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Growth, Distribution and Politics*

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Abstract

We start by arguing that to understand growth differences across
countries and time, one needs to understand differences in public policies
that affect the incentives for productive accumulation of capital, human
capital, or technically useful knowledge. And to understand policy
differences one needs to understand how political institutions aggregate
conflicting interests into public policies. We then survey some recent work
along these lines, which argues that more inequality leads to slower growth.
Next, we illustrate some of the basic ideas of this work, by help of a
simple model of taxation. We also present some econometric cross-country
evidence, which is largely supportive of the basic ideas. We end by
suggestions for further work.

Contents

Summary

A glaring fact of economic development is that growth rates across countries are very different. Explaining why growth rates differ is still one of the most challenging problems in economics. This paper discusses recent literature that attempts to explain the problem by focusing on the interaction between economics and politics.

The key to understanding differences in growth is to understand differences in public policies that affect the incentives for productive accumulation of capital, human capital, or technically useful knowledge. To understand these policy differences is to understand how political institutions aggregate into public policies the conflicting interests of a society.

The paper surveys recent work along these lines, which attempts to link politico-economic equilibrium policies to different aspects of income distribution. More inequality--in the distribution of income, as well as in the apportionment of income to different factors of production--may lead to slower growth. Greater inequality leads to more pressure for redistributive policies, which in turn curtail the incentives for productive accumulation.

To illustrate this basic idea formally, the paper presents a simple model in which taxation affects investment incentives. In one version of the model, greater inequality in the distribution of income lowers investment by increasing the general income tax. And in another version of the model, greater inequality in land holdings lowers investment by raising a sectoral tax that reallocates capital from the capital-intensive sector in the economy to the land-intensive sector.

Drawing on recent empirical work, the paper also presents some econometric cross-country evidence. The evidence is largely supportive of the theoretical predictions: income inequality is bad for growth, and land concentration is bad for growth.

The paper concludes with a number of suggestions for future research. Future theoretical research should analyze the joint dynamics of income distribution, policy, and growth. And future empirical research should try to identify more precisely the links between income distribution and redistributive policies and between these policies and growth.

I. Introduction

A glaring fact of economic development is the difference in the growth rate across countries. Table 1 displays the average growth rate of real GDP per capita between 1960 and 1985--as well as other statistical indicators of growth--in about 80 developing countries, grouped by continent. Asian countries have on average grown twice as fast as Latin American countries, and three times as fast as African countries. And the differences within each continent are much larger. Explaining these facts is still one of the most challenging questions in economics. In this paper we review some recent attempts at explaining them by focusing on the interaction of economics and politics.

Consider the stylized aggregate production function: $Y = AF(K,N)$, where Y is GDP, A is a measure of technology, K is "capital", and N is population. Any theory of economic growth must then ultimately explain the variables appearing on the right hand side of the following equation:

$$g^y = g^A + RI - \alpha g^N \tag{1}$$

In (1) g^y is the rate of growth of per capita GDP, g^A and g^N are the rates of exogenous technical progress and of population growth, R is the marginal product of capital, I is the investment rate (expressed as a percentage of GDP), and α is the income share of K. The early growth accounting literature as described a large share of growth to g^A. But the recent literature on endogenous growth has basically widened the definition of capital to include not only physical capital, but also other cumulable factors like human capital and productive knowledge.   Under this view, I in equation (1) includes all such productive accumulation, while residual exogenous technical progress, g^A, becomes a negligible number. Suppose further that the population growth rate is primarily determined by non-economic factors, and the capital share of income (broadly defined) is fairly constant across countries. 1/ We are then left with only two reasons for why countries grow at different rates: either their investment rates differ, or their marginal products differ. We now want to argue that economic policy, and in particular bad economic policy, plays a central role in explaining these differences.

