some concluding remarks.

2 The Model

Consider a perfect foresight, two period overlapping generations model with no population growth. Individuals supply one unit of labor inelastically in the first period, save in the first period, and consume a portion of their income in both periods (Figure 1). There is no bequest motive. Agents have identical, homothetic preferences with a concave, well-behaved utility function:

$$v_t^i = U(c_{t-1}^i, d_t^i; \gamma) ; \tag{1}$$

where v_t^i is lifetime utility of individual i born in period $t-1$, c_{t-1}^i refers to consumption when young, d_t^i to consumption when old, and γ is an additive status parameter reflecting an agent's social standing within the economy. Those who are rich and act according to group norms derive utility from this fact ($\gamma = \bar{\gamma} > 0$). Violating group norms results in a large negative status effect, resulting in negative utility[3]. The poor have no status effect from being poor ($\gamma = 0$).

Assume there exists a democratic framework where individuals are allowed to call a referendum at any time prior to second period consumption and vote on a tax rate, θ, to redistribute income and wealth when old. For example, a particular generation could choose to vote at the start of

[3] That is, utility is obtained from having peers acknowledge your wealth; deviations incur others' wrath ("traitor to class" if do not observe group social norms).

the first period on the tax rate which will be implemented at the beginning of the second period, or the generation could wait and vote at the very beginning of the second period (Figure 1). In addition, more than one referendum may be held if there exists the desire to re-vote. The only restriction placed on the referendum procedure is that the most recent vote prior to second period consumption is binding. In other words, if a referendum is held in the first period, prior to the savings decisions, there exists the possibility of a new referendum at the start of the second period. This marks a departure from the model of Persson and Tabellini (1994).

The budget constraints for the i^{th} individual are

$$c^i_{t-1} + k^i_t = y^i_{t-1} \tag{2}$$

$$(1 + r)[(1 - \mu_t)k^i_t + \mu_t k_t] = d^i_t\ ; \tag{3}$$

where k^i_t is the individual accumulation of capital, k_t is the average capital stock in period t, and r is the interest rate, the expected marginal product of domestic capital[4].

Individuals are endowed with an identical set of basic skills, w. Additionally, agents have an individual-specific endowment of skills, e^i. As a result, income earned when young can be expressed as

$$y^i_{t-1} = (w + e^i)k_{t-1}\ ; \tag{4}$$

where k_{t-1} is the average capital stock per capita in period $t-1$.

Given homothetic preferences, individuals will have identical savings rates. Therefore, the distribution of income and second period wealth are determined by the distribution of e^i. Assume e^i has mean zero, a strictly negative median, is stationary over time, and that the distribution

[4] Given the empirical results of Feldstein and Horioka (1980), the interest rate in all countries is assumed to represent the marginal product of domestic capital.

is known to all agents.[5] As a result, each generation has an unequal distribution of income and wealth. The tax rate, μ, determines the amount of redistribution within each older generation, from those who saved more than the average to those who saved less. No intergenerational transfers are allowed.

To avoid any constitutional concerns, all people alive{ over a certain minimum age{ are allowed to vote in a given referendum; however, it is assumed that only those directly affected (i.e., members of the generation whose income will be redistributed according to the outcome of the vote on μ) will actually vote since there are time costs involved with voting and only those directly involved are affected by the outcome.[6] There is no coordination over voting; each individual votes according to his individual optimization condition.

Income inequality splits agents into two well defined groups: the rich and the poor. It is assumed that the rich have an enforcement mechanism which allows them to coordinate over their consumption decisions, thereby influencing the tax rate to be implemented in period two. For simplicity this enforcement mechanism is modeled simply as the "death penalty": any deviation by the rich is met with disapproval and banishment from the rich group, resulting in negative utility ($\gamma = 0$)[7].

---

[5] Since the expected value of e is zero, the marginal product of capital is equal to w; hence, $w = r$.

[6] Even if one argues that children (or parents, depending on when the vote is taken for a particular generation) derive utility from the parents' (or children's) well-being and therefore choose to vote, given the assumption of constant population, this will not affect the outcome of the referendum since every child (or parent) will vote identically to their parents (or child).

