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THE GROWTH OF GOVERNMENT*

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I. INTRODUCTION

By conventional budget and gross national product (GNP) measures, government's role in the allocation of resources has increased considerably over the last century, and the growth shows no sign of abating. As a result, governments everywhere in the developed world have moved from a sometimes trivial to a now uniformly considerable role in shaping national expenditures. My task will be to try to explain this growth and size. To do so, I am going to equate government's role in economic life with the size of its budget. This is obviously wrong since many government activities (for example, statutes and administrative rules) redirect resources just as surely as taxation and spending, but the available data leave no other choice. My operating assumption has to be that large and growing budgets imply a large and growing substitution of collective for private decision in allocating resources. But the main intellectual problem I want to explore is the sources of this substitution generally.

I first review the facts about the growth of government and some standard explanations. Since none of the explanations seems very satisfactory, I then present my own explanation, which focuses on the incentives to use a political mechanism to redistribute wealth. Finally, I confront my theory with some relevant data. The main result is counterintuitive: greater equality of private incomes increases the demand for political redistribution.

II. TRENDS IN THE SIZE AND GROWTH OF GOVERNMENT

Table 1 presents a few scraps of historical data on the ratio of government budgets relative to GNP in four developed countries. The data are meant only to illustrate the extent and durability of government growth. Since important sectors of government (for example, social security, local governments) are sometimes excluded, these data cannot be used to compare the size of government across countries. The data do show that government

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budgets have grown faster than GNPs since at least 1900, and that they may have grown more slowly before. A more precise date for the transition from decline to growth of government would center around World War I and its aftermath. Since then, without any important exception or reversal, the government/GNP ratio in these data has increased on the order of three- or four-fold.

More comprehensive data for two decades ending in the mid-1970s are summarized for the United States and the major developed economies in Table 2. They show the extent and growth of government spending at all levels relative to gross domestic product (GDP) according to international income accounting conventions. While these data are still less comprehen-

TABLE 1
TRENDS OF GOVERNMENT SPENDING/GNP, UNITED STATES AND THREE EUROPEAN COUNTRIES, 1860-1974

Country and Year		Approximate Ratio × 100	Percentage Change from Previous
United States	1870	12	
	1880	8	-30
	1900	8	0
	1920	13	+60
	1940	18	+40
	1960	27	+50
	1974	32	+20
United Kingdom	1860	10	
	1880	10	0
	1900	10	0
	1922	23	+130
	1938	23	0
	1960	30	+30
	1974	45	+50
Germany	1880	3	
	1900	6	+100
	1925	8	+30
	1935	12	+50
	1960	15	+25
	1974	15	0
Sweden	1880	6	
	1900	6	0
	1920	8	+30
	1940	12	+50
	1960	24	+100
	1974	27	+15

Sources: United States and United Kingdom: See Section V *infra*. Germany and Sweden: Brian R. Mitchell, *European Historical Statistics: 1790-1970*, (1975).

Note: All figures are generously rounded. The numerator for the United States and United Kingdom is spending by all levels of government and for Germany and Sweden *central* government receipts *excluding* social security taxes. For Germany and Sweden 1960 and 1974 total government/GNP ratios are 35, 41 and 32, 49.

sive than we would like (see note to Table 2), they seem to reveal the following broad patterns.

(1) The relative size of the government sector in the typical developed country expanded by over one-third in the two decades, from just over a quarter to around two-fifths of the GDP.

(2) The growth accelerated markedly in the last decade, which accounts for about three-quarters of the total growth.

(3) This accelerated growth is evident both in direct consumption and in transfers. However, transfers have been growing two or three times faster per year than government consumption throughout the period.

(4) The higher recent growth rates also seem slightly more variable across countries, so that the spread among the sizes of their public sectors has widened. The growing importance of transfers, which vary more than consumption, provides an arithmetic explanation for this widening dispersion.

(5) The U.S. government sector has been a comparative laggard. Essentially, the rest of the world has caught up to the United States in public consumption. And despite doubling the share of its GDP going to transfers, the United States has made only a modest dent in the rest of the world's lead in transfers. More specifically, the locus of the United States's lag is its defense sector. By 1974 only Australia and Japan had smaller public sectors than the United States.

III. SOME EXPLANATIONS FOR THE TRENDS AND THEIR DEFICIENCIES

The literature on the size of government uses two modes of analysis for explaining the trends just described. The first focuses on specific historical events as the primary cause, whereas the second focuses on a market for "public goods." Both types of analysis demonstrate considerable variety which this brief summary cannot hope to reflect adequately. This is especially true of the first type, which prevails in studies of particular countries and time periods where questions of the generality of the analysis tend to be deemphasized.

One widely known example of the historical mode of analysis is Peacock and Wiseman's study of the growth of British government, which develops what has come to be called the "displacement-concentration" hypothesis.¹ Briefly put, the government/GNP ratio tends to be a constant until it is displaced upward by a national crisis—war, in the specific case at hand. This displacement is not completely offset at war's end, first, because the expanded bureaucracy is now better able to assert its interests and, second,

¹ Alan T. Peacock & Jack Wiseman, *The Growth of Public Expenditure in the United Kingdom* (Nat'l Bureau Econ. Research, 1961).

TABLE 2
SIZE AND GROWTH OF GOVERNMENT EXPENDITURES/GDP, U.S. AND 16 DEVELOPED COUNTRIES, 1953-1974

Expenditure Category and Country	Year (Ratio \times 100)					Percentage Change from Previous Ten Years	
	1953-54 (1)	1958-59 (2)	1963-64 (3)	1968-69 (4)	1973-74 (5)	1963-64 (6)	1973-74 (7)
<u>Total Government</u>							
United States	27.0	27.5	28.0	31.1	32.2	4%	15%
Avg. of 16 countries	28.9	29.9	31.7	35.8	39.4	10	24
SD of 16 countries	4.1	4.3	4.8	5.9	7.2	9	12
CV of 16 countries	14.1	14.2	15.0	16.6	18.3		
<u>Total Government Less Defense</u>							
United States	14.7	17.6	19.6	22.1	26.5	33	35
Avg. of 16 countries	24.4	26.2	28.2	32.6	36.7	17	30
SD of 16 countries	4.7	4.5	4.6	5.9	7.0	13	14
CV of 16 countries	19.1	17.1	16.3	18.2	19.0		
<u>Government Consumption</u>							
United States	21.5	20.8	20.5	22.4	21.2	-4	3
Avg. of 16 countries	17.2	17.2	18.2	19.8	20.9	7	15
SD of 16 countries	2.7	2.4	2.5	3.4	3.6	12	11
CV of 16 countries	15.8	14.2	13.7	17.4	17.1		

TABLE 2 (Continued)

Expenditure Category and Country	Year (Ratio \times 100)					Percentage Change from Previous Ten Years	
	1953-54 (1)	1958-59 (2)	1963-64 (3)	1968-69 (4)	1973-74 (5)	1963-64 (6)	1973-74 (7)
Transfers							
United States	5.5	6.7	7.5	8.7	11.0	36	46
Avg. of 16 countries	11.9	12.9	13.8	16.2	18.8	23	38
SD of 16 countries	4.3	4.2	4.3	4.9	5.9	23	23
CV of 16 countries	36.4	32.5	31.0	30.2	31.6		

Sources of Data: Organization for Economic Cooperation & Development, National Accounts of OECD Countries, various years for all countries except United States. United States data from Council of Economic Advisors, Economic Report of the President (1976).

Notes: Numerator for columns (1)-(5) is current revenue of all levels of government plus net borrowing if any (that is, any net lending to other sectors is not deducted). The data are classified according to the United Nations' new System of National Accounts (SNA) in which receipts and expenditures of separately incorporated nationalized industries are excluded from the government sector. However, subsidies and loans made by governments to nationalized industries are included.

Government consumption includes purchases of goods and services, gross capital formation, and wages paid to government employees. Transfers include subsidies, social security benefits, and interest on debt. (This breakdown is unavailable for Switzerland.)

The sample includes: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States. These countries have adopted the new SNA at different times. Where a particular series could not be reconstructed from the previous SNA, it was spliced to the series from the new SNA.

The denominator is gross domestic product at market prices (that is, includes indirect taxes), which is essentially equal to GNP. The ratios in columns (1)-(5) are averages for the two years indicated. "SD of 16 countries" is the standard deviation of the level or percentage change for the 16 (or 15) country sample, and "CV of 16 countries" is the coefficient of variation.

The years 1975-1976, the last for which I have data, show a marked acceleration of government growth. The first two figures under "Total Government" for these years would be 34.8 (U.S.) and 43.0 (16 country averages). The growth from 1973-1974 is on the order of 40 or 50% that of the entire preceding decade. Although none of the qualitative conclusions is thereby affected, I exclude 1975-1976 because they may atypically bear the brunt of the effects of the most pronounced worldwide recession since the 1930s.

because the war concentrates power at the national level. This concentration of power limits the restraint on taxes provided by competition among localities.

A glance at the British and American data underlying Table 1 (see Figures I and II in Section V) indicates some of the attraction of this generalization. The British variable fluctuates around .10 from 1880 to World War I, when it leaps to a high over .5. From 1920 to World War II, the ratio fluctuates around .20 to .25, when it is again displaced upward and then declines only to a range between .3 and .5. The U.S. data also show a ratcheting effect of the two wars, but much less pronounced than for Britain.

This hypothesis has been evaluated critically elsewhere,² but a few simple facts can illustrate its problems. Consider the sixteen countries summarized in Table 2. Half were active combatants for most or all of World War II (Australia, Canada, Germany-Austria, Italy, Japan, the United States, and the United Kingdom). The rest did not enter the war or were defeated quickly. The first group ought to have (a) larger public sectors just after the war and/or (b) more rapid growth since then. In fact, the 1953 government/GDP ratios are nearly the same (28.2 for the combatants versus 29.7 for the rest), and the noncombatants' ratios have grown significantly *more* rapidly since then (the difference in mean growth rates to 1974 is 22.2 per cent, $t = 2.09$). From today's vantage, participating in a major war seems ultimately to limit the size of government.

The displacement-concentration hypothesis implies that high and increasing centralization of government produces large and growing governments. This notion plays an important role in Niskanen's interesting contributions to the "specific-event" literature.³ I put Niskanen in this category because, even though he develops a general model of bureaucracy, he ultimately relies on a few specific events exogenous to his model to explain the size and growth of government.

Niskanen's model contemplates a bureaucracy that values larger budgets and always has some power to extract budget dollars from a legislature that values bureaucratic output. An important constraint on the bureaucracy's ability to gain unproductive budget dollars is competition among bureaucrats and among jurisdictions. Thus, institutional developments that weaken competition imply growing budgets. Among these developments, Niskanen cites centralization of governmental functions, the consolidation of governmental functions into fewer bureaus, and enhancement of bureaucratic

² D. Davies, *The Concentration Process and the Growing Importance of Non-Central Governments in Federal States*, 18 *Public Policy* (1970).

³ William A. Niskanen, *Bureaucracy and Representative Government* (1971); and his *Bureaucrats and Politicians*, 18 *J. Law & Econ.* 617 (1975).

tenure (civil service). He gives these factors greater weight than increases in the "rational ignorance" of legislators, another source of a bureau's monopoly power.

A primary difficulty with this theory, one which Niskanen explicitly recognizes, is its treatment of centralization of bureaucratic power as an exogenous event. An obvious alternative is that the same forces generating growth of government generally produce conditions facilitating that growth. This may help explain the temptation to fall back on discrete events, like wars, to rationalize subsequent growth of government. Another difficulty stems from the model's sketchy outline of the relationship between politicians and bureaucrats. Politicians do not benefit directly from bureaucratic budgets, and Niskanen presents evidence that they lose votes from marginal budget expansions.⁴ (This is meant to corroborate the model's implication that bureaucracies are able to "overexpand.") But the estimated size of this loss—the elasticity of votes lost by an incumbent president with respect to federal revenues during his term is about .6—is easily large enough so that modest reductions of expenditures would have changed the results of some recent elections. In that case, one has to wonder how "rational" it is for politicians to "ignore" bureaucratic expansion.

However, there are clear factual problems with the general-concentration hypothesis taken on its own terms. The evidence that high or rising concentration of government function is essential for large or growing government is weak at best. One measure of concentration is the fraction of all government revenues collected nationally. It is, to be sure, imperfect, because national policies can affect incentives to tax locally.⁵ For the United States, the broad trend of this measure supports Niskanen, in that centralization is now higher than in 1900 (about .60 versus .35). However, most of the increase took place in World War II, which is fifteen to twenty years after the persistent growth of the government/GNP ratio began. Growth since 1950 has been accompanied by a mild (about .10) decline in the centralization ratio. A comparison of the developed countries' recent experiences also yields weak support for the role of centralization. What seems most impressive about (measured) centralization is its temporal stability in the face of the considerable worldwide expansion of public sectors in the past two decades. Only Canada has experienced a larger change than the United States (also toward decentralization), and nowhere else has the centralization ratio changed by more than .10. Thus, increased centralization can hardly have

⁴ Niskanen, *Bureaucrats and Politicians*, *supra* note 3.

⁵ Although Thomas E. Borchering, *The Sources of Growth of Public Expenditures in the United States, 1902-1970*, in *Budgets and Bureaucrats: The Sources of Government Growth* 53-54 (T. E. Borchering ed. 1977), summarizes evidence that this is unimportant, at least for the United States.

TABLE 3
REGRESSIONS OF SIZE AND GROWTH OF GOVERNMENT
ON CENTRALIZATION MEASURES, 1953-1973,
(16 Developed Countries)

Dependent Variable	Coefficient (<i>t</i> -ratio)		\bar{R}^2 SE
	Centralization 1953	Growth of Centralization 1973	
(1) Government Spending/GDP 1953-1954	.097 (1.161)		.09 4.2
1973-1974		.218 (1.965)	.22 6.7
(2) Growth of Government/GDP 1953-1954 to 1973-1974	.121 (.343)	.275 (.571)	.05 17.1

Source: Organization for Economic Cooperation and Development, National Accounts of OECD Countries. Variables (all $\times 100$).

Notes: Centralization: Current Revenues of National Government/Current Revenues of All Levels of Government in year indicated or closest year for which data are available. Series spliced to current SNA where appropriate.

Growth of Centralization: log change of centralization over 20-year period (or extrapolated to 20 years, where required).

Government Spending/GDP: see Table 2.

Growth of Government/GDP: log change of Government spending/GDP over 20-year period.

played a crucial role in recent growth. The role of centralization is shown a bit more systematically in the regressions of Table 3 which relate the size and growth of the government/GDP ratio to the level and change in centralization. The simple correlation of levels is weakly positive, and in 1973, even significant. However, neither the extent of centralization nor the small changes in centralization seem to explain much of the growth of government. The meager support these results provide for the centralization hypothesis still has to confront the potential endogeneity of both the level and growth of the centralization variable. The "special-event" explanations of centralization may not be adequate; for example, of the eight full-time combatants in World War II, five rank among the *least* centralized half of our sample in 1953 (or 1973). Centralization of political power can clearly occur without a major war.

In its application to the problem at hand, the "public goods" model is more an analytical framework than the expression of a single widely accepted theory of government expenditure. The common strand of the literature is the treatment of expenditures as the implicit or explicit outcome of a market for government services. That is, demand and cost conditions for publicly provided goods determine expenditures. A vast empirical literature, much of it concentrated on cross-sectional analyses of local government finance,⁶ fits

⁶ See Roy Bahl, *Studies in the Determinants of Public Expenditures: A Review*, in *Sharing Federal Funds for State and Local Needs* (F. J. Mushkin & J. F. Cotton eds.) (Brookings Inst., 1968).



this mold, even though much of it is so ad hoc that even this very general categorization is risky. The prototypical procedure goes back at least to Brazer.⁷ It consists of regressing aggregate or individual service expenditures on a list of variables which shift the constituents' demand for them (for example, personal income, education) and the government's cost of providing them (for example, wage rates, population densities). A somewhat more theoretically sophisticated branch of this literature tries to take account of the political process that mediates this market or the indivisibilities that the traditional normative theory of government implies will characterize publicly provided services. But these factors have little impact on empirical practice. For example, the well-known collective choice model⁸ in which politicians cater to the preferences of the "median voter" is sometimes cited.⁹ However, there is no overall consensus that, say, median income is a better proxy for this demand than average income.¹⁰ Similarly, discussions of the "publicness" of government services often serve to rationalize inclusion of, say, a population variable and help in the interpretation of its effect.¹¹

For present purposes, an adequate summary of this literature would be an equation like

$$E = bY + cP + dN + A',$$

where (all variables are logs)

E = real per capita (N) government spending;

Y = real per capita income;

P = relative price of a unit of public services;

A' = all other factors;

b, c, d = elasticities with $b > 0$ if public goods are normal,

$d < 0$ if there are "publicness" scale economies, and the sign of

c is dependent on the price elasticity of the demand for public goods

($c < 0$ if this elasticity > 1).

It is sometimes argued that government shares with other service industries

⁷ Harvey Brazer, *City Expenditures in the U.S.* (Nat'l Bureau Econ. Research, Occasional Paper No. 66, 1959).

⁸ Howard R. Bowen, *The Interpretation of Voting in the Allocation of Economic Resources*, 58 Q. J. Econ. 27 (1943); Anthony Downs, *An Economic Theory of Democracy* (1957); Gordon Tullock, *Towards a Mathematics of Politics* (1967).

⁹ See, for example, Theodore C. Bergstrom & Robert P. Goodman, *Private Demands for Public Goods*, 63 Am. Econ. Rev. 280 (1973); and Thomas E. Borcherting & Robert T. Deacon, *The Demand for the Services of Non-federal Governments*, 62 Am. Econ. Rev. 891 (1972).

¹⁰ See James L. Barr & O. A. Davis, *An Elementary Political and Economic Theory of the Expenditures of Local Governments*, 33 S. Econ. J. 149 (1966), for an explicit test of the median voter model.