Consider first the marginal product of capital, broadly defined. It is difficult to argue that in the slow growth African and Latin American countries the potential marginal product is lower than in the rest of the world. These are the countries where cumulable factors are scarce. Any reasonable economic model would then suggest that investment would be very productive, if anything more productive than elsewhere. So, if marginal

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1/ However, there is a literature that studies optimizing fertility choice and thus makes population growth the object of economic analysis (see, for instance, the recent paper by Barro and Becker (1990)).

products are low, it must be because realized marginal products are low. This could happen for a variety of reasons, but most of them have to do with policy. First, investment could go to the wrong sector or firm, or be the wrong kind of investment. 1/ Second, there may be indivisibilities that prevent investment on a sufficiently large scale. Third, high marginal product investment may be something like infrastructure, with a considerable public-goods component. And so on. But in all these cases, economic policy could either correct the distortions, or else is directly responsible for them. It seems plausible that a "benevolent dictator" in a poor African country would not face a lower physical marginal product of capital than elsewhere in the world. So, if slow growth is due to a low marginal product, we must ask why economic policy preserves a gap between the potential and the realized marginal product of capital in some countries but not in others.

Table 1. Average Growth Rates

	# of Countries	Growth 1960-85	GDP 1960	S.E. Growth	Range Growth
ASIA	23	3.08	1,434	2.28	-0.39,7.44
LATIN AMERICA	19	1.55	1,835	1.54	-1.61,4.79
AFRICA	41	9.96	585	0.94	-2.83,5.40

   Source: Summers and Heston (1988). The country groupings are based on the IMF classification. GDP 1960 is average per capita income in 1960.

   Consider next the investment rate. One reason why countries may invest little is that they cannot afford to save. As recently argued by Rebelo (1992) and Atkeson and Ogaki (1990), if income is very low the intertemporal elasticity of consumption may be low, and thus so may the savings rate. Taken literally, this argument says that poor countries prefer to grow slowly. More generally, it says that there may be a role for policy in attracting foreign direct investment. A second reason why the

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   1/ The contribution of foreign direct investment to GDP growth may be particularly important if there are indivisibilities or other non-convexities that keep the marginal product of capital low when capital is scarce. The relationship between foreign direct investment, domestic policy and growth has been recently studied by Cohen and Michel (1990).

investment rate differs across countries is more directly related to policy. The marginal product of capital, R in equation (1), need not coincide with the rate of return that can be privately appropriated by investors. Any externality or any explicit or implicit tax on investment income would create a wedge between them. Two countries with the same marginal product will have different investment rates if investors face different appropriable returns. Therefore, policies that define the property rights of investors become a major determinant of growth.

The new research program on "endogenous growth" stresses that differences in economic policy can play a major role in explaining differences in growth. Indeed, this research program has generated so much excitement because it is making progress on analyzing the growth consequences of alternative economic policies with the powerful tools of modern economic theory. 1/ However, the research on endogenous growth typically views the cross-country differences in economic policy as exogenous to the analysis. Policy plays the role of a free parameter in a theoretical model, or is an exogenous variable in cross-country regressions, as for instance in Fischer (1991) or in Easterly (1991). In a sense, the early development literature--with its emphasis on planning and government intervention--had a similar view of policy: an exogenous set of instruments that could freely be set to achieve desired results.

But this view of policy is hard to swallow. Economic policy does not vary randomly. Neither does it adapt freely to prospective policy advice. Rather, policy is the result of deliberate and purposeful choices by individuals and groups, who have specific incentives and constraints, just like private economic agents. Explaining why these choices differ systematically across countries is essential to answer the question of why countries grow at different rates. This is indeed the view of many modern development economists like Kreuger (1990), who sketches an ambitious research agenda, which entails theoretical and empirical work on the interaction between political and economic forces and the functioning of alternative institutions.

We very much agree with the agenda. And we believe that the best way to make progress on it is to borrow the insights from modern development economics and the tools from neoclassical economics. Operationally, this means that the theory of endogenous growth must be married with the theory of endogenous policy. 2/ The next section describes a recent body of research: the first offspring of this marriage.

1/ See for instance Barro and Sala-i-Martin (1992) and Rebelo (1991).
2/ The theory of endogenous economic policy has developed in two somewhat different traditions. One development--surveyed by Persson and Tabellini (1990)--is oriented towards macroeconomic policy and public finance. The other development--surveyed by Hillman (1989) and Magee, Brock and Young (1989)--is oriented towards trade policy.