[7] Other mechanisms have been used to recognize group heterogeneity. For example, in Alesina and Drazen's (1991) war of attrition model, the rich and poor incur different costs when stabilization is delayed. Laban and Sturzenegger (1994) assume that the rich have access to a "financial adaptation technology" (off-shore accounts), while the poor

3 Equilibrium

A political equilibrium is defined as the tax policy which cannot be defeated by any alternative tax policy in a majority vote in a referendum prior to second period consumption. Recall that there is no coordination over voting; each agent votes according to his individual optimization decision. To determine the political equilibrium, the i^{th} individual must balance his desire for increased (decreased) redistribution with the realization that this action results in a lower (higher) base for redistribution. Each agent optimizes when these two effects exactly offset. Since the distribution of e^i determines the ranking of individual preferences, the equilibrium value μ^* is the tax rate preferred by the median voter.[8] Allowing multiple votes on μ, including after savings have been accumulated, implies that if $k^m < k$, that is, the median voter is poorer than average, then he votes for $\mu = 1$; otherwise, he votes for $\mu = 0$.

To determine the economic equilibrium, first consider the case where μ^* is zero (an economy without taxation). Under this scenario, all individuals save an amount such that the ratio of the marginal utility of consumption in the second period to the marginal utility of consumption in the first period equals $\frac{1}{1+r}$.[9] Given homothetic preferences, the relation between k and e is linear and upward-sloping, as all agents save at the same rate s (Figure 2). The area under this line corresponds to total national savings.

Now consider the case where $0 \leq \mu \leq 1$ is determined by the median voter and the rich agents can coordinate their actions. The rich will act strategically, such that the median voter prefers the lower tax rate. (The alternative is that if all act atomistically, the median voter prefers the higher

---

do not.

[8] Refer to Persson and Tabellini (1994) or Appendix A for a reconstruction of the proof.

[9] No discount rate is assumed.

tax rate. Savings would be very low or zero, resulting in non-smooth consumption across the two periods and very low utility.) In particular, the rich will act such that median savings k^m equals average savings k, so that the median voter prefers no redistributionary taxation. Call this their second-best solution.

Consider the problem from the viewpoint of a rich individual. Formally, each wealthy individual solves the following maximization problem in order to determine his second-best level of savings:

$$\max \quad U(c^i_{t-1}; d^i_t; \gamma) \tag{5}$$

$$s.t.: \quad c^i_{t-1} + k^i_t = y^i_{t-1} \tag{6}$$

$$(1+r)[(1-\theta)k^i_t + \theta k_t] = d^i_t \tag{7}$$

$$k^i_t + \sum_{j \in \omega_{-i}} k^j_t = \bar{K}^{\omega}_t \; ; \tag{8}$$

where the final constraint is previously not included in the the first-best maximization problem (the "no taxation possible" economy). $\bar{K}^{\omega}_t$ is the amount of aggregate savings allowed by the "rich group" so as to ensure that $k^m = k$ (and hence $\gamma = \bar{\gamma}$), and ω_{-i} refers to all wealthy individuals except person i.

Substituting the two budget constraints into the utility function and maximizing with respect to k^i_t subject to the aggregate savings constraint yields the following Lagrangian:

$$L \equiv U(y^i_{t-1} - k^i_t; (1+r)[(1-\theta)k^i_t + \theta k_t]; \bar{\gamma}) + \lambda[\bar{K}^{\omega}_t - k^i_t - \sum_{j \in \omega_{-i}} k^j_t] \; ;$$

where λ is the multiplier. The first-order conditions are:

$$\frac{\partial L}{\partial k^i_t} = -U_1 + U_2(1+r)[(1-\theta) + \theta \frac{\partial k_t}{\partial k^i_t}] - \lambda = 0 \tag{9}$$

$$\frac{\partial L}{\partial \lambda} = \bar{K}^{\omega}_t - k^i_t - \sum_{\omega_{-i}} k^j_t = 0 \; : \tag{10}$$