¹¹ Again see Bergstrom & Goodman and Borcherting & Deacon, *supra* note 9.

a labor intensive production function,¹² so P will increase with wage rates. Since wage rates increase with Y over time and cross-sectionally, it is adequate to write this as

$$\begin{aligned} P &= F + hY \\ h &= \text{constant, } 0 < h < 1 \\ F &= \text{"other factors."} \end{aligned}$$

Then, focusing on the government/income ratio, our equation would be

$$\begin{aligned} e &= E - Y = (b + ch - 1)Y + dN + A \\ A &= A' + cF. \end{aligned}$$

It is clear that secular population growth could hardly explain the secular growth of e since d is supposed to be negative. In fact, it turns out that $d \approx 0$ is the better summary of the empirical results, at least for aggregate expenditures.¹³ Thus, we have to focus on the coefficient of Y if this model yields insights about e . The simplest explanation, which goes by "Wagner's Law," is that $b > 1$. However, this law remains to be enacted: Borchering's survey of the empirical literature finds $b = .75$ a more plausible central tendency.¹⁴ If so, there remain the price effects (ch) as a potential source of secular growth in e . Again, I rely on Borchering's survey for an estimate of $c \approx +.5$. To get at h , note that real GNP increased at 3.2 per cent annually from 1929 to 1974, the private-goods and services deflator at 2.5 per cent, and the government-goods and services deflator at 3.9 per cent. These percentages imply an h around .4 to .5 $\left(\frac{3.9 - 2.5}{3.2}\right)$. Rounding up, we get

$ch \approx .25$ and the whole coefficient of $Y \approx 0$. On this admittedly crude summary of conventional income and price effects, e should thus be a constant over time or across space. In fact, simple cross-sectional data are roughly consistent with trivial total income effects. For example, note the following elasticities (t -ratios) from regression estimates of the equation for e for our sixteen-nation sample:

	1953-1954	1973-1974
Income	.035 (.464)	.059 (.297)
Population	.0003 (.0089)	-.075 (1.916)

¹² See William J. Baumol, *The Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis*, 57 *Am. Econ. Rev.* 415 (1967).

¹³ See the summary in Borchering, *supra* note 5.

¹⁴ *Id.*

The one result here that is distinguishable from zero (the last population elasticity) makes growing government more rather than less intelligible, given secular population growth.

A cross section of U.S. states yields similar results. In Table 4, per capita budget measures are regressed on per capita income and population for 1942, 1957, and 1972 (lines 1-3). The income elasticities here are a little below unity, but the shortfall seems mainly due to transitory components of income. The temporal transitory components can be reduced by averaging over time. When we do this (lines 4 and 5), the income elasticities move closer to unity. Other income components may be transitory across space: one state may temporarily gain some income lost by another. As a crude correction for this, I aggregated states into census regions. The regressions on the census region data (lines 6 and 7) yield income elasticities of almost precisely unity, just what our crude summary of the literature would lead us to expect and what we found for the cross-nation sample. The state and local data, in whatever form, also yield the negative but numerically trivial population elasticity alluded to above.

The main purpose of this brief summary and extension of the empirical public-goods literature is to establish a foundation for the subsequent empirical work on the size and growth of government relative to income. The main virtue of the "public-goods" framework is precisely its suggestion that the government/GNP ratio is a variable of prime analytic interest. When the framework is given empirical content, it suggests that this ratio ought to be roughly a constant across space and time. This is the happily fortuitous counterpart of the unit income elasticity and near-zero population elasticity. We are then left with the mystery, which we shall try to resolve, of why this ratio has in fact grown over time and varies considerably across space.

A cursory glance at recent history may help explain why "public-goods" models have not resolved that mystery. The public-goods paradigm characteristically is concerned with collective decisions about classically indivisible "community goods." It seems reasonable to expect broad community agreement to expand these provisions with community income. That agreement, however, ought to be less broad for much of what government today in fact does. For example, about half of the typical developed country's public spending today goes for direct transfers, the community-wide benefits of which are dubious. Similar doubts arise about many public-consumption expenditures. For example, the human-capital literature makes clear that there is a large private element in the returns from public provision of education (about one-quarter of government consumption in the United States). And historical evidence indicates that these private returns elicited a considerable private supply which has not clearly been enhanced by subse-

TABLE 4
REGRESSIONS OF STATE AND LOCAL PER CAPITA EXPENDITURES OR RECEIPTS ON INCOME AND POPULATION
(1942, 1957, 1972, U.S. 48 States)

Dependent Variable (Per Capita)	Coefficients/ <i>t</i> -ratios of				<i>R</i> ²	SE	<i>N</i>
	Income per Capita	Population	1957	1972			
1. Revenue, includes federal aid	.802 ¹ 14.87	-.056 -4.49	.382 6.92	.927 9.70	.975	.153	144
2. Revenue, excludes federal aid	.870 ¹ 16.55	-.035 -2.84	.297 5.53	.696 7.48	.974	.149	144
3. Expenditures	.860 ¹ 16.40	-.054 -4.41	.540 10.06	.980 10.55	.979	.148	144
4. Revenue, excludes federal aid: average of 3 years' data	.946 9.72	-.035 -2.06			.677	.116	48
5. Expenditures: average of 3 years' data	.897 9.25	-.048 -2.83			.659	.116	48
<i>Census Regions</i>							
6. Expenditures	1.029 12.12	-.046 ² 1.90	.553 6.56	.877 5.97	.994	.092	27
7. Expenditures: average of 3 years' data	1.072 5.54	-.022 ² .53			.846	.086	9

Sources: Expenditures and Revenue: U.S. Bureau of the Census, Census of Governments; and *id.*, Governmental Finances, various years. Income and Population: *id.*, Statistical Abstracts of the U.S. (1978).

Notes: All variables are in logs, except: 1957 = +1 for 1957, 0 otherwise; 1972 = +1 for 1972, 0 otherwise.

¹ Significantly different from unity.

² Population per state in region.

quent public provision.¹⁵ Whatever the community-good element in public education, a large indirect transfer is clearly involved in the typical public financing arrangements for it.

Such considerations suggest the riskiness of ignoring redistributive elements when analyzing the size or growth of government, and in the remainder of this paper I will focus on these elements. In doing so, I am not denying the importance of the collective-good aspects of public activity. However, my basic working hypothesis is that incentives to redistribute wealth politically are the more important determinants of the *relative* size and growth of the public and private sectors. This hypothesis entails deemphasis of governments' direct cost of collecting and redistributing resources. This does not have the same empirical basis as our deemphasis of public goods, in that evidence on the effect of, for example, modern communications and record keeping on tax-collection costs is lacking. Accordingly, most of the empirical analysis focuses on groups of governments where differences in tax-collection costs are plausibly minor. In the case of less developed countries where such differences may be large, collection costs are given an explicit role in the analysis.

In the next section, I elaborate a model of the incentives to political redistribution of income, which shows how these incentives are related to the distribution of income that would prevail in the absence of political redistribution.

IV. THEORY OF THE EQUILIBRIUM SIZE OF GOVERNMENT

I treat government spending and taxing as a pure transfer. This is, of course, only meant to focus issues, and the literal-minded reader can interpret spending as an increment over expenditures of a purely public-goods character. I also assume that the amount of spending is determined entirely by majority-voting considerations. This assumption also should not be interpreted literally, since it is meant only to highlight an important difference between political and private resource allocation. What is essential here is simply that popular support contributes to the viability of public policies, so that more such support is better than less. Part of this support may eventually be traded for other goods—monetary gain, relaxed relationships with the bureaucracy, and so forth—but I eschew development of a multifaceted objective function for simplicity. In particular, there is no need to confine the analysis to democratic systems. As long as suppressing dissent is costly to a dictator, he ought to be sensitive to the popular support for his policies. In

¹⁵ For example, E. G. West, *Education and the State: A Study in Political Economy* (Inst. of Econ. Affairs, 1965).



the empirical work I touch on the question whether redistributive considerations are more important in democratic governments.

My analysis of the democratic case can best be understood as a two-step process. The first consists of a search for a politically "dominant" redistributive program, which, speaking loosely, yields the greatest benefits for the greatest number. Once that policy is described, I take a large second step by assuming that competition among politicians will lead them to converge on that policy in their platforms and implement it upon election. Hence, I brush past the rather formidable problems connected with the uniqueness and stability of political equilibrium.

What then is meant by a "politically dominant" policy? I am going to assume that political preferences are motivated purely by self-interest. A voter will favor only those policies which promise to benefit him; social altruism plays no role. Any redistributive policy creates gainers and losers, and thus, in my scheme, potential supporters and opponents. But we need to know more than who gains or loses from a policy if we want to find the policy that will attain the widest support; the per capita stakes will also be important. To illustrate, consider a proposal whereby all of J. Paul Getty's wealth would be confiscated and redistributed equally to everyone else. This policy would maximize the number of beneficiaries, but it is unlikely to dominate alternative policies. Getty and those closely linked with him would oppose it, since they would do no worse. Perhaps Rockefeller and a few other wealthy individuals would favor it, more out of gratitude for being spared Getty's fate than for the trivial share of Getty's wealth they receive. However, most of the beneficiaries would oppose this proposal, for they could surely do better by waiting for a politician to come along and propose the expropriation of both Getty and Rockefeller. Indeed, they would continue to withhold support until a candidate came along who proposed a policy that maximized their benefits.

Of course, the identity of "they" is changing in this scenario: Rockefeller is converted from a beneficiary to a loser in the second round of this political competition. The outline of a politically dominant policy should, however, be clear. It is the policy that maximizes the difference between the number of beneficiaries perceiving the policy as the best deal and losers perceiving it as the worst deal. In a world of certainty and homogeneous beneficiaries, those perceptions should be identical among individuals. We assume neither certainty nor homogeneity. In the more general case, beneficiaries, for example, are more likely to perceive a policy as "best" the greater the per capita gains it promises, and the policy which receives most support will be the one that maximizes the *product* of the number of beneficiaries and the fraction of these perceiving it to be the best deal.

My first task will be to formalize this description of the politically domi-

nant policy, so that we can say something about its characteristics and, crucially, about the forces which shape it. Given our twin assumptions that political competition leads actual policy to converge on the dominant policy and that incentives to redistribution drive the size of government, we can then derive predictions about the forces that shape the size of government. Important among these, I will argue, is the distribution of income.

A. *Full Information*

As a convenient starting point, I assume a world of fully informed voters. Each voter understands costlessly the details of a proposed policy and its implications for his well being. He does *not* know with certainty what other proposals may be offered, nor does he necessarily ignore nonredistributive issues (for example, the charisma or ethics of candidates). All that will matter is that, having understood the nature and consequences of a policy, he is more likely to vote for the candidate offering it the more it would materially benefit him. The purpose of assuming full knowledge is both methodological and substantive. It helps to show where the political system is driven when knowledge becomes less costly, and it helps isolate the effects of ignorance, which I consider subsequently.

There are two relevant pools of voters: those whom the policy proposes to tax (let their number be Q) and those who will be paid (P). Let us first focus on the P 's, and the political support they will offer for a policy. In line with our previous discussion, this support will be $P \cdot F$, where F is the fraction of the P 's who prefer this particular policy to all others that they may possibly face (that is, "pie-in-the-sky" will not be well received). This fraction can, in principle, vary between -1 and $+1$. When F equals -1 , every P is sure he can do better by favoring an alternative policy and they all oppose this one, so "support" equals $-P$. When F equals $+1$, every P is sure he can do no better and all support it. One obvious determinant of F is the per capita gain promised by the policy. If the per capita gain is low, as in the Getty expropriation, F will be low also; as the per capita gain increases, so will F .

Thus it appears that F would rise sharply only when a proposed policy moves toward expropriating the wealthiest 49 per cent for the benefit of the poorest 51 per cent. It requires at least 51 per cent support for a policy to dominate, and maximizing the loot with which to buy the favor of beneficiaries requires taxing the rich to pay the poor. While I will immediately consider some forces—the costs of redistribution—that will eliminate this sort of discontinuity, the reader should be forewarned that the Robin Hood feature of this and similar models¹⁶ will be retained. In this stylized demo-

¹⁶ For example, Thomas Romer, *Individual Welfare, Majority Voting, and the Properties of a Linear Income Tax*, 4 J. Pub. Econ. 163 (1975); Robert Aumann & Mordechai Kurz, *Power and*

cratic process, the rich are taxed to keep down the numerical opposition to redistribution.

The costs of redistribution will limit the appeal of the massive, 49-paying-51, type of redistribution. The costs I focus on are those imposed on private markets by redistribution, rather than, say, the direct costs of running government programs. The *P*'s and *Q*'s deal with each other in goods, labor, and capital markets, so a tax on the *Q* also decreases the private income of the *P*. For example, if the *Q* are major suppliers of capital, a tax on their wealth will discourage saving and so lead to a reduction in the demand for the *P*'s labor services. Thus, any redistribution policy short of pure lump-sum taxes is a mixed blessing for the *P*; they gain directly but at an indirect cost to their private wealth. This requires two amendments to our story. First, the tax rate levied on the *Q* to finance any redistributive policy is a political "bad"; the higher it is, *ceteris paribus*, the less attractive the policy is to the *P*'s. Thus, extreme Robin Hoodism (tax rate = 1) is not likely to be politically dominant. In fact, it can easily impose net losses on many or most of the *P*'s.

The second amendment to the story is more technical but helps motivate the subsequent formalism. Specifically, I argue for the Marshallian mistrust of discontinuities: *F*, the fraction of *P* who view a policy as "best," will not suddenly leap from -1 to +1 for some critical change in policy. The *P*'s are never unanimous about a particular policy, because the importance of private-market links to the *Q*'s will vary among *P*'s. To illustrate, consider a proposed redistributive policy consisting of a per *P* transfer, *g*, financed by tax rate *R*, on *Q* taxpayers. Now compare this to a proposal for more redistribution, and trace out the effects of the change on *F*. One possible new proposal is to raise both *g* and *R*. Given the varying negative effects of *R* on the *P*, some will favor the new proposal, others the old one; *F* may rise or fall, but is unlikely to go to a corner. Or the proposal might be to raise *g* but not *R*. The only way to do this without violating the irrelevance-of-pie-in-the-sky rule is to raise *Q*. But this also adversely affects *P*'s generally, some more than others. So some will prefer the old policy, others the new. About all we can say at this level of analysis is that, if the old policy involved little redistribution, *F* (new policy) is more likely to be higher than if there is already much redistribution (and hence much deadweight loss).

The different responses among the *P* to any program play a crucial role in the theory. To elaborate, let us first recapitulate the discussion so far:

1. A politically dominant redistributive policy maximizes

$$M = P \cdot F - \text{numerical opposition}, \quad (1)$$

Taxes, 45 *Econometrica* 1137 (1977); and Alan Meltzer & Scott Richard, *The Growth of Government* (1979) (mimeographed paper at Carnegie-Mellon Univ., Econ. Dep't).

where

P = number of beneficiaries of the policy

F = fraction of P who prefer this policy over all others.

2. F depends on at least two parameters of the policy; the payment per $P(g)$ and the tax rate levied to raise the funds (R):

$$F = F(g, R) \quad (2)$$

$$F_g > 0, F_R < 0.$$

3. Beyond some point, F_g can be < 0 , and in general, $F_{gg} < 0$. The reason, to repeat, is that if g is increased, *given* R , more people are being taxed. This is a "bad" for the P which can more than offset the direct benefit of the increased g for at least some of them. Moreover, pushed far enough, proposals to increase g will become too risky for politicians to support even if the proposals would benefit P 's on balance. Since such proposals involve adding hostile taxpayers, the politician advocating them increases his risk of losing an election. He or his constituents may prefer to cast their lot with a more modest proposal.

I have argued that any proposal for a dominant policy will involve taxing the rich to benefit the poor. This is because any g can be raised this way at the smallest cost in terms of numerical opposition and at the smallest R for a given numerical opposition. I now want to argue that the income of beneficiaries is also relevant to the likely success of a proposal. One reason for this may be diminishing marginal utility of income, so that the perceived benefits of any g are smaller the higher the private incomes of beneficiaries. But I focus here on the deadweight losses of redistribution borne by the P . These losses are likely to increase with income, at least in absolute dollar terms. Consider, for example, a general reduction in the demand for labor as a result of an increase in R . Surely the dollar loss will be higher the higher the pretax labor income of a P . If the tax discourages nonhuman capital formation, the relative loss to higher income P 's will also be greater. If their high income is partly a return on human capital, the rise in the human/nonhuman capital ratio lowers the rate of return to human capital. Those P with a trivial human-capital investment can escape this cost. Put briefly, a P with trivial private income has little at stake in private dealings with the Q and is therefore less resistant to a large tax than a P with substantial income.

This hypothesis requires two further amendments:

1. Equation (2) needs to be expanded to

$$F = F(g, R, Y), F_Y < 0, \quad (3)$$

where Y = per capita income of the P . This says that if Y falls, it has the same effect as if R falls or g rises—it improves the net benefits of any redistributive policy and hence the likelihood of the policy becoming politically dominant.