II.   Property Rights and Economic Growth

This recent literature starts from the argument that the enforcement of property rights determines the incentives to invest in cumulable factors. To explain differences in growth rates, it attempts to explain why property rights are enforced differently across countries.

Benhabib and Rustichini (1991) address the question in a model without an explicit institutional structure or political mechanism. In their model, two groups of agents consume and invest. At any point in time, they may also try to redistribute consumption towards themselves from the resources available in the economy. The paper shows how the quest for redistribution may impose binding incentive constraints on the two groups, which manifest themselves in low accumulation and growth. It also shows how the incentives to redistribute may reduce growth at low, as well as high, levels of income. An advantage of this framework is its generality. Because the analysis is highly abstract, the results do not depend on the specific assumptions about the policy instruments or the political environment. But the generality is not without costs. One of them is that it becomes difficult to obtain precise testable implications.

Other papers on the topic are more explicit about the political mechanism and the policy formation process. A first group of papers studies conflict over the size distribution of income in a democratic society. The model of redistribution borrows from Meltzer and Richard (1981), where rational voters choose a linear income tax and the revenue is distributed lump sum. The outcome depends primarily on the degree of inequality among voters: more inequality make more voters favor redistribution, so that the equilibrium tax rate is higher. Persson and Tabellini (1991a) embed such a political mechanism in an overlapping-generations model, where redistribution is harmful for growth, and obtain the testable prediction that more inequality brings about slower growth. Perotti (1990) obtains a similar result in a model that focuses on educational investment, with the qualification that in a poor society, where educational investment is indivisible, more inequality may lead to higher growth. Similarly, Saint-Paul and Verdier (1991) show that more inequality may lead to higher growth if it leads to more redistribution in the form of public education.

A second group of papers focuses instead on conflict over the functional distribution of income. In Alesina and Rodrik (1991) and Bertola (1991) there are two kinds of factors: "capital", which is cumulable, and "labor", which is fixed. Different individuals own these factors in different proportions. The government taxes factor income directly and a tax on the cumulable factor is bad for growth. Under democratic government, the equilibrium policy depends on how factor ownership is distributed among the voters. If wealthy voters have relatively more "capital", these models again predict that income inequality is bad for growth because it leads to more capital taxation.

However, it is not evident that the government can redistribute directly from cumulable factors to fixed factors. The same observable input typically contains a combination of both fixed and cumulable factors, and there is no way to tax them separately. Thus, income from labor reflects a combination of human capital and a fixed input. And income from land reflects a combination of improvements to the quality and fertility of the soil and a fixed input. It is only to the extent that different observable variables contain different combinations of income from fixed and cumulable factors that economic policy can redistribute across factors. Along these lines, Persson and Tabellini (1991b) analyze a model of sectoral policy, where different sectors rely on different factors in different proportions. The government observes only the output produced in different sectors. But conflict over the functional distribution of income still drives the results, since individuals differ in their factor ownership. A policy that redistributes away from the "capital" intensive sector is bad for growth. So the model predicts that growth is slower if the owners of the fixed factor have a strong influence over sectoral policy. A good example would be a country where land owners have the balance of power and manage to induce a policy that favors agriculture at the expense of manufacturing. The next section illustrates some of these ideas in a common analytical framework.

III. A Simple Model

Individuals live for two periods and have the following preferences:

$$U(c^i) + d^i + f^i \tag{2}$$

A variable with an i superscript is specific to the ith consumer and a variable without such a superscript denotes an average. In (2) c denotes first period consumption, while d and f denote second period consumption of two goods, which are produced in different sectors. Good d is produced only with "capital" according to the linear technology: $d = k^d$. Good f is produced with capital and fixed input ℓ, which we call "land", according to the concave constant-returns technology: $f = F(k^f, \ell)$. Since the two goods are perfect substitutes in consumption, their relative consumption price is fixed at unity. Consumers may differ in two dimensions. They may have different first-period income and they may own different amounts of land. For simplicity, we assume that land cannot be traded, so land holdings only enter the consumer budget constraint in the second period. Finally, there is one-period ahead commitment: policy is chosen in the first period, but takes effect in the second period.