Rearranging terms and recognizing that the multiplier from the Lagrangian represents the marginal utility of savings which is the marginal utility of second period consumption, or U_2, yields the following conditions:

$$\frac{U_1}{U_2} = (1+r)[(1-\theta)+\theta\frac{\partial k_t}{\partial k_t^i} - \frac{1}{1+r}] \quad (11)$$

$$k_t^i = K_t^{\Omega} - \sum_{\Omega_{-i}} k_t^j \ ; \quad (12)$$

A few things to note. First, given the assumption of homothetic preferences, all wealthy individuals must have the same savings rate[10]. Second, since w and the distribution of e^i are known by all, each wealthy individual can solve not only his first-order conditions, but also the first-order conditions for Ω_{-i}. Equation (11) is the same for everyone, given the assumption of identical preferences; however, equation (12) differs. Therefore, if there are N wealthy people, there are $N+1$ independent equations and $N+1$ unknowns ($k_t^i; i = 1, ..., N$ and λ). Thus, a solution must exist.[11]

Finally, given θ^* is zero, equation (11) reduces to $U_1/U_2 = r$, not $1+r$, as is typically the case. Since $r < 1+r$, U_1 is lower in the second-best problem, and hence, first-period consumption is higher. Thus, each wealthy person's first-order condition dictates that their optimal savings should decline as a result of the threat of taxation. Each wealthy person can arrive at this solution independently and each knows the symmetric nature of the coordination: each simply reduces his saving rate to the new, lower level. The symmetric nature of the coordination provides support for

---

[10] This savings rate will differ, however, from the savings rate of the poor.

[11] Since the first equation in the system is non-linear, there may exist more than one solution. However, given homogeneous preferences, and suitable assumptions concerning the nature of the utility function (i.e., diminishing marginal utility from consumption), only one solution can maximize utility; in particular, the value of k_t^i closest to the first-best solution. Therefore, even in the presence of multiple solutions, each wealthy person will arrive at the same conclusion.

this solution as an equilibrium outcome. Recall that coordination among the rich is enforced via the punishment of being banished from the group ($\gamma < 0$) with the resultant negative utility[12].

The poor act atomistically, taking the strategic behavior of the rich as given (since there is perfect information, everyone knows the rich can and will coordinate). The poor expect $\theta = 0$ and act accordingly. Note that even if the poor could coordinate, no symmetric solution exists for their problem: either one poor individual reduces first period consumption by ϵ to offset the calcuations of the rich, or all poor agents reduce their first period consumption by ϵ/n; however, it would be difficult to enforce this latter scheme given that some poor are at the bottom of the income scale – the subsistence level – and would be unable to underconsume[13].

Thus we have the following result: the poor expect and behave as if $\theta^* = 0$. The rich act such that θ^* will be 0, meaning that they save less than if no taxation were possible in the economy. Graphically, the relation between k and e is kinked at the point $(0, k)$ and the equilibrium value of θ^* is zero (Figure 3).

[12] Since individuals live for only two periods, this is a one shot game. Besides banishment, pre-play communication or convention could also be used to defend the cooperative outcome (see Kreps (1990) Chapter 12). If children are identical to their parents (i.e. have the same skill levels), game theory results from repeated games could be applied here. As in single shot games, preplay communication, convention, and social norms can be used to explain the cooperative outcome as the equilibrium outcome. However, learned behavior (e.g. if the children know the results of the previous generation's game) can also support an equilibrium. As in single shot games, symmetry and efficiency, which are present here, are two important characteristics which point to likely outcomes. (See Kreps (1990) Chapter 14 for a review of the game theory literature on the question of which selfenforcing agreement agents will implement in repeated games.)

[13] If preplay communication were relied upon as a mechanism through which the rich could attain a cooperative outcome, but not the poor, this could be justified in that each rich agent has the means (income, time) to engage in this behavior, while each poor agent does not.