2. The complement of "tax the richest" is "benefit the poorest." By our logic, if we had to pick 100 individuals from whom to raise any given total tax, they would always be the richest 100. This would minimize R , implying that any proposal to expand the number taxed means adding less wealthy individuals to Q . Similarly, if 100 individuals are to be benefited, they should be the poorest 100. They will bear the lowest indirect cost of the associated tax and so be the least ambivalent about supporting it. The implication is that Y , the per capita income of the P , is endogenous to the policy: if you propose to increase P , you are proposing to increase Y , because the new members will have higher income than the average of the 100 poorest. So

$$Y = Y(P), Y_P > 0. \quad (4)$$

To conclude the analysis, we need to elaborate on the opposition to redistribution from those taxed, the Q 's. They face a choice complementary to that of the P 's, but simpler: all redistributive policies are bad for the Q 's, but some are worse than others. Thus, the degree of opposition from the Q 's to any proposed policy will depend on how much the policy would hurt them if adopted *and* how much worse or better off they might be under alternative policies. A simple general statement about the numerical opposition (ϕ) to a proposed policy would be

$$\phi = Q(1 - E), \quad (5)$$

where E = the fraction of the Q who tolerate (that is, do not oppose) the policy. In principle, E could range from zero (the policy is so harmful that no alternative is likely to be worse and all Q 's oppose it) to +2 (the policy is so mild that *any* alternative is likely to be worse, so all the Q 's actually favor it). In practice, we ought to be concerned only about policies for which $0 < E < 1$, since no politician is likely to count on the support of those he proposes to tax as his path to victory. Generally, we expect

$$E = E(R), E_R < 0. \quad (6)$$

That is, the higher the proposed tax rate, the larger the proportion of Q 's who will conclude that an alternative will be no worse and therefore oppose the proposal.

I now summarize the discussion by rewriting (1) in a modified form, which makes subsequent manipulation more tractable by avoiding inessential complexity. First, express (1) in exponential form

$$M = e^{P+F} - e^{Q-E}. \quad (7)$$

All symbols, except M , are now and henceforth to be understood as natural logs. For example, " P " is now $\ln P$, " E " is a transformation of $\ln(1 - E)$, and so on. In doing this, we implicitly focus on policies that the P 's support and the Q 's oppose. That is, the new F is bounded by $[-\infty, 0]$ and the new E by $[0, \infty]$. In the new notation $E = \infty$ means "none of the Q 's oppose the policy," so opposition is $e^{-\infty} = 0$; $E = 0$ means "all the Q 's oppose the policy." Next, I write

$$F = F(g, R), \quad (8)$$

where $g = G - J$,

$G = (\log \text{ of })$ total government expenditures and taxes (recall that we are assuming all expenditures to be on redistribution),

$J = (\log \text{ of })$ total private income of the P 's,

$R = G - I$, the log of the tax rate on Q 's total income (I).

In (8), I have simplified (3) to make the critical benefits variable depend on the ratio of the direct transfer to private income rather than on the two separately. This expresses the crucial notion that transfers lose appeal to the P 's the higher their private incomes.¹⁷ The discussion leading to (4) implies: $J_P > 1$ (J is determined by P , and the "marginal" P is richer than the average), and $I_Q < 1$ (the "richest-first" tax policy implies that the "marginal" Q is poorer than the average). Finally, with the new notation understood, (6) is left unchanged.

The formal problem emerging from the theory is to find the redistributive policy that maximizes (7) and toward which political platforms will converge, a policy described by specific values of P , Q , and G , and subject to the constraint that benefits equal taxes.¹⁸ The first-order conditions for the solution to this problem ($M_P = M_Q = M_G = 0$) yield the following marginal "revenue-cost" equalities (the gain is on the left-hand side):

$$1 = F_g J_P. \quad (9)$$

This says that the dominant platform pushes P until the direct gain (always a

¹⁷ The simplification costs some detail. The theory implies that a simultaneous increase in G and J can, beyond some point, decrease support. This is because, given R , the increase in G increases Q , which is a "bad" for the P 's.

¹⁸ Another possible constraint would be something like total voters = beneficiaries + taxed. The motivation for not introducing the constraint is more descriptive than substantive. The subsequent analytical results would hold under such a constraint. However, tax and spending policy are typically kept separate both in political platforms and practice, resulting in a large group which receives substantial benefits and pays large taxes. In terms of the formal model, one can regard a member of this group as facing two decisions—one in the role of a P another as a Q —to which equations like (8) and (6) apply separately.

1 per cent increase in supporters) is balanced by the added cost, which comes from diluting benefits over a wider and wealthier base of beneficiaries.

$$-I_Q[e^{P+F+E-Q} \cdot F_R + E_R] = 1. \quad (10)$$

In (10) the gain from expanding Q by 1 per cent is indirect; the tax base is expanded and permits a lower R , which is valued by both P 's and Q 's ($F_R, E_R < 0$). The cost is the 1 per cent expansion of numerical opposition.

$$F_G = -[e^{Q-E-P-F} \cdot F_R + E_R]. \quad (11)$$

Here the gain from expanding G is that a larger proportion of P 's will support the policy ($F_G > 0$); the cost is that both P 's and Q 's do not like the resulting higher taxes.¹⁹

There are two second-order conditions minimally required for (9)-(11) to describe an interior maximum: diminishing returns to benefits and increasing costs to taxation. I have already discussed the economic rationale behind the former ($F_{GG} < 0$).²⁰ There is also a mechanical rationale; since F cannot be greater than zero (in logs), beyond some point F_G must diminish. With respect to increasing costs, we have a choice: either $E_{RR} < 0$ or $F_{RR} < 0$. Since E has a finite lower bound, it is more convenient to assume $F_{RR} < 0$. This says that a given tax increase leads the Q 's to withdraw more wealth from market exchange with the P 's at higher than at lower tax rates. There is no strong economic reason for the deadweight losses to accelerate in this manner. However, if they did not, the model would permit completely confiscatory taxes. To make the subsequent results clear, I do not go beyond these minimal second-derivative conditions.

¹⁹ A more general version of (9)-(11) would begin from something like

$$F = (g', L),$$

where $g' = G - P$ (that is, the per capita benefit instead of the benefit-income ratio)
 $L = \text{loss to } P \text{ from taxation} = L(Y, R, I).$

This L -function summarizes the P 's private interest in trading with the Q ; this would be related to the P 's private income (Y) as well as R and I (the tax base). Presumably, the same R on a larger base is worse for the P 's private welfare. My more tractable specialization already has $F_Y < 0$ implicitly and $F_R < 0$ explicitly, but does not embody a potential offset to the gain in expanding Q (left-hand side of (10)): When Q is expanded it raises I ($I_Q > 0$) as well as reducing R ; the former is "bad" for the P , the latter "good." Allowing the ambiguity, (10) would be

$$-I_Q[e^{P+F+E-Q}(F_R - F_I) + E_R] = 1.$$

Note, however, from (9) that $F_G < 1$ ($J_P > 1$) and, consequently, from (11) that $-E_R < 1$. So the term $(F_R - F_I)$ must be < 0 , to satisfy (10) in spite of $F_I < 0$. In my specialization I assure this by setting $F_I = 0$. All this says is that there has to be some marginal gain for the P from expanding Q to offset the hostility of the Q 's. Given this logical necessity, the specialization $F_I = 0$ is only a simplifying detail.

²⁰ Note that, while this is required for an interior maximum, diminishing returns in logs is not necessarily implied by diminishing returns in natural numbers for this variable.

We can now proceed to derive formally the effects of income distribution characteristics on the equilibrium size of government. First I introduce a variable (X) into the two cumulative income functions ($J(P)$, $I(Q)$) which changes them exogenously in some prescribed way. Then I derive the total effect of this shift on G (that is, dG/dX) from the general relationship

$$[di/dX] = -[M_{ix}][M_{ij}]^{-1}, \quad (12)$$

where $i, j = P, Q, G$,

$[di/dX]$ = vector of total derivatives,

$[M_{ix}]$ = vector of cross-partial derivative with respect to X ,

$[M_{ij}]^{-1}$ = inverse of the matrix of cross-partials.

Consider first an exogenous event that increases every member of P 's income by 1 per cent while reducing every Q 's income by 1 per cent so $J_X = -I_X = +1$, while $J_{PX} = I_{QX} = 0$. This yields the following sign condition:

$$\text{sgn } dG/dX = \text{sgn } F_{gg}[1 + I_Q F_g] < 0. \quad (13)$$

This is the "Robin Hood" result: as the poor P 's get wealthier, the political forces for redistribution weaken. The now wealthier P 's have a larger stake in private transactions with the Q 's and are therefore less anxious to see the latter's wealth taxed. $J_X > 0$ implies $g_X < 0$; and this lower g reduces support for redistribution, since $F_g > 0$. In effect, the private-market redistribution has substituted for part of the task of the political market.

Now consider what happens when inequality is reduced *within* the beneficiary group, while between-group inequality remains the same. To stylize this event, let the two groups' total incomes remain unchanged ($I_X = J_X = 0$), but let the marginal (wealthiest) beneficiary's income decline, or, more generally, the slope of the cumulative income function decline ($J_{PX} < 0$). Application of (12) yields

$$\text{sgn } dG/dX = \text{sgn } \frac{-[F_{RR}I_Q + F_R(1 + E_R I_Q + F_R I_Q)]}{[1 - I_Q F_g]}. \quad (14)$$

Both numerator and denominator are positive, so the right-hand side of (14) is also positive.²¹ The former reflects the political costs of taxation and the latter the gains of spending, so (14) is telling us that both are altered in a way favorable to *more* spending when inequality among beneficiaries is *reduced*.

Since this result is important for the empirical work, it deserves some

²¹ Both F_{RR} and $F_R < 0$. The parenthetical expression in the numerator > 0 in equilibrium (see equation (10) and note that $e^{P+R-(Q+E)}$ must > 1 for an interior solution). Since $F_g < 1$ by (9) and $I_Q < 1$, the denominator must be > 0 .

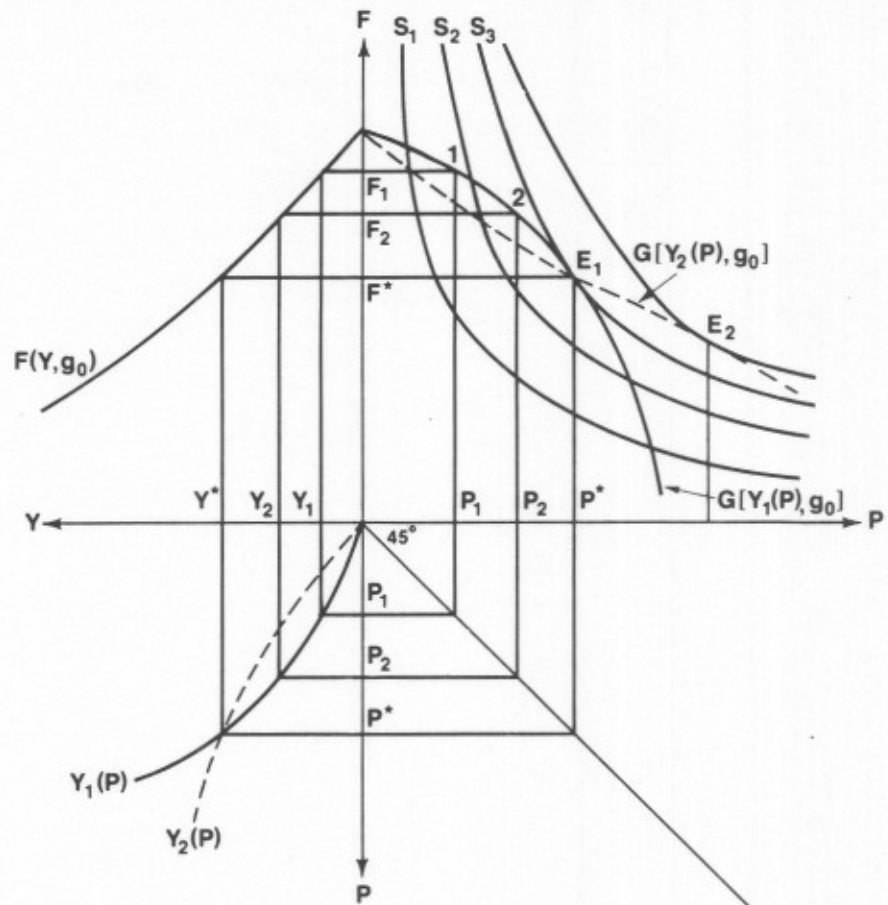


FIGURE I

elaboration. A key element of the result is displayed in Figure I, where I have had to suppress parts of the general solution for the sake of exposition, and where, for a similar reason, I temporarily suspend the log notation. Specifically, suppose the per capita transfer to the P 's is fixed (at g_0). The political decision in this restricted version of the general problem is the number of P 's who will get g_0 , so total transfers will be proportional to this number. Recall our crucial assumption that the higher the per capita income of the P 's, the less avid their support for any particular redistributive policy. This is shown as $F[Y, g_0]$ in quadrant II of Figure I: given g_0 , a smaller fraction (F) of P 's will support a policy that gives each of them g_0 the higher their average income. Recall also that, since high income dulls the appetite

for redistribution, any P chosen will be the poorest P in the population. This enables us to express Y as a function of P as displayed by $Y_1(P)$ in quadrant III. If $P = 1$, Y is the income of the poorest person (0); if $P = 2$, Y is the average income of the two poorest, and so on. So $Y_1(P)$ describes the income distribution of P 's; as drawn it is meant to describe a relatively [to $Y_2(P)$, which we discuss later] unequal distribution. There are many poor P 's, so Y does not increase much if we propose adding P 's to a modest set of beneficiaries. However, if we go further and try to add middle class P 's, Y starts increasing sharply, for they are much richer than the poor.

These two functions would, except for one difficulty, enable a politician to answer the question: if I proposed giving g_0 to each of P_0 , what fraction of them would find this the most preferred policy? The difficulty is that higher levels of P_0 imply higher taxes and/or more people taxed, which, we have argued, are "bads" for P 's as well as Q 's. One inelegant way around this problem is to imagine that all of the negative effects of taxation are incorporated into the negatively sloped $F(Y, g_0)$ function. That is, the politician says something like: if I widen P , there are more potential votes for redistribution, but I necessarily raise Y and increase R and/or Q . All of the latter three effects will offset some or all of the potential political gain from widening P . The crucial notion is simply that there is a trade-off between *increasing* P and *reducing* the fraction of the electorate that supports or tolerates redistribution. For expositional purposes, I will ignore parts of this trade-off—the increased opposition and tax effects—and focus on P -income distribution effects.

All of the above understood, the relevant trade-off available in the political market is $G[Y_1(P), g_0]$ in quadrant I, which shows that if a policy proposes a larger set of P a smaller fraction will support it. It is constructed as follows. Suppose benefits are limited to P_1 people. They will have an average income of Y_1 , which I find by (i) locating P_1 on the vertical axis of quadrant III by means of a 45-degree line and then (ii) reading off from $Y_1(P)$. For $Y = Y_1$, I can determine F_1 from $F(Y, g_0)$ in quadrant II. The resulting combination (P_1, F_1) , labeled (1), is one point on this political "transformation" locus, $G[Y_1(P), g_0]$. In a similar fashion, point (2) is generated, starting with P assumed = P_2 , and the locus of all such points is $G[Y_1(P), g_0]$.

The political objective to be sought in a choice of P is maximum numerical support (again read "support" as "support net of all opposition"). Support is simply the product PF . In quadrant I of Figure I, this objective is characterized by a series of rectangular hyperbolae (S_i), each of which collect the P , F combinations consistent with a given support (S_i). The dominant policy is characterized by (P^*, F^*) , or point E , where S is maximized, given $G[Y_1]$.

Imagine the sort of exogenous event that occurs in (14). The average

income of the P^* , $Y(P^*)$ is unchanged, but it is more equally distributed among them as represented by the new income function, $Y_2(P)$, in quadrant III. It crosses $Y_1(P)$ at P^* and is flatter at P^* and steeper near the origin. Poor marginal beneficiaries now add more and rich marginal beneficiaries less to the average income of the group. This, in turn, implies a new $G[\cdot]$ which cuts the old one from below at the old equilibrium E_1 . The dominant policy is now E_2 which implies a higher P^* and, given g_0 , a higher level of government spending.

To understand what is involved here, recall why P^* was an equilibrium when $Y_1(P)$ prevailed. There was a positive probability that the $P^* + 1$ st beneficiary would himself favor extra redistribution. But this small expected gain was insufficient to overcome the adverse effects of the added taxes on the remaining P^* . The gain was small because $P^* + 1$ is so wealthy that he bears a heavy indirect cost of the added taxes required to pay him g_0 . Now $P^* + 1$ is less wealthy and would bear correspondingly smaller losses to his private wealth if taxes are raised. He is thus more likely to return the favor if a politician proposes to include him among the beneficiaries. Rational politicians will respond by proposing to expand the set of beneficiaries.

The principle that more similar interests in redistribution broaden the support for it could be extended to the direct costs of redistribution, which the formal model ignores. If more diverse interests imply a greater variety of programs (transfers for the poor, state opera for the rich) and each has its own "set-up" costs, the benefits perceived per dollar expenditure will be smaller than otherwise. If we permit benefits to be a fraction of total expenditures to reflect these government "brokerage" costs, it is straightforward to show that the equilibrium expenditure rises as the brokerage costs fall. A corollary to this is that governments will not want to completely offset the effects of divergent within-beneficiary-group interests with different per capita transfers. Equalization of benefit/income ratios among beneficiaries, for example, would be too costly, since it would entail complete exclusion of the poorer beneficiaries from access to some programs. Moreover, even if equalization were feasible, our model implies that an optimal policy redistributes wealth *within* as well as *between* groups.²² This also has a corollary:

²² This is seen most easily in the following restricted problem (log notation again suppressed): A given G is to be distributed among two equal-sized (\bar{P}) groups of beneficiaries, who differ only in their incomes (J), to maximize the political support (S) forthcoming from the two groups. Thus, the objective is to maximize

$$S = \bar{P}[F(g_1) + F(g_2)],$$

where F has the same meaning as before and

$$g_i = G_i/J_i, \quad i = 1, 2.$$

the total support produced by any given redistribution is enhanced if the pretransfer income differences among beneficiaries narrow.²³ So while we have, for simplicity, ignored problems connected with the distribution of benefits, their resolution reinforces the previous result that homogeneity among potential beneficiaries increases the demand for redistribution.