3.1 Income Taxes

Consider first a tax on second-period aggregate income, when tax revenue is distributed lump sum. Here sectoral differences do not matter, so we assume that all individuals own the same amount of land. Let e^i

denote the first-period income of the ith individual, and θ denote the income tax. Then the consumer budget constraints are:

$$e^i \geq k^{id} + k^{if} + c^i \tag{3a}$$

$$(1-\theta)(k^{id} + k^{if} + F_\ell \ell^i) + g \geq d^i + f^i, \tag{3b}$$

where F_ℓ is the partial of $F(k^f, \ell)$ with respect to ℓ, and where we used the fact that equilibrium returns to capital in two sectors are equalized. The government budget constraint is $g = \theta(k + F_\ell \ell)$, where $k = k^d + k^f$ is average capital. If we solve the consumer problem we find that individuals accumulate capital in direct proportion to their first period income. Using the government budget constraint, we can then write the ith consumer's indirect utility, v^i, as a function of policy θ:

$$v^i = v(\theta) - \theta(e^i - e). \tag{4}$$

In (4) $v(\theta)$ is the indirect utility of the average individual and e is average first period income. Since the tax distorts the savings decision and is purely redistributive, the average consumer has nothing to gain from it. Hence, $v(\theta)$ is strictly decreasing in θ. Clearly, then, individuals richer than the average are harmed by the tax, while individuals poorer than the average may gain from it, since the tax redistributes in their favor.

Suppose now that tax policy is chosen democratically, under majority rule. It is easy to show that the voters' preferences are single peaked. Hence, the equilibrium tax is that preferred by the median voter. The lower is median income relative to average income, the more the median gains from redistributing, and the higher is the equilibrium tax. Since a higher tax discourages investment, we obtain the testable prediction that investment is lower in more unequal democracies. Persson and Tabellini (1991a) used a similar framework embedded in an overlapping generations model, to derive the prediction that the equilibrium growth rate is a decreasing function of income inequality.

3.2 Sectoral Taxes

We now slightly modify the model to allow for a sectoral tax. Let the tax, τ, be a tax on the capital intensive sector, d. Again, the tax is chosen in period 1 enacted in period 2, and the proceeds distributed lump sum to all individuals. Since aggregate income no longer plays a central role, let us assume that all individuals have the same first period income, e. With preferences on the form of (2), everyone will save the same amount, k. The second period budget constraint can now be written as:

$$(1-\tau)k^d + F_k k^f + F_\ell \ell^i + g \geq d^i + f^i. \tag{5}$$

Consumers allocate capital optimally across time and across sectors, such that:

$$F_k(k^f, \ell) = (1-\tau) = U_c(e-k). \tag{6}$$

It is easy to show that these conditions make both k^d and k decreasing functions of τ, and k^f an increasing function of τ. Because $F_{\ell k} > 0$, the returns to land are increasing in the tax rate: $Q(\tau) = F_\ell(k^f, \ell)$, where $Q_\tau > 0$. Intuitively, a tax on the capital intensive sector drives down the marginal return to capital, reducing aggregate investment. And since capital flows to the land-using sector, the return on land rises.

Imposing the government budget constraint, $g=\tau k^d$, we can again write the indirect utility of the ith individual as a function of the policy and of his relative endowment. But here it is the relative endowment of land, not relative first period income, that matters:

$$v^i = v(\tau) + Q(\tau)(\ell^i-\ell). \tag{7}$$

Average indirect utility, $v(\tau)$ is decreasing in τ, since the tax distorts both the savings and the capital allocation decisions. Since $Q_\tau > 0$, we now obtain the result that individuals with less than average land are harmed by the tax, while individuals with more than average land may benefit from it, the more so the larger is their relative land endowment.