3.1 The Capital Levy Problem and Time Consistency

The solution used in this model to the time consistency problem which arises when taxes on capital can be applied after capital has been accumulated parallels a solution obtained in Fischer (1980). In his seminal paper, Fischer considers a two period model: in period one, consumers make a savings decision; in period two, the government taxes capital and labor income and chooses government spending. The command solution is determined by the maximization of utility subject to the budget constraints and the optimal capital and labor taxes are found. The problem arises in that once the second period begins, it is not optimal for the government to follow the command solution; since the labor tax is distortionary, it would be set to zero, and since capital has already been accumulated, its tax would be set to a high level. The time consistent solution is found by having the agents take the second period labor and capital taxes, as well as government spending, as given when they optimize and solve for their first period actions[14].

As discussed by Fischer, these rational expectations optimal taxes are Nash equilibria in a game with many players, whereas the command optimum corresponds to a cooperative equilibrium. If the private sector acts cooperatively, taxes on capital will be low; if they act non-cooperatively, taxes on capital will be high. In short, the second period tax rate depends on the behavior of the private sector in the first period. With his model, Fischer shows that if the private sector is induced to save the right amount in the first period, the command optimum is attainable. The solution presented in our model parallels the command optimum solution of Fischer. Here, however, to reflect group heterogeneity, not all agents have the ability to cooperate, just the rich.

[14] Chari and Kehoe (1990) present an infinite horizon version of Fischer's two period model. They focus on the reputation of the government as a substitute for commitment when the government cannot commit to capital taxes prior to capital accumulation

Note that Persson and Tabellini (1994) obtain a time consistent solution to the capital levy problem by assuming that the only vote on the tax rate is held prior to capital accumulation and that this tax rate is implemented in the second period (that is, they assume one period ahead commitment of policy). Alesina and Rodrik (1994) solve the problem by assuming that taxes are voted on at time zero only and that they are required to be constant over time[15]. Unlike Persson and Tabellini (1994) and Alesina and Rodrik (1994), utilizing the assumption that the rich coordinate over their savings decisions yields predictions consistent with Perotti's (1996) empirical work on inequality and growth.

4 Equilibrium Implications

In the end, the politico-economic equilibrium contains no positive taxation, but results in those individuals whose first-best solution has them saving more than average diverting income into first period consumption. What are the implications of this equilibrium? In Figures 2 and 3, the area under the line constitutes total national savings. In the second-best solution, consumption is shifted back to the first period by the wealthy and, as a result, the capital stock in the second period is smaller, resulting in lower growth. Thus, inequality lowers savings which lowers the growth rate.

[15] Krusell, Quadrini, and Rios-Rull (1997) calibrate a general recursive model with forward looking agents and sequentially determined policies in which agents consider all possible future policy outcomes when voting on the current period's tax policies. They find that Persson and Tabellini's two period model, in which voters do not need to forecast the outcomes of future votes when forming preferences over the tax rate, is consistent with their more general model. For the same reasons, our model also would be consistent with their more general model. However, they find that the model of Alesina and Rodrik is not consistent with their dynamic voting equilibria. They show that the equilibrium in Alesina and Rodrik cannot be supported either with unrestricted commitment to future tax rates at time zero (which leads to non-constant tax paths) or with sequential voting (which leads to higher tax rates).

Additionally, consider the following perturbation of the model. Relaxing the assumption of perfect information, it is plausible that the wealthy will err when choosing their second-best savings plan. Specifically, if the wealthy shift some consumption to the first period, but underestimate the optimal amount (i.e., the amount such that $k^m = k$), then in the second period $k^m < k$ will still hold and the median voter will set θ^* equal to one. Under this imperfect information scenario, the equilibrium will entail a positive tax rate along with lower savings and growth relative to the first-best outcome; however, savings and growth will be higher than if the wealthy had correctly solved their second-best maximization problem.

Combining the outcomes from the second-best case with and without perfect information, the model yields predictions consistent with Perotti's recent empirical study. Namely, (i) both positive and zero taxes are consistent with inequality, implying that inequality should have no statistically signifcant effect on the tax rate[16], and (ii) if two countries are identical in all respects except that in one wealthier individuals save exactly their second-best amount while in the other they save too much (i.e., they fail to divert enough from savings to first period consumption), then the country which oversaved will have both positive taxes and a higher growth rate, resulting in a positive correlation between taxation and growth.