In any event, the model suggests a distinction between two types of inequality, that *between* beneficiaries and taxpayers and that *within* the former group. It also suggests that a reduction in within-beneficiary-group inequality stimulates the growth of government, whereas reduced inequality between groups retards it. Thus no straightforward connection is implied between any overall measure of income inequality and the size of government. As we shall see, there are formidable empirical problems in disentangling the two types of inequality from the available data.

B. Costly Information

Learning about the effects of a proposed policy or candidate is not, of course, costless, as we have been assuming it to be. There will also be costs of organizing groups to support or oppose adoption of a policy. These costs of access to the political mechanism mean that some voters will be ignorant of the effects of a policy. This section discusses the effects of ignorance on the results just derived.

I will continue to assume that all members of Q are fully informed. This simplification is intended to capture a qualitative difference between them and members of P rather than for descriptive accuracy. Any dominant policy will have to keep Q smaller than P , so Q members will have the larger per capita incentive to become informed about the effects of a policy and organize their interests. Therefore, incomplete knowledge should have the strongest impact on the behavior of group P . To get at this differential impact of ignorance, I confine the analytical burden of ignorance to the P group.

Since $G = G_1 + G_2$, this reduces to selecting the optimum G_1 . The solution is to select G_1 such that

$$\frac{F_{g_1}}{F_{g_2}} = \frac{J_1}{J_2}.$$

If group 1 is poorer, this ($J_1/J_2 < 1$) and diminishing returns imply $g_1 > g_2$ —i.e., the poorer receive higher transfers relative to income.

²³ To stylize this, let $J_{1,x} = -J_{2,x} = +1$, and note that

$$\frac{ds}{dx} = \frac{dg_1}{dx} (F_{g_1} - F_{g_2}).$$

Since group 1 is now richer, the optimal response is to reduce g_1 . Since $F_{g_1} < F_{g_2}$ in equilibrium, $ds/dx > 0$. So the narrowing of within-group inequality enhances the political payoff to the total transfer expenditure.

I allow for two effects of ignorance. The *direct* effect is simply that only a fraction of the P who would support a policy if all were informed ($P + F$, in logs) will actually know enough to do so. The ignorant remainder either "stay home" or vote randomly. The *secondary* effect is that politicians will try to exclude some of the ignorant from benefits, so as to concentrate benefits on those most likely to reciprocate. To get both effects, I expand (8) as follows

$$F = H(g, R, Z). \quad (15)$$

The added variable, Z , is an "exclusion" parameter, which varies between (0, 1) in natural numbers or $(-\infty, 0)$ in logs. The variable P is now to be interpreted as the maximum number of beneficiaries, that is, the number who would share G under "free" information. If Z is at its lower bound (no exclusion), the "free-information" case obtains: all the P are informed and share in G . An increase in Z represents more ignorance, which means a smaller fraction of the P support a policy and a smaller fraction are rewarded. If Z ever attained its upper bound (total ignorance), $e^F = 0$ and no redistribution policy would be politically viable.

The indirect (concentrated-benefits) effect of ignorance can be expressed as follows. Retain the definition of $g = G - J$, but redefine J to be the total income of those actually receiving benefits. So

$$\begin{aligned} J &= J(P, Z) \\ J_Z &< 0. \end{aligned} \quad (16)$$

That is, the more P excluded, the lower the total income of *actual* beneficiaries. For simplicity, assume that those excluded are a random selection of the P 's, $J_Z = -1$ (Z in logs); that is, if 1 per cent of the P are randomly excluded, those left have 1 per cent less total income.²⁴

If we now combine the indirect with the direct effect of exclusion and examine the overall consequences of increasing the exclusion of P 's from benefits, we get for the effects of exclusion

$$F_Z = H_Z + H_g \cdot g_Z = H_Z + H_g \quad (\text{since } g_Z = -J_Z = +1). \quad (17)$$

The second right-hand side term is the indirect effect of exclusion which states that the more concentrated benefits improve support for any given total expenditure. The H_Z term will be the resultant of two opposing forces. On the one hand, there are fewer potential supporters, since a subset of the P

²⁴ More plausibly $-1 < J_Z < 0$. This would hold if those excluded tend to be a poorer than average subset of the P 's, which is what would be implied by the positive correlation between income and likely indicators of the ability to process political information (education).

A counterforce is that high income implies high time costs of acquiring information. The optimal included beneficiary is poor and well-educated.

receives no benefits. This would imply $H_Z = -1$. On the other hand, the remaining beneficiaries are of higher "quality"—that is, more responsive to any benefits, and this implies $H_Z > 0$. Presumably, a rational selection process of excluding the dumbest first will imply diminishing "quality" effects with exclusion, so $H_{ZZ} < 0$. We also know that beyond some point $H_Z < 0$ on balance, since total exclusion implies $e^F = 0$.

As it happens, a first-order condition for the expanded policy choice problem (which now requires selecting Z as well as P , Q , G) is

$$H_\theta = -H_Z. \quad (18)$$

So $H_Z < 0$ in equilibrium. Exclusion is pushed until its direct effects are negative at the margin and counterbalanced by the favorable effects of concentrated benefits. The remaining first-order conditions carry over intact from the free-information case ((9)-(11)). As a result, the effects of income-distribution changes on the growth of government are the same in both models. The added insight we gain into the size of government concerns changes in the "ability" or quality of voters. The effects of some manifestations of such change can be summarized as follows:

1. An exogenous increase in the average "ability" of the P 's ($H_X > 0$ at any Z) increases the equilibrium G .

2. There is no ability counterpart to the within-group income equality effect. Specifically, suppose those individuals at the margin of exclusion suddenly become more able, while average ability is the same. Thus, the difference in ability between the most and least able beneficiary narrows ($H_{ZX} < 0$, $H_X = 0$). This generates two conflicting forces which exactly offset each other: (i) the degree of exclusion is reduced, but (ii) the maximum set of beneficiaries (P) is contracted. This latter occurs to mitigate the otherwise adverse tax and benefit-dilution effects from a net addition of beneficiaries.

3. Similarly, an exogenous increase in the ability of P 's to translate marginal changes in g into political support ($H_{gX} > 0$, while $H_X = 0$) has no effect on G . The temptation to expand P is countered by the negative consequences of higher taxes, which lead to increased exclusion.

In short, G will vary directly with average ability of beneficiaries, but only its distribution among beneficiaries is altered by changes in the distribution of ability. If income and "ability" are positively related, it would no longer necessarily follow that the poorest citizens would be prime beneficiaries of redistribution. But the corollary (2, above) to this version of "Director's Law" is that, if the poorest become *relatively more* able, the middle class will lose some of its benefits.

The main theoretical results whose empirical content is the subject of the next section can now be summarized.

1. If potential beneficiaries' incomes increase relative to those of taxpayers, G will fall.

2. But if there is a similar increased equality of the ability of the two groups to recognize their interests, G will increase.

3. Anything which increases the efficiency of G in "buying" support can be put under the "ability" rubric. Thus lower costs of collecting taxes, or of transforming them into benefits, increases the gross G .

4. More equal income among beneficiaries increases G , but more equal ability has no effect.

V. EMPIRICAL ANALYSIS

The theory shows how some "pregovernment" distribution of income and ability affects the politically optimal level of government spending. Since no such pristine distributions will ever be found in the world, any attempt to relate empirically the size of government to an actual distribution entails a classic "identification" problem; the distribution can both affect the size of government and be affected by it. Moreover, we would not want to abstract entirely from this feedback effect, even if we could. For example, suppose a progressive income tax is levied and the proceeds are shipped abroad or used to pay for public goods that everyone agrees ought to be bought. Now we want to predict the size of redistributive government spending, the main choice variable in our model. My argument that the stake of potential beneficiaries in private dealings affects optimal redistribution implies that *after-tax* income and its distribution are the relevant variables. On the other hand, it could be argued that the progressive tax is the outcome, not a contributing cause, of the optimal policy. Transfer incomes would seem even more clearly an outcome of the process. But that does not imply that, for example, pretransfer income is the appropriate proxy for the "private" income in our model. Someone with only transfer income might have substituted private income absent the transfer. Government affects the distribution of earned income before as well as after taxes. But how? Presumably progressive taxes lead to more pretax inequality, but egalitarian social policies could offset this, by directly or indirectly shifting demand toward lower wage labor. This listing of the potential crosscurrents in government's effect on any empirical distribution of income or ability could be extended.

I deal with the lack of any real-world counterpart to the theoretical "state-of-nature" distributions in two ways. First, I ignore the complications and use what is available, assuming implicitly that the crosscurrents cancel each other. I focus mainly on income concepts (for example, earned income) where some of the direct effects of government (transfers) are absent, but ultimately there is no obvious income concept that is more nearly "right" for our purposes.²⁵ Second, I focus on the growth as well as the level of govern-

²⁵ Simultaneous equation techniques might appear to offer a way out. But with government

ment spending, assuming a lagged adjustment to any target level of G . In this framework, one can explicitly control for the current actual level of G and implicitly for any effects on other determinants of the target G . To elaborate, consider this version of a familiar lagged adjustment model:

$$\Delta G = a(G^* - G), \quad (19)$$

where $*$ = target value and a = fractional adjustment coefficient; and

$$G^* = bX, \quad (20)$$

where b = vector of constants and X = vector of variables determining G^* . For simplicity, assume only one determinant of G^* , say a summary measure of income inequality. However, the measure ought to be one that would prevail in the absence of at least some effects of the current G , and we cannot observe this directly. Instead, we observe Y , which, for simplicity, can be expressed

$$Y = X + cG, \quad (21)$$

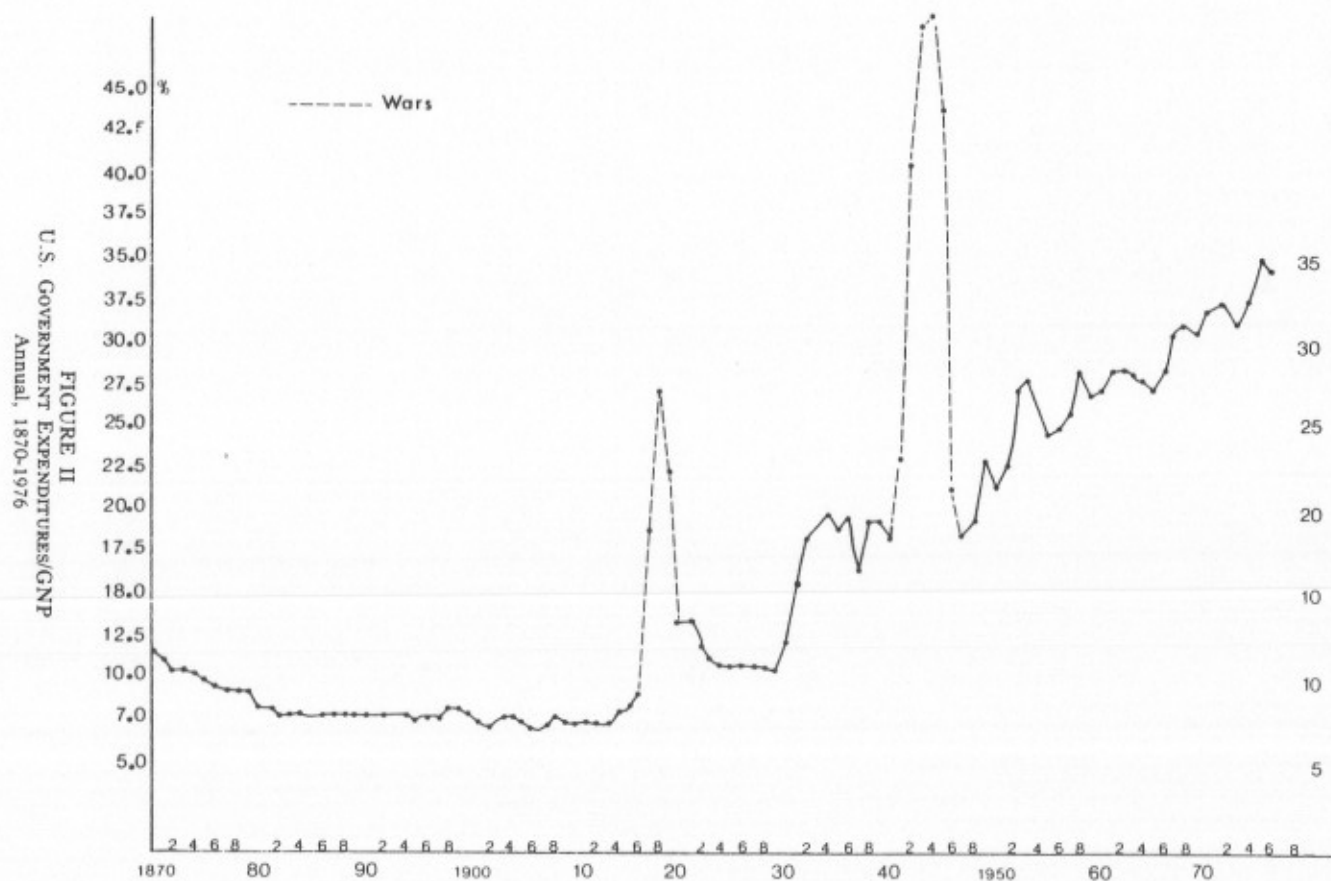
where c = coefficient (we do not know its sign). Substituting (21) into (20) and (20) into (19), we get

$$\Delta G = abY - a(1 + bc)G. \quad (22)$$

Here the coefficient of G amalgamates the usual partial adjustment effect, a , and the influence of G on the observed measure of income inequality, c . Empirical implementation of (22) thus entails all the econometric problems of partial adjustment models plus that of collinearity between Y and G (if $c \neq 0$).

The model and the preceding discussion of the empirical literature imply that the target level of G or of the G /income ratio is affected by at least three characteristics: between- and within-group income inequality and some average level of "ability." The available data do not always permit anything like this level of detail. Frequently, nothing more than a crude proxy for overall income equality is available, and the model makes clear that this variable has ambiguous effects on G^* . The initial empirical work is an attempt to see if any of the conflicting forces embedded in an overall equality measure dominate; the refinements are dealt with subsequently. To compensate partly for the crudity of the data, I will examine a few distinct sets of data to see if they yield a consistent story. These include British, American, Canadian, and Japanese time series and cross sections of developed countries, U.S. state and local governments, and less developed countries. Most

spending 40% of GNP and regulating much of the remainder, specifying "exogenous" determinants of, say, the distribution of income involves as much risk as assuming that the distribution is itself exogenous.



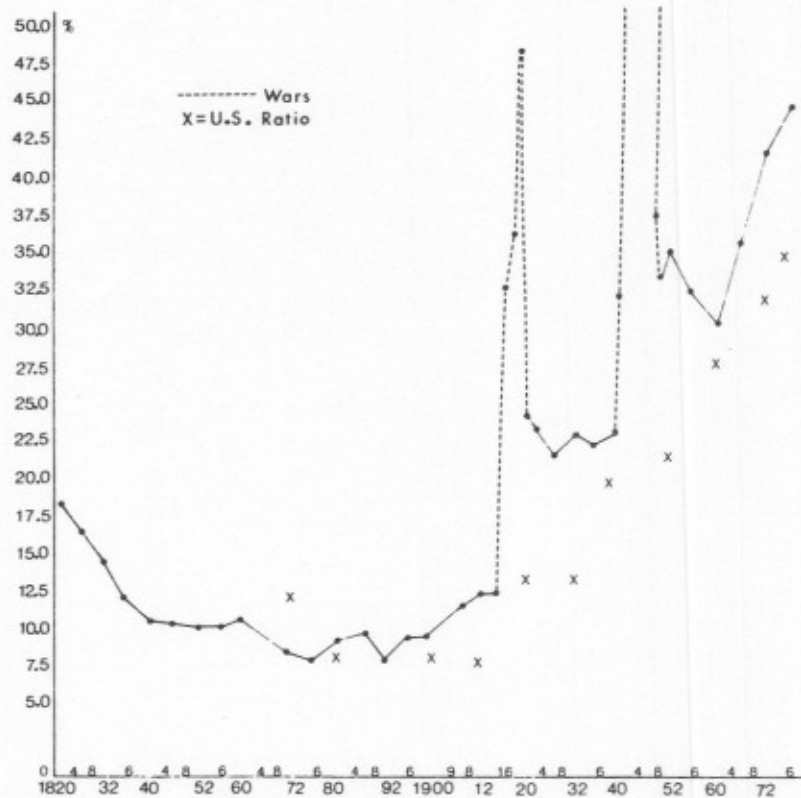


FIGURE III
BRITISH GOVERNMENT SPENDING/GNP
Five-Year Intervals, 1829-1974

of these data imply that income inequality, on balance, retards growth of government. We shall see, however, that this connection is more complex than just stated.

A. Time Series

1. *Britain and the United States.* The historical patterns we seek to explain were described broadly in Section I. In light of our review of the empirical public-goods literature, I focus on the government budget share of GNP as shown in detail in Figures II and III for the United States and Britain. The history of government's share of GNP is similar for both countries: decline or stability in the nineteenth century and growth in the twentieth. The most notable differences between the two countries seem to be: (1) the earlier completion of the British nineteenth-century decline, (2) the larger

ratcheting effect of the two world wars for Britain, (3) the substantial U.S. growth in the 1930s versus none for Britain, and (4) the sharper recent growth for Britain.