In the case of a sectoral policy, it is less plausible to think that it is chosen by majority rule, even in a democracy. The benefits of the policy are highly concentrated among a possibly small subset of individuals, while its costs are distributed among the population at large. It is thus reasonable to follow the tradition in the trade policy literature, of viewing policy as the outcome of lobbying or bargaining between different organized groups in society. 1/ Accordingly, we expect to observe more sectoral distortions when the individuals gaining from the policy have more intense preferences and are more organized; in this model, when land ownership is more concentrated. With this view of the political process, the model thus predicts that sectoral taxes on the capital intensive sector are higher, and aggregate investment lower, the more concentrated and organized is the ownership of the fixed factor in other sectors. Persson and Tabellini (1991b) embed a similar framework in a dynamic model with altruistic overlapping generations, and obtain the prediction that land concentration is harmful for growth. 2/

1/ See Hillman (1989) and Magee, Brock and Young (1989).

2/ A tax on the capital intensive sector here is bad for growth for two reasons. First, there is the disincentive to save, that was present also in the other model. Second, capital is driven out of the capital intensive sector, which is typically the sector which drives growth. This sectoral distortion further reduces the growth rate (on this point see also Easterly (1990)).

3.3 Discussion

To summarize, we have described a stylized model, where equilibrium policy depends on features of the distribution of income. First, the size distribution of income matters for the choice of a general income tax. Second, the functional distribution of income--and particularly the distribution of the fixed factor--matters for the choice of a sectoral tax.

However, the way income distribution shapes policy depends critically on political institutions, because it is political institutions that aggregate conflicting interests--that derive from different positions in the size and functional distribution of income--into public policy. On the one hand, we argued that in a democracy a general income tax is likely to reflect the preferences of the majority of the population. For this reason, we expect the tax to be higher in more unequal democracies. But this prediction does not apply to non-democracies, where there may not be any mapping at all from the income distribution of the population at large to the redistributive policy preferred by the decisive individual or group. On the other hand, we argued that a sectoral tax is more likely to reflect the intensity of preferences of those who gain, rather than the number of gainers and losers in the population. For this reason we expect policies that redistribute in favor of the sectors where factor ownership is more concentrated and organized. Moreover, since the political mechanism may not operate mainly through voting, but through other forms of participation, there is little reason to think that this result should be confined to democracies. On the contrary, we would expect organized lobbies and pressure groups to be able to shape sectoral policies both in democracies and in dictatorial regimes.

We would also like to add that the focus on tax policies in our simple model need not be taken literally. Taxation can be either explicit or implicit and many other policies are similar, in that they affect the incentives for productive accumulation and entail a redistributive component. Most important among general policies--policies that affect different sectors symmetrically--are probably some aspects of the regulatory system: patent legislation, enforcement of intellectual and general property rights. Most important among sectoral policies--policies that affect different sectors asymmetrically--are probably trade, industrial and regional policies, and sectoral regulation. Such policies can be analyzed in a similar way and with similar conclusions.

The observations in this section and the results in Sections 3.1-2 leave us with a number of testable hypotheses regarding the effect of income distribution on economic growth. First, growth should be higher in more equal democracies, but it should not be related to the size distribution of income in non-democratic countries. Second, growth should be lower in countries where land ownership is highly concentrated, irrespective of the form of government. The next section investigates the empirical validity of these hypotheses by means of some cross-country regressions.

IV. Some Evidence

As in our other work (Persson and Tabellini (1991a and b)), we estimate regressions of growth on income distribution and on other explanatory variables. Income distribution is measured at the start of the period over which we measure growth, so as to avoid reverse causation. The sample of countries is drawn from the Summers and Heston (1988) data set. The dependent variable is the average growth rate of per capital real GDP between 1960 and 1985 in a group of developing and industrial countries.

The sample size is constrained by the availability of data on income distribution and land ownership. Paukert (1973) provides data on the pre-tax income distribution of households around 1960 and in about 50 countries. Our measure of income equality is the fraction of income received by the third quintile of the distribution, MIDDLE. This quintile includes median income, and thus measures the distance between median and mean income. The higher is MIDDLE, the more equal is the distribution of income, so we expect it to have a positive effect on growth. A measure of concentration of land ownership is provided by Taylor and Hudson (1972) and by Taylor and Jodice (1983), who compute a Gini coefficient for the distribution of land ownership in about 70 countries, GINILA. We expect this variable to have a negative effect on growth. Combining these two sources, we are left with a sample of about 40 countries for which we have both measures of distribution. 1/