[16] The fact that both positive and zero taxes are consistent with inequality implies that the constant term in a regression of tax rates on inequality will be positive (as it reflects the mean tax rate), but the coefficient on the inequality variable will be insignificant since knowing that inequality exists in one country and not another does not yield any ex ante information about the tax rate.

5 Conclusion

In the model, the choice of the tax rate does not have to be made until just prior to second period consumption. As a result, an additional level of strategy is introduced. If at the start of the second period the median voter is worse off relative to the mean, there will be a referendum called and a positive tax rate will be implemented. This "threat" of taxation forces the wealthy to shift consumption from the second period to the first period. Ideally, the wealthy would shift enough such that the median voter has exactly the average retirement income and there will be no taxation in equilibrium. This second-best solution is associated with lower savings and therefore the initial inequality is responsible for lower growth. In addition, the possibility of miscalculations allows for situations where the wealthy may save more than their second-best amount. In this case, the equilibrium will be characterized by positive taxation and higher growth relative to the second-best solution with perfect information (but still less than in the first-best case).

Thus, the final predictions of the model are:

(i) inequality lowers growth unambiguously

(ii) inequality does not have a significant effect on taxation

(iii) positive taxation, ceteris paribus, is associated with higher growth.

Not only do the results differ significantly from earlier models, but it is noteworthy that in previous models inequality per se was not harmful for growth; rather the process of redressing inequality (through distortionary taxation) was the culprit. In this model, the "threat" of taxation due to the existence of inequality and not the taxation itself is responsible for lower growth.

A Equilibrium if θ^* is Determined Prior to the Second Period

Each individual maximizes[17]

$$v_t^i = U(c_{t-1}^i; d_t^i; \gamma)^{18}$$

subject to

$$\begin{aligned}
(w + e^i)k_{t-1} &= y_{t-1}^i \\
c_{t-1}^i + k_t^i &= y_{t-1}^i \\
(1 + r)[(1 - \theta_t)k_t^i + \theta_t k_t] &= d_t^i :
\end{aligned}$$

Assume only one vote on θ is allowed, it occurs in the first priod prior to the savings decisions, and it is strictly enforced. Using the budget constraints and the fact that $d_t^i / c_{t-1}^i \equiv D(r;\theta)$, where $D_\theta < 0$ and $D_r > 0$, consumption by the i^{th} individual is

$$\begin{aligned}
d_t^i &= \frac{(1 + r)D(r;\theta)[(1 - \theta)y_{t-1}^i + \theta k_t]}{D(r;\theta) + (1 + r)(1 - \theta)} \\
c_{t-1}^i &= \frac{(1 + r)[(1 - \theta)y_{t-1}^i + \theta k_t]}{D(r;\theta) + (1 + r)(1 - \theta)} :
\end{aligned}$$

To arrive at the political equilibrium, differentiate v_t^i subject to the budget constraints and apply the envelope theorem to get

[17] This proof is based on Persson and Tabellini (1994).

[18] Note that in this case, time consistency is obtained via a binding vote before consumption occurs. Thus $\gamma = \beta$ for the rich and 0 for the poor.

$$\frac{\partial v_t^i}{\partial \theta} = U_d(\cdot)[(k^t - k_t^i) + \theta \frac{\partial k_t}{\partial \theta}](1 + r) :$$

This equation explicitly shows the trade-off between greater redistribution and a lower tax base.

Utilizing the above results,

$$k_t - k_t^i = \frac{-D(\cdot)k_{t-1}}{D(\cdot) + (1 + r)(1 - \theta)} e_{t-1}^i ;$$

which proves that those with low draws from the distribution of endowments, e, (i.e. $e_{t-1}^i < 0$) are poorer than average and those who receive good draws (i.e. $e_{t-1}^i > 0$) are wealthier than average. Thus, each person's preference for redistribution can be ranked by their value of e. As a result, the median voter theorem may be invoked.

Combining these last two equations, the equilibrium tax rate is defined implicitly by

$$-\frac{D(\cdot)e^m}{D(\cdot) + (1 + r)(1 - \theta)} + \theta D_\theta(\cdot)\frac{wr}{[(1 + r) + D(\cdot)]^2} ;$$

where the first term reflects the marginal benefit of redistribution and the final term is the marginal cost of the distortionary tax.