Is there some plausible connection between this history and income inequality? In asking this, I ignore for now a host of potential complicating factors such as, for example, the extent of the franchise and changes in political structure. This leaves a major empirical problem of devising a proxy for income equality that can be matched to the data. Nothing like the standard size distributions is available for most of the period covered by the data, although Kuznets has conjectured they would show inequality following a path opposite to that in Figures II and III, with inequality first widening then narrowing in consequence of the gradual shift of resources from the low-income agricultural sector.²⁶

The only inequality-related data of which I am aware that are useful for a long time series concern intra-industry wage dispersion, specifically skill differentials (the ratio of wage rates of skilled to unskilled labor). In a way, this crude measure is better for our purposes than an overall inequality measure, because it should be more closely connected to inequality within the beneficiary group. More recent data, however, imply that it may be difficult to make the sort of distinctions about inequality required by the model. Figure IV illustrates the scattered data we have on U.S. skill differentials over the past 135 years. For the last 60, we also have a series of the share of national income going to the richest 5 per cent of the population. This is labeled "Kuznets," since the pre-1950 data are his.²⁷ Since 1915, the Kuznets series and the building industry skill differential (journeymen's wages divided by laborers' in union contracts)²⁸ have followed the same path

²⁶ Simon Kuznets, *Modern Economic Growth: Rate Structure and Spread* (1966). His argument in its simplest form is as follows. Suppose that there are no differences in income within either of the two sectors, but that the nonagricultural incomes are higher. Then the variance of logs (VL) of individual incomes (a standard inequality measure) in the community at a moment in time is

$$VL = a(1 - a)(A - N)^2,$$

where a = fraction of population in agriculture and A, N = log of agricultural and nonagricultural incomes, respectively. If A and N do not change, the change in VL over time is

$$d(VL)/dt = (A - N)^2(1 - 2a)da/dt.$$

Thus if a starts out high ($> 1/2$) and declines steadily ($da/dt < 0$), inequality at first rises, then falls (when $a < 1/2$). Kuznets's conjecture assumes that this effect dominates any offsetting changes in $(A - N)$ and within-sector income dispersion.

²⁷ Simon Kuznets, *Share of Upper Income Groups in Income and Savings* (Nat'l Bureau Econ. Research, 1953). Post-1950 data are for families—the two series are virtually identical where they overlap—from *Historical Statistics of the U.S.* and *Statistical Abstract*.

²⁸ From U.S. Bureau of the Census, *Historical Statistics of the U.S.* (1975) [hereinafter cited as *Historical Statistics*]; *id.*, *Statistical Abstract of the U.S.* (1978); and Harold F. Lydall, *The Structure of Earnings* (1968).

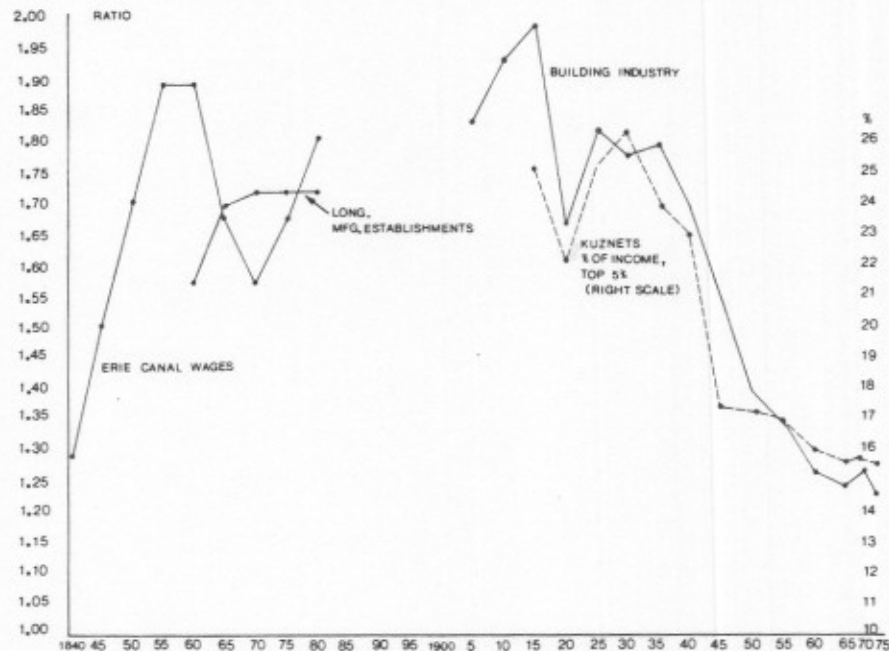


FIGURE IV
SKILL DIFFERENTIALS, UNITED STATES 1840-1975
AND INCOME SHARE, TOP 5 PER CENT, 1915-1975

(their correlation exceeds .8), even though they measure very different aspects of inequality. These data imply that the forces promoting equality have been pervasive.

The skimpy nineteenth-century American data are from Long's study of wages in manufacturing and Smith's study of Erie Canal wages.²⁹ The pattern emerging from all these data is one of increasing wage disparity over most of the nineteenth and early twentieth centuries and a long decline from World War I to the present. The two world wars, in particular, have coincided with profound movements toward equality, though some of the change of World War I was offset in the 1920s. These historical patterns are roughly the obverse of the secular path of government. They hint that, on balance

²⁹ Clarence Long, *Wages and Earnings in the United States, 1860-1900* (Nat'l Bureau of Econ. Research, 1960); and Walter Smith, *Wage Rates on the Erie Canal, 1828-1881*, 23 *J. Econ. Hist.* 298 (1963).

Interpolating over the 1885-1905 gap is likely to be as reasonable a procedure as any. For 1890-1900, we know that the ratio of building trades' wages (where skilled labor is important) to manufacturing wages rose.

and perhaps counter to intuition, income equality stimulates the growth of government. I pursue this hint shortly.

Another kind of inequality deserves mention here, namely, inequality across legislative constituencies. The theoretical discussion abstracts from the legislative mechanism through which conflicting individual interests are actually adjudicated. This is analytically convenient, but risks obscuring some aspects of political choice in a representative system. For one thing, legislators can specialize in collecting and communicating political information and thus a "full-information" model might adequately describe bargaining among legislators. More to the immediate point, bargaining would be more closely focused on the constituencies' average interests than on the interests of income groups who have members everywhere. The legislator will, of course, still have to worry about the disparity of interests within his constituency, but we ought to expect him, all else the same, to more easily ally with a legislator from a district with, for example, a similar average income. Thus, if greater personal income equality facilitates agreement on expanding the size of government, greater interdistrict equality ought to facilitate legislative agreement to implement the expansion.

Given the nature of the American political system at the national level, inequality of average incomes across states can serve as a proxy for the diversity of legislator interests. Figure V shows the relevant history for the available data,³⁰ which corresponds roughly to the pattern for skill differentials. But the narrowing of disparities began earlier (around 1890 versus 1915), was hardly affected by World War I, and was more profoundly affected by World War II. Also, unlike the relatively small changes in income equality after World War II, a substantial narrowing of interregional disparities continues to this day.

In the empirical work, I investigate whether this narrowing of interregional disparities has contributed to or retarded the growth of government.³¹ Any connection between the two ought, strictly speaking, to apply only at

³⁰ Sources of data are as follows: "Taxable Wealth" from U.S. Bureau of the Census, *Wealth, Debt, and Taxation* (1915). "Easterlin" from estimates by R. Easterlin of per capita personal income by census region relative to U.S. average as reported and updated in *Historical Statistics*, *supra* note 28. My calculation assigns each state its region's income relative. "Factory Workers' Earnings" from Paul F. Brissenden, *Earnings of Factory Workers* (U.S. Bureau of the Census, 1929). "Personal Income" from *Survey of Current Business* (various issues); 1920 figure is from Maurice Leven, *Income in the Various States* (Nat'l Bureau Econ. Research, 1925).

³¹ It is difficult to argue that growth of government is itself responsible for the narrowing, at least directly. For 1970, the coefficient of variation of private income per capita across states is about 18% versus 14.5% for all personal income. This difference is an exaggerated measure of the role of direct government payments, since it assumes that government workers, for example, would earn zero in the private sector. Yet 18% is still half the 1930 figure. Of course, past government activity—World War II—seems to have had a permanent effect on interregional inequality.

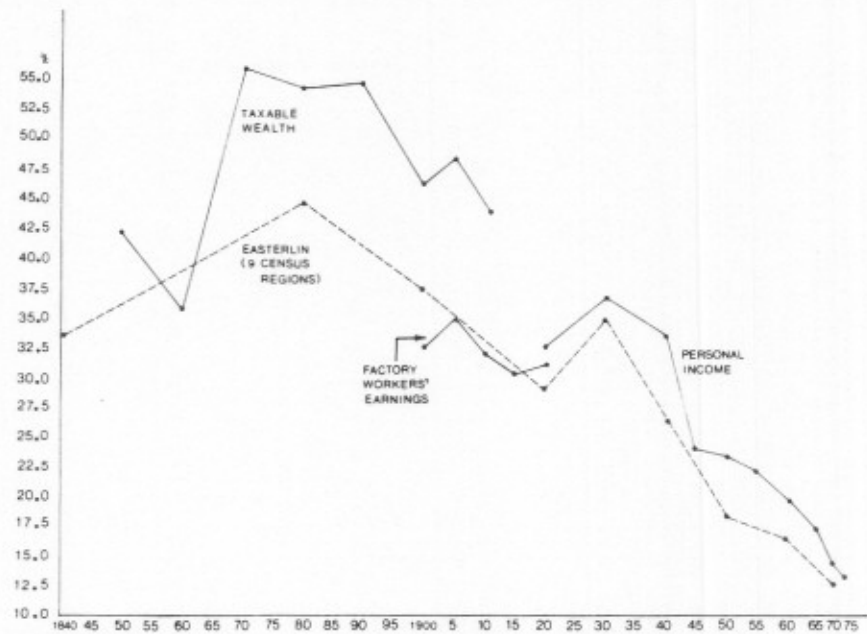


FIGURE V
COEFFICIENTS OF VARIATION PER CAPITA
INCOME OR WEALTH
STATES (UNITED STATES) 1840-1975

the federal level, unless disparities among regions within states have tended to follow the same path as interstate inequality.

Table 5 contains regressions of U.S. government expenditures relative to GNP on the two crude inequality measures just discussed. A trend variable is included as a proxy for "other forces" which may have produced secular growth of government. Clearly any comprehensive investigation would have to spell out these "other forces," and several are suggested by the theoretical model (for example, mean education, "between-group" inequality). However the limitations of the time series preclude anything more refined than Table 5. For example, a glance at Figure II indicates that our 105 annual observations are hardly independent. There are really two or three distinguishable episodes, with a few much less important subcycles. Consequently, I draw observations at five-year intervals, which yield only around twenty degrees of freedom, and even this may overstate the number of independent observations. In addition, the trend variable is itself a proxy for

TABLE 5
REGRESSIONS OF U.S. GOVERNMENT/GNP ON INEQUALITY MEASURES,
1870-1975 (5-Year Intervals, 22 Observations)

Regression	Coefficients (<i>t</i> -ratios) of				<i>R</i> ²	SE	D-W or H
	Skill Differential (1)	State Inequality (2)	Trend (3)	Lagged Government/GNP (4)			
(1)	-21.99 -5.33	.08 .42	.147 3.47		.943	2.28	1.09
(2)	-20.90 -6.67		.132 5.82		.942	2.23	1.01
(3)	-6.50 -1.51	.10 .81	1.07 3.24	.650 4.03	.979	1.48	-2.19
(4)	-5.20 -1.31		.088 3.74	.648 4.06	.978	1.46	-1.33
Mean	1.63	30.9		14.85			
SD	.23	9.0		7.92			

Notes: The dependent variable is government spending/GNP $\times 100$. See Figure II and text for sources. The time interval between observations is five years, and each value is a three-year average centered on 1870, 1875, To eliminate effects of wars, 1922 replaces 1920 and 1946 replaces 1945 in this sequence.

The skill differential is the series labeled "Long" in Figure IV for 1870-1980, the "Building Industry" series for 1905-1975, and a linear interpolation of the two for 1885-1900.

State inequality is the "personal income" coefficient of variation (see Figure V) for 1920-1975, the series labeled "factory workers' earnings" spliced to later data at 1920 for 1900-1915, and the series labeled "taxable wealth" spliced to later data at 1900-1910 for 1870-1995. Gaps in this series are eliminated by linear interpolation.

D-W and H are "Durbin-Watson" statistic and Durbin's H. The latter is calculated for regressions (3) and (4) where D-W is inappropriate. For (1) and (2) the D-W test implies positive serial correlation with about 5% risk of error. For (3) H implies negative autocorrelation with risk of $< 5\%$.

some aspects of inequality. The agricultural share of the labor force, for example, crossed 50 per cent at about our starting point of 1870. Thus, on Kuznets's argument,³² the subsequent further industrialization would have contributed to equality. Even the two inequality measures in Table 5 are hardly time independent. The correlations with time are $-.75$ and $-.93$ for the skill and state measures, respectively. Table 5 thus addresses a limited question: is there any plausible connection between inequality and the size of government?

The answer seems to be a qualified "yes." There is no perceptible effect from the narrowing of cross-state inequality, but in equations (1) and (2) there is a substantial and significant expansionary effect from the narrowing skill differential. To put this effect in perspective, note that from 1870 to 1975, the government/GNP ratio increased by around 23 percentage points, while the skill differential narrowed by about .5. Equation (2) assigns over

³² See note 26 *supra*.

40 per cent of this growth ($.5 \times$ the 20.9 coefficient = 10.45 percentage points) to the skill differential variable.

The link between inequality and government becomes more obscure, but does not disappear, when we allow for lagged adjustment and the possible effect of government on measured inequality. Equations (3) and (4) in the table are slightly modified versions of (22). The point estimates of the skill-differential effect remain substantial: if we assume no feedback effect ($c = 0$) in (22), then the implied derivative of the target government/GNP ratio with respect to the skill differential—which equals (coefficient of skill differential)/(1 - coefficient of lagged government/GNP)—is on the order of -15 to -20. Indeed, the derivative becomes still larger if we go to the other extreme. Suppose the growth of government is responsible for *all* of the .5 decline in the skill differential since 1870. Then, from (21) and (22), we can estimate c ($\approx -.02$), and the implied derivative (b) is about -30. However, given the relevant standard errors, we cannot attach much confidence to these calculations. They simply encourage examination of other data.

Figure VI shows the history of British skill differentials since the Napoleonic Wars, mainly for the same industry that dominates our U.S. data.³³ The major difference between the two countries seems to be the earlier peak in the British data, around 1850. Skill differentials in the United States do not clearly peak until World War I. Given the U.S. time-series results, this earlier reversal of the Industrial Revolution's trend toward inequality may help explain Britain's earlier completion of the nineteenth-century decline in the size of government. The twentieth-century pattern for skill differentials in the two countries is, however, broadly similar—a World War I downward jolt that was incompletely offset in the 1920s and a subsequent downward trend that only recently has flattened. As I point out later, this pattern is characteristic of much of the developed world in the twentieth century.

The British data, summarized in Table 6, show a stronger connection between equality and government than the American data. The effect is numerically larger, completely dominates "trend" effects, and remains significant in the lagged-adjustment formulation. It also holds up in first differences (regression (2)), which is motivated by the autocorrelation of the re-

³³ The "building industry" series is composed of the following: 1810-1880: weekly or hourly rates for bricklayers relative to helpers at London (or Manchester, if rates for London are unavailable) British Labour Statistics: Historical Abstract (1971). 1880-1950: K.G.J.C. Knowles & D.J. Robertson, Differences between the Wages of Skilled and Unskilled Workers, Bull. of Oxford Inst. Stat. 109 (1951). 1950-1975: the London series, with 1970-75 from British Labour Statistics, *supra* (various years).

The engineering series is also from Knowles & Robertson *supra* for 1880-1950, then spliced to a series of union pay scales for skilled and unskilled labor in London area engineering industry establishments as reported in British Labour Statistics, annual issues and Historical Abstract.

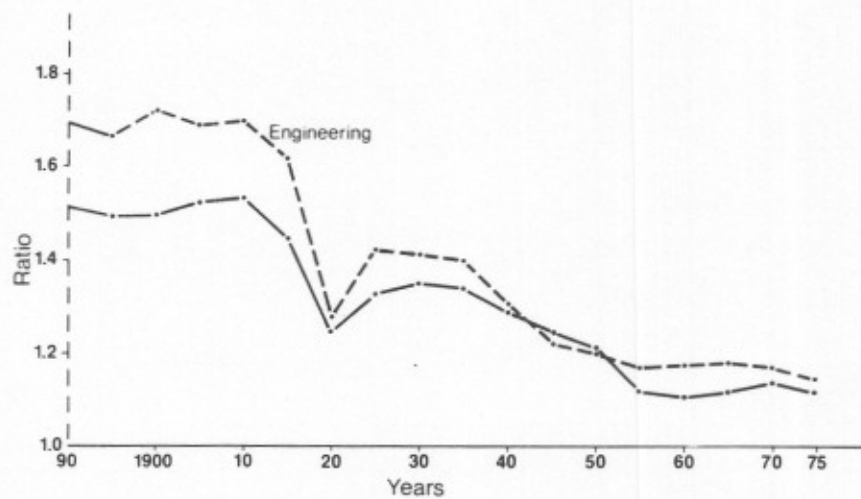
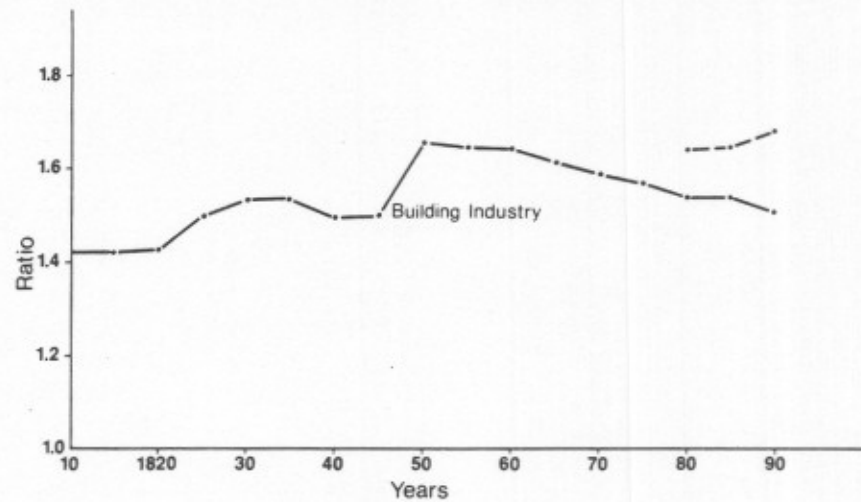


FIGURE VI
BRITISH SKILL DIFFERENTIALS, 1810-1975

siduals from (1)). Finally, as with the American data, the lagged-adjustment regression implies that, unless growth of government has retarded the decline in skill differentials, the coefficients of this variable in (1) and (2) may actually understate the extent of the relevant relationship.