The other variables in the regressions are the same as in Persson and Tabellini (1991a and b) and control for other features of the economy that contribute to explaining growth differentials. They are: the percentage of the relevant age group enrolled in primary school, PSHOOL, as a measure of human capital; the initial level of real GDP per capita in 1960, GDP, as a measure of initial development; and the percentage of the labor force in the agricultural sector, AGRIL, as a measure of the structure of production as well as an additional measure of the relative political strength of the agricultural sector. All these variables are sampled at the start of the period. 2/

The results of the OLS estimation are shown in Table 2. In column (1) we report the basic regression, where all the variables have been included. The fit of the regression is very good for a cross section, all the estimated coefficients have the expected sign, and many of them are significantly different from zero. In particular, the coefficients on the two distributional measures have the right sign; GINILA is clearly significant, MIDDLE is not, strictly speaking, but still has a marginal significance level (p-value) of 0.145. Checking the residuals, reveals that

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1/ For 6 countries, GINILA, is observed in the early 1970s, but for all other countries it is observed in the early 1960s.

2/ The source for GDP is Summers and Heston (1988). The source for AGRIL and PSCHOOL is the World Development Report, 1988.

there is one outlier: Chad, with an average growth rate of -2.8 percent. Column (2) displays the same regression, once we drop Chad from the sample. The fit of the regression improves and all variables are now statistically significant. In the remaining regressions, we leave this outlier in the sample, even though the results continue to improve if we exclude it.

As we argued at the end of the previous section, the theory has more detailed predictions for the link between growth and income distribution in countries governed by different political systems. Specifically, we expect growth to be positively related to income equality in democracies but not in dictatorships. And we expect concentration of land ownership to have a negative effect on growth irrespective of the political regime. To test this more specific prediction, we add to the regressions a dummy variable, DEMOCRACY, taking a value of 1 for democratic countries and 0 otherwise. This variable is entered in the regressions by itself (to control for an independent effect of the political system on growth), and interactively with the two distributional variables: a DM suffix at the end of a variable indicates that it is interacted with DEMOCRACY. We expect to find MIDDLE to have a significant impact on growth only with interacted with DEMOCRACY, and the opposite result for GINILA. The results, shown in column (3), are weakly supportive of the theory. The estimated coefficients are of the sign predicted by the theory and MIDDLE has a much stronger effect on growth when interacted with DEMOCRACY, while the opposite is true for GINILA, also as predicted by the theory. But the coefficients on the distributional variables are not statistically significant (even though MIDDLEDM has a t-statistic of 1.814, p-value 0.083).

The problem is probably that there are too few observations. Most of the countries in the sample with both distributional variables are democracies (we only have data for 10 non-democratic countries), so there is not enough variability in the political regime. To gain observations, we then run two separate regressions. One where only income equality is included, and the other where only land concentration is included. Again, the income distribution variable is interacted with DEMOCRACY. The results, shown in columns (4) and (5), are now exactly as predicted by the theory. Equality of income is of the right sign and significant only when interacted with DEMOCRACY. And land concentration has the same negative effect on growth in democracies and non-democracies. 1/ As further discussed in Persson and Tabellini (1991a and b), these results are robust to the specification, to the measurement of income quality, to heteroskedasticity, and to the possibility of measurement error, and improve when we remove the outlying observation.

1/ The correlation coefficient between MIDDLE and GINILA is -0.28. This is not very high, but under the nul-hypothesis that both variables should be included in the regression, excluding one of them may bias the estimates.