Therefore, if the median voter is poorer than average and must vote on the tax rate prior to the second period, $\theta^* \in (0;1)$ must hold.

References

[1] Alesina, A. and A. Drazen. 1991. "Why Are Stabilizations Delayed." American Economic Review, 81(5). pp. 1170-88.

[2] Alesina, A. and D. Rodrik. 1994. "Distributive Politics and Economic Growth." Quarterly Journal of Economics, 109(2). pp. 465-90.

[3] Chari, V. and P. Kehoe. 1990. "Sustainable Plans." Journal of Political Economy, 98(4). pp. 783-802.

[4] Feldstein, M. and C. Horioka. 1980. "Domestic Saving and International Capital Flows." Economic Journal, 90(358). pp. 314-29.

[5] Fischer, S. 1980. "Dynamic Inconsistency, Cooperation, and the Benevolent Dissembling Government." Journal of Economic Dynamics and Control, 2(1). pp. 93-107.

[6] Grandmont, J M. 1978. "Intermediate Preferences and the Majority Rule." Econometrica, 46(2). pp. 317-30.

[7] Kreps, D. 1990. A Course in Microeconomic Theory. Princeton University Press: Princeton.

[8] Krusell, P., V. Quadrini, and J. Rios-Rull. 1997. "Politico-Economic Equilibrium and Economic Growth." Journal of Economic Dynamics and Control, 21(1). pp. 243-72.

[9] Laban, R. and F. Sturzenegger. 1994. "Distributional Conflict, Financial Adaptation and Delayed Stabilization." Economics and Politics, 6(3). pp. 257-76.

[10] Li, H. and H. Zou. 1998. "Income Inequality is Not Harmful for Growth: Theory and Evidence." Review of Development Economics, 2(3). pp. 318-34.

[11] Persson, T. and G. Tabellini. 1994. \Is Inequality Harmful for Growth?" American Economic Review, 84(3). pp. 600-21.

[12] Perotti, R. 1993. \Political Equilibrium, Income Distribution, and Growth." Review of Economic Studies, 60(4). pp. 755-76.

[13] | {. 1996. \Growth, Income Distribution, and Democracy: What the Data Say." Journal of Economic Growth, 1(2). pp. 149-87.

[14] Weede, E. 1997. \Income Inequality, Democracy and Growth Reconsidered." European Journal of Political Economy, 13(4). pp. 751-64.

Table 1. Results from Perotti (1996)

Dep.Var.	GR	MTAX	GR	MTAX	GR	MTAX
Constant	004	164	005	185	020	.715
	(47)	(113)	(65)	(123)	(230)	(186)
GDP	-004	-021	-002	-022	-002	.715
	(-239)	(-150)	(-126)	(-137)	(-102)	(186)
MSE	004		040		-020	.715
	(38)		(288)		(-152)	(186)
FSE	001		-046		020	-020
	(10)		(-238)		(164)	(-98)
PPPI	-0005		008		-016	
	(-07)		(103)		(-164)	
MTAX	090		091		068	
	(361)		(3.73)		(318)	
MID		-096		-222		-1906
		(-19)		(-45)		(-142)
MID ¤DEM				-901		
				(-88)		
DEM				329		
				(99)		
POP65		3047		3553		4430
		(3.78)		(361)		(328)
nobs	49 (all)	49	49	49	27 (DEM)	27
R^2	22	30	24	29	30	29

Notes. From Perotti (1996) Table 8. t-statistics in parentheses. GR: avg. yearly growth rate of GDP per capita, 1960-1985. MTAX: avg. marginal tax rate between 1970 and 1985. MSE: avg. years of secondary schooling of the male population, 1960. FSE: avg. years of secondary schooling of the female population, 1960. PPPI: PPP value of the investment de° ator, relative to US, 1960. MID: share in income of the third and fourth quintiles, in or around 1960. DEM: democracy dummy variable. POP65: share of population over 65. Columns (1) through (4) contain results for the entire sample of 49 countries that Perotti studies; columns (5) and (6) contain results for the subsample of countries de¯ned to be democracies.