TABLE 6
REGRESSIONS OF BRITISH GOVERNMENT/GNP ON SKILL DIFFERENTIAL, 1820-1975
(5-Year Intervals, 32 Observations)

Regression	Coefficients/t-ratios of			R^2	SE	D-W or H
	Skill Differential (1)	Trend (2)	Lagged Government/GNP (3)			
(1)	-48.63 -9.05	.001 .52		.898	3.61	.98*
(2) First differences	-22.97 -3.03	.118 1.08		.240	3.02	1.83
(3)	-20.92 -3.03	.002 1.01	.596 5.07	.948	2.68	0.76
Mean	1.469		18.27			
SD	.207		10.96			

Sources and Notes:

Dependent variable is government spending/GNP $\times 100$ at five-year intervals from 1820-1975. The following replacements are made to eliminate effects of wars: 1898 (instead of 1900), 1913 (1915), 1922 (1920), 1938 (1940), 1947-1948 average (1945); also 1974 (1975) due to data availability.

The numerator is from Organization for Economic Cooperation & Development, National Accounts of OECD Countries for 1955-74. Data for 1820-1950 are from Alan Peacock & Jack Wiseman, *The Growth of Public Expenditures in the United Kingdom* (1961). They give data at irregular intervals which usually correspond to a year divisible by 5. However, I used their 1822, 1831, and 1841 figures for 1820, 1830, and 1840 respectively. Missing years in the Peacock & Wiseman series were interpolated from percentage changes in British central government expenses (Brian Mitchell & Phyllis Deane, *Abstract of British Historical Statistics* (1962)).

The denominator is GDP at market prices. Data for 1900-1950 are from *The British Economy: Key Statistics, 1900-64* (1965). Organization for Economic Cooperation & Development, National Accounts of OECD Countries; for 1820-1900 from estimates of net national product in Mitchell & Deane, *supra*, spliced to GDP at 1900.

The skill differential is an average of the two series in Figure VI for 1880-1975. The building industry series is spliced at 1880. See text for sources.

* = Significant autocorrelation of residuals.

The coefficient of "Trend" in regression (2) is the annualized constant term in this regression.

Putting the data in Tables 5 and 6 together would imply that Britain has a larger government sector than the United States because the movement toward equality has gone farther there and because the British political system seems more sensitive to the resulting pressures (that is, the coefficient of the same skill differential is larger). This may be too sweeping a generalization from very crude data. To see if it is, I ask the following question. Do the historical *differences* in the size of the U.S. and British governments have anything to do with the minor *differences* in their histories of inequality? The answer is hardly obvious from the preceding data. The broad movements in both government and inequality in the two countries are more notable for their similarities than differences, making it more plausible that some common "third" force is pushing on both variables in both countries at any moment. By focusing on relative effects and thereby eliminating this third force, we might easily be left with data reflecting national idiosyncrasies.³⁴

³⁴ To put this more formally, suppose the true relationship is

This does not, however, appear to be the case. In Table 7 the differences between or ratios of the British and U.S. government/GNP are regressed on differences or ratios of their skill differentials. In either form, the results indicate that any other forces propelling the growth of government seem to be enhanced by more equality. Thus a good part of the differences between the development of British and U.S. government seems explainable by different movements in equality. The main qualification comes from regressions (2) and (5) in the table, which allow for lagged adjustment of relative sizes. Collinearity between the two independent variables makes it hard to separate relative inequality and lagged-adjustment effects, but the direction of the inequality effect is consistent with the other results.³⁵

To summarize, the British and American data did not allow the separation of the between-group and within-group components of income inequality as our model requires. Instead, we were forced to use skill differentials, which come closer conceptually to the within-group measure but which are also highly correlated, at least in the U.S. data, with a plausible between-group measure (the share of income going to the top 5 per cent). The empirical results all point in one direction: the within-group effects in the model dominate. More equality appears to stimulate expansion of the government sector.

2. *Canada and Japan.* These countries are of interest for divergent rea-

$$g_i = \beta Y + \epsilon_i,$$

where g_i = country i 's government/GNP ratio; Y = the cosmic force determining both g_i and g_j which we do not observe; and ϵ_i = random error. We do, however, observe X_i , a country-specific variable (skill differentials) which may be related to Y . For example, suppose

$$X_i = Y + u_i,$$

u_i = country-specific random measurement error. When we estimate the regression

$$g_i = bX_i + v_i,$$

b will be biased toward zero but will have the same sign as β , because of the correlation between X_i and Y . However, if we estimate

$$g_i - g_j = b'[X_i - X_j] + v_i - v_j,$$

which is akin to what is done in Table 7, we remove the presumed "cosmic force" (Y) and are left with

$$g_i - g_j = b'[u_i - u_j] + v_i - v_j.$$

Our independent variable would be purely random and $E(b') = 0$ (so long as the country-specific components of X_i really do not matter).

³⁵ The significant trend term in regressions (1) and (2) is better taken as recommending the ratio model than evidence of any unexplained divergence in government growth. The trend term reflects mainly the post-World War II experience, where both government sectors have grown so large that the absolute gap between the two today (about 12 percentage points) is larger than either government sector 100 years ago.

TABLE 7
REGRESSIONS OF RELATIVE SIZE OF BRITISH AND U.S. GOVERNMENT
SECTORS ON SKILL DIFFERENTIALS, 1870-1975
(5-Year Intervals, 22 Observations)

Regression	Coefficients/t-ratios of			R^2 (4)	SE (5)	D-W (6)
	Relative Skill Differential (1)	Trend (2)	Lagged Relative Size (3)			
<i>Differences</i>						
1	-10.76 -2.19	.103 5.05		.645	3.01	1.69
2	-7.59 -1.28	.076 2.21	.226 .94	.608	3.09	*
<i>Ratios</i>						
3	-3.03 -4.04	.001 .86		.531	.235	1.23
4	-3.24 -4.59			.513	.233	1.21
5	-1.27 -1.24		.464 2.15	.573	.210	*
Mean/SD differences	-.23 .13		5.21 4.80			
Ratios	.86 .07		1.33 .33			

* = H statistic cannot be calculated because of large standard error of coefficient in column (3).

sons, Canada for its historical similarities to the United States and Japan for its sharp differences from Canada, the United States, and Great Britain. I review the Canadian history first to see if the preceding findings can be corroborated. The broad pattern of Canadian economic development is so similar to that of the United States, more so than is Britain's, that it provides a strong check on these findings.

The results in Table 8 generally corroborate and in one respect extend those for Britain and the United States. For Canada, unlike the United States, cross-regional income disparities seem important, and they push in the same direction as personal income equality (column (2), regressions (1)-(3)): both are negatively related to the size of government. This result tends to confirm the importance of the "within-group" inequality effect that has so far dominated the results. Were the "between-group" effect important, large regional inequalities would stimulate rather than retard redistribution in a political system with regional representation. Of course, the inconsistency between the U.S. and Canadian results for this variable ought to give us

TABLE 8
CANADIAN GOVERNMENT/GNP REGRESSIONS, 1880-1975

Dependent Variable: Government Spending/GNP	Coefficients/t-ratios			G ₋₁ (4)	R ² (5)	SE	D-W
	Skill Differential (1)	Regional Inequality (2)	Trend (3)				
1. Canada: level	-12.59 5.02	-54.52 3.90	.30 16.76		.96	2.0	1.08
2. Canada: level	-9.06 2.45	-39.89 2.25	.22 3.39	.30 1.30	.97	2.0	—
3. Canada: first differences	-8.71 2.01	-51.24 2.84	.31 ¹ 3.29		.41	2.1	2.00
4. Canada/U.S.	-1.01 1.24	-.31 1.02	.41 .70		.30	.173	1.26
5. Canada/U.S.	-.47 2.11	-.14 .79			.28	.171	1.24
6. Canada/U.S.	-.63 2.30	-.76 ² .65			.27	.172	1.20

Sources of Canadian Data:

1. *Government spending*

1955-1975. Organization for Economic Cooperation & Development, National Accounts of OECD Countries.

1926-1955. Richard M. Bird, The Growth of the Government Spending in Canada (Canadian Tax Papers No. 51, July 1970).

1870-1926. The annual data are estimates from benchmark data in Bird, *supra*. He gives total government spending for 1870 and decennially from 1890, federal spending annually for 1867-1926, and an "Alternative Series" which includes a part of nonfederal expenditures annually for 1900-26. I use year-to-year percentage changes in these two annual series to estimate annual changes in total expenditures between benchmark years.

2. *GNP*

1926-1975. Same as government expenditures.

1870-1926. Annual estimates from decennial benchmarks for nominal and real GNP, 1870-1910, in Bird, *supra*. I assumed that real GNP grew at a constant rate between benchmarks, and I interpolated annual fluctuations in the GNP deflator from the annual wholesale price index in M. C. Urquhart & K. A. H. Buckley, Historical Statistics of Canada (1965) [hereinafter cited as Historical Statistics]. Nominal GNP in nonbenchmark years is the resulting estimate of real GNP \times the estimated GNP deflator. For 1910-1920, the interpolation uses an annual national income series and for 1920-1926 a net domestic product series in Historical Statistics, *supra*.

3. *Skill differentials*. 1920-1975. An average of skilled/unskilled hourly wages in the building and printing industries for five cities (Halifax, Montreal, Toronto, Winnipeg, and Vancouver). The skilled wage for the building industry is an average of wages for carpenters, electricians, and plumbers, and the unskilled wages is for "labourers." The skilled printing occupations are compositors and pressmen and the unskilled "bindery girls." The printing skill differential is set equal to the building industry differential at 1920 and the two are averaged thereafter. Building industry data for 1920-1960 are from Historical Statistics; for 1960-1975, from Canada Year Book (Ministry of Trade & Commerce, various years). Printing industry data are from Wage Rates, Salaries, and Hours of Labour (Dep't of Labour, now Labour Canada, various years).

1901-1920. Building industry differential from data in Historical Statistics (see above).

1880-1900. These are estimates, spliced to and extended backward from the 1901 value, taken from Historical Statistics. For 1890-1900, an Ottawa and Toronto sample of wages for carpenters, masons, painters, and unskilled laborers are used. For 1885-1890, I use immigration agents' reports of carpenters' and laborers' wages at Halifax, Montreal, Toronto, and Winnipeg. For 1880-1885, I use similar 1882-1885 data for Montreal, Ottawa, Hamilton, and Winnipeg.

4. *Regional differentials*. This is a standard deviation of the log of wage rates across cities. The cities, except where noted, are Halifax, Montreal, Toronto, Winnipeg, and Vancouver, each of which represents an important Canadian region. The sources are the same as for the skill differentials. For 1900-1920, the variable is an average of that for the four building occupations. For 1920-1975, an average of the three printing occupations is spliced to the building industry average at 1920. For 1885-1890, we have a subsample of the post 1900 building industry data (see above—Vancouver and plumber and electrician data are missing). I spliced data from this subsample to a similar one drawn from 1901 data and estimate the 1895 value by linear interpolation. The 1880 values are set equal to 1885.

Notes:

All variables are, where the data permit, three-year centered averages at five-year intervals from 1880-1925. To remove effects of the World Wars on government/GNP, the following replacements are made: 1923 for 1920, a linear interpolation of 1910 and 1923 for 1915, 1939 for 1940, and 1947 for 1945. In lines 1-3, Canadian data only are used. In lines 4-6, Canadian data are divided by the U.S. counterpart. Sample size = 20 (19 for line 3).

¹ Annualized constant term.

² Canadian variable not divided by United States.

pause. One possible explanation, elaborated below, is that changes in Canadian regional inequality over the last century have not been nearly as trend-dominated as in the United States, so collinearity problems are less likely to obscure any true effect of regional inequality.

The negative effect of inequality on the size of government persists in the last three regressions, which focus on the relative size of the Canadian and U.S. government sectors. The effect is predictably weaker in these data and seems confined to the personal income-inequality proxy, which again suggests caution in pushing too far the preceding results for regional inequality. But it is more interesting that a negative inequality effect remains in these data, which abstract from the shared history of the two countries.³⁶

We gain further insight into these results from Figure VII, which displays the data underlying (4)-(6) in Table 8. Canada has typically had the larger government sector, but the difference tended to be greater up to, say, 1930. Relative skill differentials have moved in the opposite direction; they are higher for Canada in the most recent fifty or so years. These opposing movements are reflected in the negative coefficients of the relative skill differentials in (4)-(6) of Table 8.

Figure VII also raises the possibility of lags in the adjustment of government to equality that the regressions have not captured. The relevant labor market history summarized in Figure VII is that the United States has a ten-to-fifteen year headstart on Canada in the movement toward equality. Up to World War I, skill differentials tend to widen in both countries. They then begin to decline in the United States, but only do so in Canada with the onset of the Great Depression. Notice, however, that, whereas the effects of the U.S. headstart toward equality on relative skill differentials ends around 1930, a major part of the narrowing in the relative sizes of the two government sectors occurs thereafter. Indeed, if the relative skill differentials in equations (4)-(6) of Table 8 are lagged by twenty years, explained variation roughly doubles. The relevant lag may be even longer. Glancing back at the U.S. data in Figure IV, another kind of lag is apparent, that of the skill differential behind the broader ("Kuznets") measure of inequality.³⁷ Since all of this implies that movements in the size of government tend to lag behind those of inequality, a model in which the latter "causes" the former gains some credibility. While we cannot pursue the lag structure further with the

³⁶ Note that the standard errors for regression (4)-(6) in Table 8 are on the order of a fourth smaller than those of the British-U.S. counterparts in Table 7.

³⁷ The relevant regression is

$$\begin{aligned} \text{Skill differential}_t &= \text{constant} + 3.3 \text{ Kuznets}_t \\ &\quad (t = 4.7) \\ &+ 2.4 \text{ Kuznets}_{t-1}; R^2 = .97. \\ &\quad (t = 3.4) \end{aligned}$$

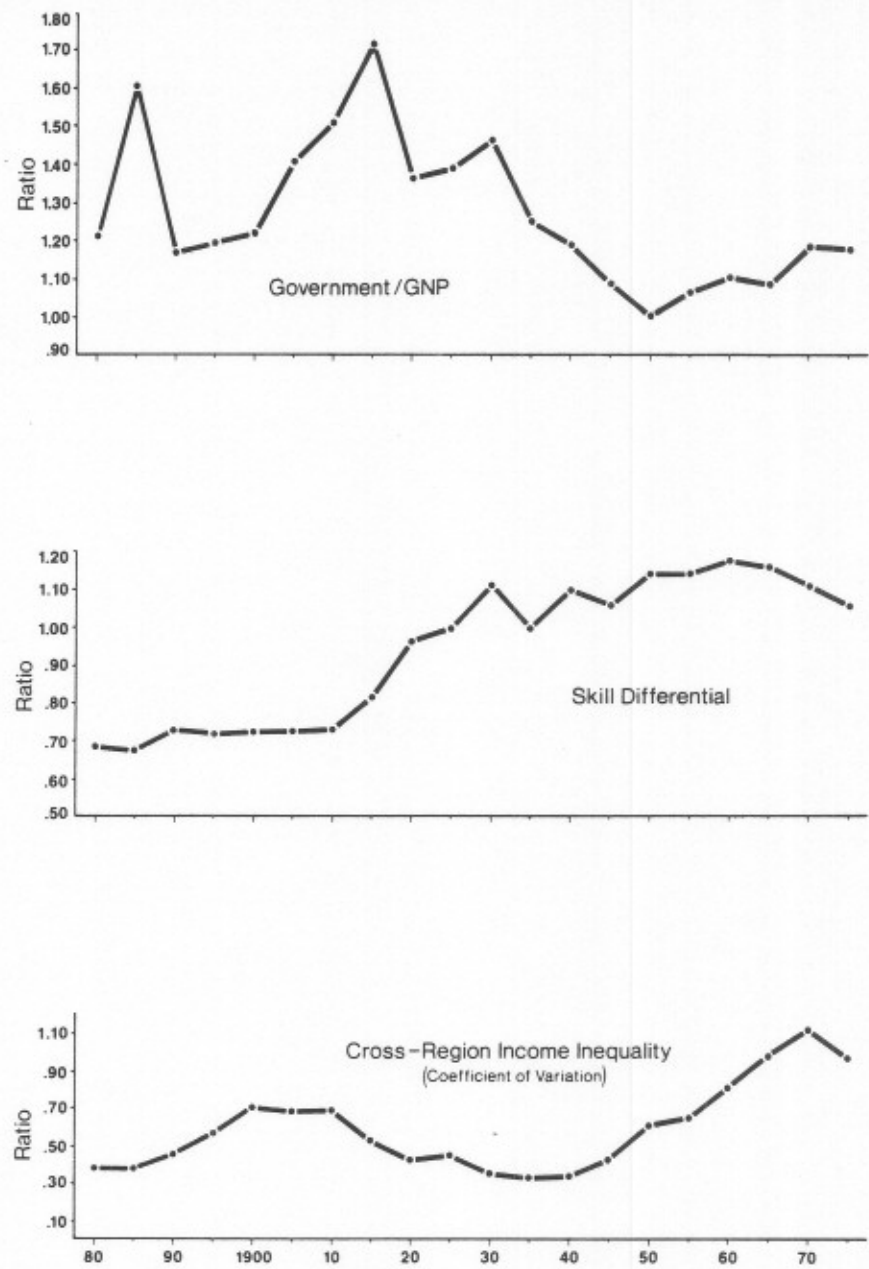


FIGURE VII
CANADA-UNITED STATES RATIOS

crude data and small samples, subsequent data reveal lags to be an important part of the story. In fact, the twenty-or-so year lag that is clear in Figure VII is close to the order of the lag magnitudes that these data will reveal.