Table 2. Growth, Investment and Distribution

Dependent variable	GROWTH					INVESTMENT
	(1)	(2)	(3)	(4)	(5)	(6)
# OBS	36	35	36	48	50	31
CONSTANT	5.093 (3.045)	4.575 (1.698)	7.315 (1.985)	4.189 (1.691)	5.600 (2.546)	4.886 (0.318)
GDP	—0.11E—2 (—4.112)	—0.91E—3 (—3.885)	—0.12E—2 (—4.199)	—0.99E—3 (—4.102)	—0.79E—3 (—3.902)	—0.12E—2 (—0.973)
PSCHOOL	0.038 (3.187)	0.029 (2.727)	0.034 (2.081)	0.024 (1.862)	0.029 2.494	0.123 (2.306)
AGRIL	—0.061 (—2.572)	—0.045 (—2.109)	—0.063 (—2.690)	—0.040 (—1.895)	—0.048 (—2.526)	—0.078 (—0.661)
MIDDLE	0.135 (1.466)	0.171 (2.076)	—0.067 (—0.475)	—0.042 (—0.343)		0.747 (1.743)
GINILA	—0.039 (—2.595)	—0.042 (—3.191)	—0.028 (—1.076)		—0.028 (—1.794)	0.038 (0.505)
MIDDLEDM			0.352 (1.814)	0.406 (2.484)		
GINILADM			—0.009 (—0.269)		—0.027 (—1.193)	
DEMOCRACY			—3.631 (—0.848)	—4.750 (—2.298)	2.014 (1.204)	
$\overline{R}^2$	0.540	0.556	0.563	0.427	0.481	0.365
SEE	1.258	1.111	1.225	1.376	1.232	5.544

Method of estimation: OLS.

From these results taken together, we conclude that the results are supportive of the theory: a more unequal size distribution of income is bad for growth in democracies, while more land concentration is bad for growth everywhere. These effects of distribution on growth rate are also quantitatively significant: a one-standard deviation change in MIDDLE and in GINILA both affect average annual growth by, at least, half a percentage point (according to the point estimates in Table 2).

Finally, the theory also has predictions for investment in cumulable factors. As explained in the previous section, distributional variables are important for growth because they affect the investment rate of different countries. In the last column of Table 2 we change the dependent variable, replacing the average growth rate with the average physical investment rate between 1960 and 1985 (the source is still Summers and Heston (1988)). 1/ The results are now less supportive of the theory. The size distribution of income enters with the correct sign and is almost significant. But land ownership is not significantly different from zero and has the wrong sign. In a sense this is not too surprising, since the measure of investment does not correspond with the implications of the theory. First, our measure of investment is the sum of public and private investment, while the theory only refers to private investment. Second, accumulation of human capital and of productive knowledge is not included in the measure of investment, while it should be according to the theory.

V. Conclusions

The main predictions of the simple theory outlined in the paper seem to be largely supported by the data. Income equality is good for growth, while land concentration is bad for growth. In principle, these facts are consistent with other, non-political, reasons for why income distribution and the distribution of land ownership influence growth. 2/ Our theory however also predicts that the distributional variables interact in a specific way with the form of government. This additional prediction is also consistent with the data, and thus discriminates in favor of a political explanation of why distribution matters for growth.

1/ We leave the other independent variables in the equation. PSCHOOL may not seem to belong there, but it does--according to some versions of endogenous growth theory--since human capital may increase the return to physical investment (see Romer (1990)).

2/ For example, Murphy, Shleifer and Vishny (1989), building on earlier work in development economics, has suggested another, purely economic, reason why more equality may be good for growth: you may need a sufficiently large middle class to generate demand for manufacturing products that is sufficient for a growth take-off.

The theory has predictions about the link between income distribution and policy and about the link between policy and growth. Future empirical research should try to identify both these links, rather than estimating reduced forms, as we have done in this paper. We think this is going to be pretty hard work though. As we argued in Section 3, "taxes" in the model can be interpreted in a variety of ways. These various general and sectoral policies are going to be hard to measure in a satisfactory way across countries.

The literature surveyed here has studied the link between income distribution at a point in time and policies affecting growth. But the evidence collected by development economists and economic historians suggests that the relationship between growth and income goes both ways: the literature on the "Kuznets curve" argues that income distribution is systematically related to the income level. 1/ Future theoretical research should try to study the joint dynamics of growth, income distribution and policy. This challenging task involves building a bridge between the literature surveyed here and the literature surveyed by Aghion (1991).

1/ Regarding the evidence on the Kuznets curve, see Williamson (1989) and Lindert and Williamson (1985) for an overview of the historical evidence, and Fields (1980) for an overview of the post-war evidence across developing countries.

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