The bottom panel of Figure VII reflects a substantial recent divergence between Canadian and U.S. movements in cross-regional equality. From 1900 to World War II, regional disparities narrowed in both countries. Whereas this decline accelerated in the United States, it has actually been reversed in Canada in the postwar period, a fact which may help explain the recent centripetal pressures in that country.³⁸ However, it is evident from Figure VII (and regressions (4)-(6)) that this reversal has not slowed the growth of Canada's government sector. The negative coefficient of regional inequality in regressions (1)-(3) appears to reflect mainly the earlier history. Unlike the United States, Canadian regional disparities widened up to 1900, while its government sector declined or grew slowly. Regional income disparities then narrowed sharply up to about 1930, and this roughly coincides with a period of relatively rapid growth of government.

A Note on the Role of Voting Behavior in the Three Countries

I have so far ignored the role of political institutions in the growth of government in the three basically Anglo countries. Since the theoretical model suggests that they have a role, it is worth asking if the role is sufficiently important to qualify any of the preceding results. In the theory, political institutions would enter under the rubric of "ability." Anything which makes it easier for beneficiaries to return political support ought to stimulate growth of government. Since all three countries have had democratic structures for the periods studied, we must ask whether differences in the administration of these structures have had perceptible effects. One such difference has been the extent of the franchise. Here, there is a sharp division around 1920 when suffrage was extended to women, and the franchise became virtually universal in all three countries. Although the suffrage of women coincided with the beginning of a continuing expansion in the size of government in all three countries, such a crude correlation should be greeted skeptically. Since women represent a roughly random sample from the income distribution, it is unclear that women's suffrage heralded a shift in the demand for redistribution. More to the point, it is doubtful that, with the possible exception of female-headed households, women lacked influence on voting patterns prior to 1920. So we ought to look to the pre-1920 period for unambiguous political effects.

The considerable variety among the three countries prior to 1920 does not

³⁸ In fact, it is Quebec and the maritime province wages which have lagged the rest of the country, at least up to 1970.

seem to explain the role of government.³⁹ Here we must distinguish voter eligibility from participation. In all three countries, participation rates in national elections have been essentially trendless since at least 1900. They have ranged around 70 to 80 per cent for Canada and the United Kingdom and about 15 points less for the United States.⁴⁰ So no change in participation seems connected to the dramatic change in the growth of government experienced by all three countries after World War I. The main differences among the countries occur in pre-1920 eligibility rates (eligible voters/male population over twenty-one). The United States had attained near-universal (90 per cent) male suffrage by 1870. For the United Kingdom, on the other hand, this figure is only one-third. It required an electoral reform in 1884, which doubled eligibility, and another in 1918 for the United Kingdom to close the gap. Canada is the intermediate case. In the immediate aftermath of the British North America Act, it appears that roughly half of Canadian adult males had the franchise. Over the next thirty or so years, most provinces gradually removed property qualifications so that eligibility exceeded three-fourths by 1900. A 1920 federal law made suffrage universal. If the extent of suffrage promotes growth of government, Britain clearly should have had the most rapid growth of government in the nineteenth century, since significant franchise extensions took place in 1832 and 1867 in addition to 1884. But, as we have seen, British government growth was actually negative in the wake of the earlier reforms, and after 1870, all three countries are more notable for their similarities—generally stable government/GNP ratios—than any differences.

These data are too crude to rule out a connection between suffrage and the size of government. They do, however, suggest, that the major changes in the size of government have little to do with extension of the franchise; otherwise the United States would have had by far the largest government sector in 1870.

Japan. Japan provides perhaps a better test of the role of politics than any of the three countries we have looked at so far. The basically democratic institutions that prevailed in these three countries are absent for most of Japan's history. Japanese economic development was also somewhat isolated from the common forces affecting the three Atlantic countries. Japan's particularism is mirrored amply in the growth of its government, which is shown in the upper panel of Figure VIII. Unlike any of the Atlantic triad, the major growth in Japan occurs before World War I. It shares virtually

³⁹ The data here are from Historical Statistics, *supra* note 28; Howard A. Scarrow, *Canada Votes* (1962), for Canada; and Stein Rokkan & Jean Meyriat, *International Guide to Electoral Statistics* (1969), for the United Kingdom.

⁴⁰ There was a perceptible, but temporary, decline in all three countries in the decade or so after women's suffrage.

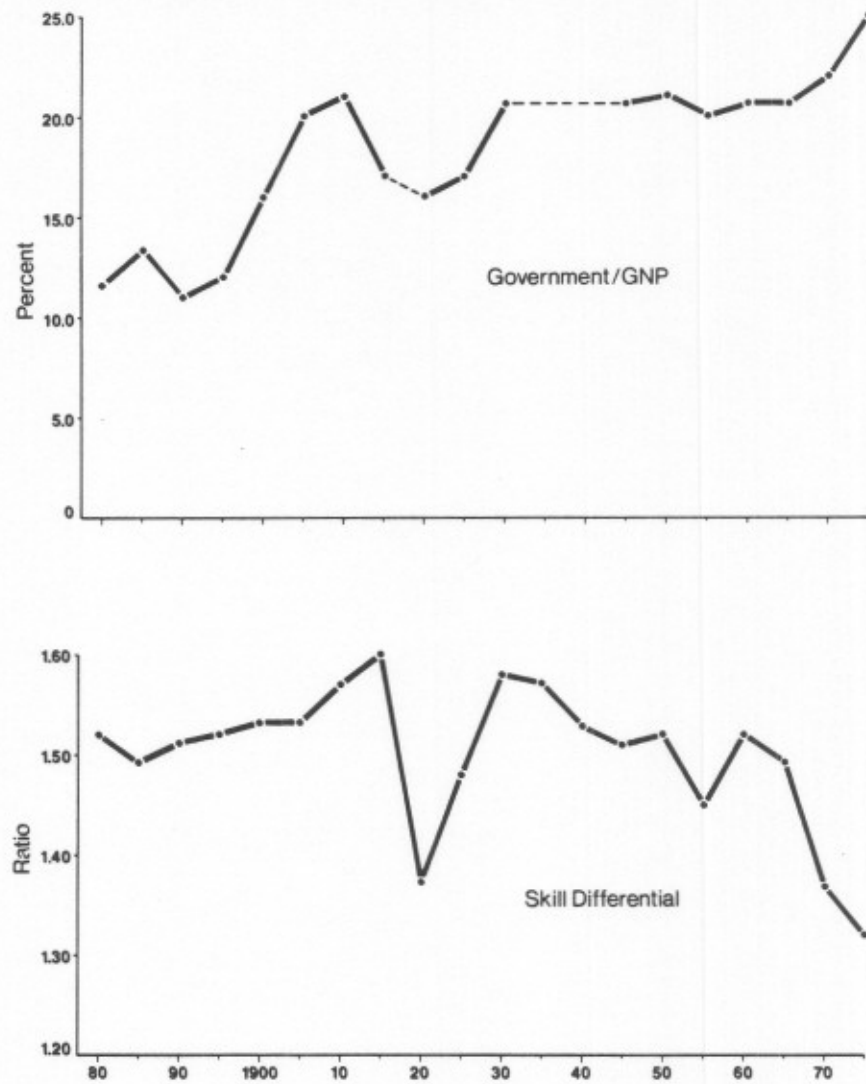


FIGURE VIII
JAPANESE GOVERNMENT/GNP AND SKILL DIFFERENTIAL

none of their subsequent growth and today has the smallest government sector in the developed world.

To what extent can Japan's singular history be reconciled with the previous findings? The first two regressions in Table 9 suggest reconciliation may be difficult. The inequality proxy is positively, rather than negatively, re-

TABLE 9
JAPANESE GOVERNMENT/GNP REGRESSIONS, 1880-1975

	Coefficients			<i>D</i> (4)	<i>D</i> × SK (5)	<i>R</i> ²	SE	D-W
	Skill Differential (1)	Regional Inequality (2)	Trend (3)					
1.	11.45 1.58	-10.24 -.67	.11 4.75			.77	1.98	1.22
2.	11.50 1.68		.12 6.94			.76	1.95	1.16
3.	17.87 2.05		.14 6.42	41.35 1.89	-29.66 1.98	.82	1.76	1.58

Sources: 1. Data for government spending and GNP 1953-1975, are from Organization for Economic Cooperation & Development, National Accounts of OECD Countries. For 1880-1953, government expenditures are those in the "general account" budgets of national and local governments from Koichi Emi & Yuichi Shinoya, Government Expenditures, 7 Estimates of Long Term Economic Statistics of Japan since 1868 (Kazushi Ohkawa, Miyohai Shinohara, Mataji Umemura eds. 1966). The general account excludes war expenditures which were financed through a "special account" and it excludes operating budgets of, but not subsidies to, nationalized industries. GDP is from Kazushi Ohkawa, Nobukiyo Takamatsu, & Yuzo Yamamoto, National Income, 1 Estimates of Long Term Economic Statistics of Japan since 1968 (Kazushi Ohkawa, Miyohai Shinohara, Mataji Umemura eds. 1965).

2. Skill differential is the ratio of daily wages for skilled workers to day laborers in construction. Data for 1880-1939 are from Ohkawa, et al., *supra*; for 1945-1960 from Koji Taira, Economic Development and the Labor Market in Japan (1970); 1960-1975: Japan Statistical Yearbook (Bureau of Statistics, Office of the Prime Minister, various years).

3. Regional inequality is the coefficient of variation of average wages across 13 cities spliced to series for 46 prefectures at 1940. Data are from Taira, *supra*.

4. *D* = +1 for 1955-1975, 0 otherwise.

5. *D* × SK = *D* × skill differential.

Note: The dependent variable is government expenditures/GNP, constructed in the same way as for Britain, Canada, and the United States. Since Japan was more frequently involved in wars, there is more extensive adjustment for Japan. Specifically, the following substitutions are made: 1895 (average of 1893 and 1896), 1905 (average of 1902 and 1908), 1915 (1913), 1920 (average of 1921 and 1922), 1935 and 1940 are linear interpolations of 1930 and 1945 (which is set at the 1947-1948 average).

lated to the size of government, though the coefficient is of marginal significance. (And we cannot replicate the significant effect of regional inequality found in the Canadian data.) A slightly different perspective is gained by looking at the two series in Figure VIII. Except for the "blip" around World War I, the Japanese skill differential shows remarkable stability at least up to 1960. It is within 10 points of its mean of about 150 for the entire period, when the Western differentials tended to lie between 100 and 200. This lack of any pronounced move toward greater equality, a move which is almost universal in the Western world, seems confirmed by other data.⁴¹ A negative

⁴¹ See, for example, Akira Ono & Tsunehiko Watanabe, Changes in Income Inequality in the Japanese Economy, in Japanese Industrialization and Its Social Consequences 363 (Hugh Patrick ed. 1973). Also Yasukichi Yasuba, Evolution of the Dualistic Wage Structure, in *id.* at 49, calculated coefficients of variation in average wages across operatives in each manufacturing industry for selected years from 1909 to 1951. There is no tendency for the coefficients to decline over time for comparable industries. While such a measure will reflect, *inter alia*, age, sex, and skill mix changes, this stability does seem to conform to the general pattern of comparatively minor changes in inequality before 1960.

corroboration of the previous results may be that Japanese government did *not* grow in the twentieth century because it lacked the crucial stimulant, a decline in inequality. Of course, this leaves us with the need to explain the rapid growth before World War I. It seems reasonable to raise here the issue of cost of tax collection even if we must postpone explicit analysis of it. The important changes in transportation and communication costs, the size of businesses, the extent of impersonal markets, and so forth, which occurred in the West in the nineteenth century and which presumably reduce tax collection costs ought to have stimulated growth in government's share of national income there. That this did not occur in the West may imply that, once a fairly rudimentary legal and institutional infrastructure is in place, most important tax-collection economies are achieved. But Japan may not have been so endowed immediately following the Meiji restoration. Its per capita income in the late nineteenth century appears to have been on the order of one-fifth or one-tenth that of the United States, and modern local government institutions did not replace the feudal structures of the Tokugawa era until 1878.⁴² Thus it seems risky to dismiss tax-collection costs as a factor in the growth of Japan's government in the early Meiji years as easily as we can for the Western countries.

The post-World War II period in Japan is especially interesting for two reasons. The obvious one is the radical change in its political institutions from dictatorship to democracy, a change that permits a sharper test of the role of political institutions than for the three Western democracies. The second reason has to do with changes in income inequality. As in its economic development generally, Japan seems to have lagged behind the Western world by around thirty years. The bottom panel of Figure VIII shows a sustained narrowing of skill differentials starting in 1960. I would be reluctant to draw firm conclusions from this brief period's data except that they seem to comport well with other data. Ono and Watanabe, after examining a variety of inequality measures, also date the start of a perceptible decline in inequality at about 1960.⁴³

From Figure VIII it seems clear that neither the political nor income inequality changes has so far produced any dramatic change in the size of Japan's government. But to determine if there are any symptoms of change, line 3 of Table 9 repeats the basic regression with an intercept and slope dummy variable (columns (4) and (5), respectively) for the period from 1955 (the "democratic" era in Japan). The coefficient of the slope dummy ($D \times SK$) addresses the question: did the process linking inequality to the

⁴² Koichi Emi, *Government Fiscal Activity and Economic Growth in Japan, 1868-1960*, (1963).

⁴³ *Supra* note 41.

size of government change when Japan became a democracy? The answer seems to be "yes" and, more interesting, the change is toward the same process that characterized the three other democracies of more equality being associated with bigger government. This regression is, in effect, telling us that the "Robin Hood" motive to redistribution predominates in the non-democratic era (note the now significantly positive coefficient of the skill differential in column (1), line 3), but that within-beneficiary-group considerations are more important in a democracy.

Moreover, this strengthened importance of within-group equality is predicted by the theory. Refer back to (14), which summarizes the within-group effect. Of the variables in that expression, the one most immediately affected by a shift from dictatorship to democracy would be the variable reflecting the ability of the numerous beneficiaries to give their interests political weight. This is F_g , the marginal political product of the benefit, which should be higher in a democracy. After substitution of some first-order conditions⁴⁴ and rearrangement of terms, (14) can be rewritten schematically

$$D = \frac{A + BF_g}{1 - I_g F_g} > 0, \quad (14')$$

where A and B are positive expressions not involving F_g , and D is the derivative on the left-hand side of (14). Treating the advent of democracy as an event (X) which raises F_g by a unit. The effect on D is summarized

$$\text{sgn} \frac{dD}{dX} = \text{sgn}(B + AI_g) > 0. \quad (23)$$

Note that (23) does *not* say that government will grow if F_g increases, but rather that government growth will be *more responsive* to *changes* in inequality within the beneficiary group, whether the changes push for more government or less. This is precisely what the Japanese findings show: no vast expansion of government, but a larger weighting of the within-group equality effect. Moreover, the model implies no correspondingly unambiguous shift in the importance of the between-group effect, which could have obscured the shift we observe in the Japanese data.⁴⁵

⁴⁴ To eliminate F_R , which may also be affected by the shift to democracy.

⁴⁵ The reason for the ambiguity here can be seen most easily by focusing on the marginal political product of numbers of beneficiaries (M_p). This is proportional to $1 - F_g J_p$. An exogenous increase in F_g reduces the marginal product of numbers. When P 's become more responsive, the first-order response is to cultivate them more "intensively," with a higher g given to fewer P so that the ambivalence of the highest income P 's about redistribution can be economized. (This is analogous to Ricardo's extensive margin shrinking when the marginal product of labor rose.) This is why a rise in F_g , by itself, will not increase the optimal G . However, if the rise in F_g is compensated by a decline in J_p , the ambivalence of the marginal P 's is reduced, and the force shrinking the "extensive" margin is attenuated. Now, when there is an

If this analysis is valid (we will subsequently pursue this interaction between equality and political ability), there are profound implications for Japan's future. It appears that the Japanese government sector is on the verge of substantial growth, if its recent move toward greater income equality is as permanent and far-reaching as that experienced in the West some thirty years before. It now has the democratic political structure in which more equality seems to fuel expanding governments. Thus all the conditions now seem in place for Japan to repeat the vast expansion of government which has characterized the Western world since the depression, including perhaps the replacement of its famed intracorporate welfare system with a national social security system.

B. *Post-World War II Experience in the Developed World*

I now want to see whether the postwar experience among developed countries is consistent with the time-series evidence. While government has grown everywhere, there is enough variety to make the investigation interesting. Table 10 provides some relevant data. The general pattern has been that of rapid growth in Northern Europe, slow growth following high initial levels for France and Germany, and slow growth from low or average levels for the non-European countries. There are, of course, some notable exceptions such as Canada recently, Finland for the whole period, and Britain in the 1950s when it was liquidating its empire. The simple question I try to answer is: can income inequality differences help rationalize this variety?

Comparing inequality across countries poses important problems. The data come from a variety of sources in which income concepts, coverage, and so forth can differ greatly among countries and are susceptible to bias. For example, many income distributions have been compiled from tax returns, which are heavily influenced not only by coverage and income definition differences but by differences in enforcement of the tax laws. I am aware of only two attempts to systematically surmount these comparability problems so that a credible ranking of countries by inequality emerges. The first by Lydall, focuses on pretax wage and salary income.⁴⁶ Since it excludes both transfers and property income, this income concept seems like a good proxy for the potential beneficiary-incomes of the theoretical model. Lydall had to rely mainly on tax-based distributions, which he then tried to

increase in between-group inequality. J_p is unaffected, so there is no necessary reason for a rise in F_p to induce a larger rise in G than would otherwise occur; the same rise in G could be optimal if concentrated on fewer P 's. But a reduction in within-group inequality *does* lower J_p . When F_p rises in *these* circumstances, it calls for both more intensive *and* extensive cultivation of the P 's and thus an unambiguously larger rise in G than would otherwise occur.

⁴⁶ Lydall, *supra* note 28.

TABLE 10
THE SIZE AND GROWTH OF GOVERNMENT/GDP
16 Developed Countries Selected Years, 1953-1974

Country	Government Spending/GDP			Percentage Increase		
	1953-54 (1)	1963-64 (2)	1973-74 (3)	(2)/(1)	(3)/(2)	(3)/(1)
Australia	24.2%	25.4%	30.1%	4.8%	18.5%	24.2%
Austria	31.9	34.8	38.3	9.3	10.0	20.3
Belgium	28.1	31.2	39.5	10.9	26.6	40.4
Canada	26.2	28.0	36.4	6.7	30.1	38.7
Denmark	24.4	30.3	46.6	24.4	53.8	91.4
Finland	31.1	31.3	38.4	0.6	22.7	23.5
France	35.6	37.8	38.5	6.2	1.9	8.1
Germany	35.5	36.6	41.9	3.0	14.5	17.9
Italy	27.6	31.5	39.6	14.1	25.6	43.3
Japan	21.0	20.9	24.0	-0.2	14.6	14.3
Netherlands	31.8	36.9	50.7	16.0	37.3	59.3
Norway	30.5	36.5	48.7	19.5	33.5	59.5
Sweden	28.0	36.3	49.0	29.5	35.2	75.0
Switzerland	27.8	28.9	35.2	4.1	21.8	26.8
United Kingdom	32.7	33.7	42.0	2.9	24.8	28.4
United States	27.0	28.0	32.2	3.9	14.8	19.3
Average	28.9	31.7	39.4	9.7	24.1	36.9

Sources: See notes to Table 2 for sources.

adjust to a common basis (adult male full-time workers). He is sometimes cryptic about how these adjustments are made, particularly where resolving conflicts among different data for the same country. His ranking, however, can be useful here, since it is independent of this problem.

The more recent study by Sawyer for the Organization for Economic Cooperation and Development (OECD) has the advantage of drawing its data from household budget surveys, rather than tax records, supplemented by unpublished data designed to mitigate comparability problems.⁴⁷ The major drawback, for our purposes, is the inclusion of transfers in the basic income concept (household pretax money income). Sawyer is able to estimate income distributions, standardized for household size,⁴⁸ for ten countries in Lydall's sample. For six countries, the two studies are in broad agreement about inequality rankings. For four there are clear discrepancies since the countries wind up in different halves of the two rankings. Columns (1) and (2) of Table 11 summarize the findings of the two studies.

⁴⁷ Malcolm Sawyer, *Income Distribution in OECD Countries*, in 19 OECD Economic Outlook, Supp. at 3 (Occasional Studies, July 1976).

⁴⁸ The standardization is important. Countries with generous pension and unemployment insurance schemes have many one-person households: more retired and young single people find it feasible to set up their own households. These households typically have below average incomes, so their proliferation tends to increase inequality measured over all households.

TABLE 11
COUNTRIES RANKED BY INCOME EQUALITY—TWO COMPARATIVE STUDIES AND RELATED DATA

Country	Rank Order (1 = Most Equal)		Coefficient of Variation—Factory Workers (3)
	Lydall (1)	Sawyer-OECD (2)	
Australia	1	7	—
Austria	10	—	—
Belgium	8	—	13.5
Canada	7	6	15
Denmark	2	—	—
Finland	12	—	—
France	13	10	19
Germany	5.5	9	15
Japan	14	5	—
Netherlands	11	1	4
Norway	5.5	3	10
Sweden	4	2	11
United Kingdom	3	4	8
United States	9	8	18.5

Notes: See text for income concepts used, years covered, and so on. A dash indicates the country is not in the sample. Norway is here assigned equal rank with Germany in the Lydall sample, partly on the basis of the OECD data. Lydall is unable to reconcile two sources of data, one of which would place it "near Germany (1968, p. 161)—that is, relatively high in degree of equality—and another which would place it much lower. Given the OECD findings, the "tie" with Germany may still leave Norway's ranking too low.

Column (3) is the coefficient of variation $\times 100$ of average wage rates for production workers across manufacturing industries ca. 1960 from Organization for Economic Cooperation and Development, *Wages and Labour Mobility* (1965). Industries are approximately two-digit SIC level. Wages are hourly for males, except: United States and Germany (both sexes), France (yearly), and Belgium (daily).

The four discrepancies are divided equally in direction. They occur with Australia and Germany (lower OECD ranks), on the one hand, and Japan and the Netherlands, on the other. The following two obvious possible sources of these discrepancies cannot explain them.

1. *Time period.* Lydall's ranking is for the late 1950s, and Sawyer's is for the late 1960s. However, Sawyer provides data for three of the countries in question (Germany, Japan, the Netherlands) which go back to the Lydall period. In no case is there any change in inequality remotely close to explaining the discrepancy. More generally, Sawyer's retrospective data imply that any 1960 ranking would essentially duplicate that for 1970.

2. *Income definition.* The inclusion of transfers in Sawyer's data raises forcefully the issue of the endogeneity of equality. While transfers may affect cardinal measures of inequality, they do not appear to explain the discrepancies in rank. Sawyer provides decile income shares. If the bottom two deciles—where transfers are heavily concentrated—are deleted and the countries re-ranked, the discrepancies remain. Notice that each discrepant couplet contains one country with extensive transfers (Germany, the Nether-

lands) and one with unusually low transfers (Australia, Japan). Similarly, each couplet has one "big government" and one "small government" country. So government-induced effects on inequality do not appear to resolve the specific discrepancies, though they still may affect the general pattern of the ranks.

The third column of Table 11 shows coefficients of variation in average hourly wages across manufacturing industries from another OECD study. While such a measure will be affected by, for example, differences in skill mix across industries and in national industry definitions, it shares with Lydall the advantage of focusing on income least directly affected by the tax-transfer system. Nevertheless, it would resolve two of the disputed cases (Germany and the Netherlands) in favor of Sawyer. For the remaining seven countries, column (3) basically corroborates both the Sawyer and Lydall rankings.

Since it is beyond the scope of this paper to resolve these differences, I will assume that a "true" ranking of late 1950s earnings inequality is given by: $L + kD$, where L = Lydall rank, k = constant, and $D = -1$ for Japan and the Netherlands and $+1$ for Australia and Germany. Presumably, $k > 0$. The essential question is whether any such ranking scheme can rationalize either the size or growth of government.

The size-growth distinction is especially important in this cross section in light of Lydall's discussion of the recent history of inequality. He finds that the broad outlines of the British, American, and Canadian twentieth-century experience hold almost everywhere in the developed world. Some time around World War I, wage and salary inequality began to decline and some time around 1950, the decline flattened or stopped. Kuznets's data give much the same impression about upper-tail money incomes.⁴⁹ He simply reports what is available in the literature, so comparability across countries is risky. But a clear pattern emerges. Around World War I the top 5 per cent of income recipients in the typical developed country account for around 30 per cent of national income and the fragmentary nineteenth-century data show no clear trend from 1870 to World War I. However, by about 1950 this share falls to just under 20 per cent. Crude interpolation of Sawyer's data for the upper two declines implies that the *circa*-1970 figure is around 17 per cent. In broad outline, the growth of government follows a similar path, in that the aftermath of World War I coincides with a permanent enlargement and sustained growth of government. An important detail, however, is that for many countries a major part of the growth of government has occurred in the last twenty-five years, or after the main force of the trend toward equality had been spent. If equality is indeed a major determinant of the

⁴⁹ Kuznets, *supra* note 26.

equilibrium size of government, a lagged-adjustment process has been dominating recent experience. Thus recent *growth* of government would be more closely related to the level of inequality than absolute size.

This conjecture is confirmed by the data in Table 12, where the size of government at the time of Lydall's ranking and its subsequent growth are regressed on his ranking and the correction factor from Sawyer's study. Size of government and inequality were essentially uncorrelated in the late 1950s. But there is a very strong negative correlation between inequality then and subsequent growth. Some combination of the Lydall and Sawyer data can explain most of the recent growth no matter how the growth is measured, whether we include or exclude defense spending, or focus on transfers or on consumption.

A major puzzle in the table, however, is lack of evidence of convergence toward equilibrium. None of the coefficients of the government-size variable have the expected negative sign and two (in 6 and 9) suggest an explosive system. The puzzle did not disappear, though the explosive tendency did, when I replicated the relevant regressions for growth in the last ten years instead of the last fifteen. It seems scarcely credible that the governments of, for example, the Scandinavian countries and Holland will continue to grow substantially faster than the rest of the world, yet that is what Table 12 implies.⁵⁰

One way to rescue stability from these data is hinted at by the scheme in (19)-(22). Let X in (17) increase with equality, so $b > 0$. From (22) the whole coefficient of the size of government $[-a(1 + bc)]$ can be zero or even positive while $-a < 0$ if $c < 0$. This would mean that increased government spending *reduces* measured equality. Since our basic equality measure is of pretax earnings, less equality may not be so far-fetched. And the simultaneous slowing of the decline of inequality and growth of government is at least crudely consistent with this sort of process. However, crude extrapolation of prewar-inequality trends hardly provides sufficient evidence.

The broad outlines of the results from the international cross section strongly confirm the time-series evidence. At least for developed democracies, reduced inequality of income stimulates the growth of government. The results also imply, much more strongly than do the Canadian and U.S. time series, a considerable lag in response of the size of government to greater equality.

⁵⁰ The essential results in Table 12 are reproduced if the arguably atypical years, 1975-76, are substituted for 1973-74. Also, if the OECD dummy is replaced by a synthetic OECD ranking of the fourteen countries which uses the Lydall rank to interpolate the missing data, the counterpart to regression (10) gives about twice as much weight to this variable as to the Lydall ranking, though both are significant. If, as column (3) of Table 11 suggests, the Sawyer data more accurately measure inequality, we would expect those data to get the larger weight if there is a negative correlation between growth of government and "true" inequality.

TABLE 12
REGRESSIONS OF SIZE AND GROWTH OF GOVERNMENT/GDP ON INCOME EQUALITY
MEASURES, 14 COUNTRIES, 1958-1959 TO 1973-1974

Dependent Variable	Coefficients/t-ratios			R ²	SE
	Lydall Rank (L)	OECD Dummy (D)	1958-1959 Government/GDP		
<i>Size 1958-1959</i>					
1. Rank (1 = largest)	-.22 -.77			.048	4.24
2. Rank	-.47 -1.32	-3.03 -1.14		.145	4.19
3. Log (Government/GDP)	.27 .67	2.26 .74		.054	4.80
<i>Growth, 1958-1959 to 1973-1974</i>					
4. Rank (1 = most % growth)	.56 2.35			.315	3.60
5. Rank	.56 2.17		.028 .11	.316	3.76
6. Rank	1.20 6.80	7.26 5.55	.226 1.61	.832	1.95
7. Rank	1.10 6.24	6.58 4.97		.789	2.09
8. Log Δ (Government/GDP) × 100	-1.77 2.41		.306 .16	.346	11.04
9. Log Δ	-3.43 -6.55	-20.17 -5.06	.151 1.41	.816	6.14
10. Log Δ	-3.31 -6.14	-18.92 -4.66		.780	6.41
11. Δ Government/GDP × 100	-1.28 -4.64	-7.65 -3.67		.673	3.29
<i>Subcategories of Government/GDP, Log Δ × 100</i>					
12. Nondefense	-3.49 -3.36	-5.90 -.76		.561	12.34
13. Government consumption	-2.88 -3.88	-3.09 -.55		.646	8.80
14. Government transfers	-4.35 -4.16	-39.64 -5.02		.711	12.47

Notes: The 14 countries are listed in Table 11. L = "Lydall" variable in Table 11. D = +1 for Australia and Germany, -1 for Japan and the Netherlands, 0 for all other countries.

Transfers in the 14 include interest on public debt.

The 1958-1959 Government/GDP independent variable is a rank for 5 and 6, and a log for 8 and 9.

The international data seem to say something even stronger. Nothing much besides income inequality is needed to explain the growth of government. We are able to pretty much write the history of government growth in the next fifteen years from what we know about income inequality in 1960. In the next section, we show that the relationship is more complex. Moreover, the complexity is hinted at in the international data. Consider the cases of Finland, France, and Germany which appear not to have been nearly as affected by this century's egalitarian tendencies as, say, Holland or Sweden.⁵¹ Yet, by the early 1950s, their government sectors were all larger than average. To be sure, they have now been surpassed by the more egalitarian countries, but their experience hints that Japan may not be alone in the recent emergence of the stimulative effect of equality on government.

C. State and Local Governments in the United States

An examination of state and local government budgets promises to extend as well as corroborate the previous results. We can employ a fairly extensive sample of comparable data on both government budgets and a diverse set of population characteristics to test parts of the theory that were inaccessible with the preceding data. For example, we can at least hope to exploit cross-sectionally comparable data on income distribution to distinguish "between-" from "within-" group inequality effects

These virtues are, however, bought at a considerable potential cost. The exigencies of statistical analysis force us to treat the nonfederal jurisdictions as essentially independent observations. Yet they are neither independent of what goes on at the federal level nor of each other. To cite just one problem raised by interdependence, the ability of a local government to serve redistributionist motives is going to be constrained by interjurisdictional competition, both for the tax base and potential supporters. Whereas that possibility did not seem important in the cross-country comparison—small open economies, for example, Denmark, did not appear constrained to have small government sectors—the possibility seems substantially more important across states and localities. Our fears may be partly allayed by data on the actual redistributive impact of governmental tax-spending programs. Reynolds and Smolensky's results indicate that both federal and nonfederal budgets entail substantial rich-to-poor redistribution, and that the nonfederal redistribution is actually the more extensive.⁵²

Even if there is considerable redistribution at the local level, a cursory

⁵¹ For France, this is confirmed by fragmentary skill differential data in Organization for Economic Cooperation and Development, *Wages and Labour Mobility* (1965). Unlike Britain, the United States, and Canada, these show no narrowing at all since 1930.

⁵² Morgan Reynolds & Eugene Smolensky, *Public Expenditures, Taxes, and the Distribution of Income: The U.S., 1950, 1961, 1970, (1977)*.

TABLE 13
REGRESSIONS OF STATE AND LOCAL GOVERNMENT EXPENDITURES/STATE PERSONAL INCOME
(48 States, 1942-1972)

Form of Dependent Variable	1942, 1957, 1972 Average		1972	(1972)- 1/2(1942)	1972-1942	
Model	Complete Adjustment after 15 Years		Complete Adjustment, 30 Years	50% Adjustment 30 Years	Indefinite Adjustment	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
POP	-.73 2.65	-.82 3.21	-.41 .31	-.35 .29	-.29 .25	-.14 .12
ED	.35 .60	.47 .80	.35 .37	.35 .41	.34 .41	.13 .16
SD2095	2.05 .33	2.06 .33	-6.50 .68	-6.56 .76	-6.61 .79	-6.98 .84
SH5	-8.02 .82		-7.45 .53	1.36 .11	10.18 .82	
R ²	.26	.25	.12	.10	.10	.08
SE	1.71	1.71	2.67	2.39	2.32	2.31

Notes: The dependent variables are constructed from the ratio of general expenditures by state and local governments in a state to that state's disposable personal income ($\times 100$). Government expenditures are from the U.S. Bureau of the Census, Census of Governments (various years), while personal income is from U.S. Bureau of the Census, Survey of Current Business (various years). Columns (1) to (5) are variants of the partial adjustment model:

$$g_{12} - g_{12}^* = k(g_{12}^* - g_{12}),$$

where g_t is this ratio for year t , g^* is its target, and k is a fractional adjustment coefficient. This can be expressed

$$g_{12} - jg_{12} = kg^*, \quad j = (1 - k)$$

and the variables in (2) and (5) are constructed accordingly. In column (1), g_{12} , represented by an average centered on 1957 to reduce error, replaces g_{12} and k is set = 1.

Independent Variables

ED: Mean years of schooling attained by population over 27 in 1940 from U.S. Bureau of the Census, Census of Population, State Volumes. For college graduates, I assume 90% complete 16 years and 10% 17 years.

SD2095: Average of 1950 value and ca. 1920-1930 estimate of the standard deviation of log of income of male heads of households in the 20th to 95th percentile of the income distribution. 1950 data are from Census of Population, State Volumes, *supra*, which gives a distribution by dollar intervals. For each state, a continuous function was fit to these data by method of cubic splines up to the open-ended upper income interval; this latter was approximated by a Pareto distribution. From this, we were able to estimate income = $f(R)$ where R is an individual's ranking in the distribution. For this purpose, each state's population was set = 1000, and we computed SD2095 from $f(200)$, $f(201)$, ..., $f(950)$.

The 1920 value is estimated from

$$SD2095_{20} = A + \sum b_i X_{i,1920},$$

where the X_i are

1. log of per capita income
2. $\sqrt{w(1-w)}$, w = proportion of population white.

TABLE 13 (Continued)

3. $[\sqrt{R(1-f)}](I_f - I_d)$, f = proportion farmers. I_f, I_d is log of per capita income of farmers and other respectively. (The motivation for the square root constructs is that, if the only source of dispersion in the population is, for example, $I_f \neq I_d$, this formula gives the standard deviation of log income in the population.)

4. SH5 (see below).

With the exception of w , which is from U.S. Bureau of the Census, Historical Statistics of the U.S. (various years), all these variables are from Leven, *Income in the Various States* (1925). The b_i are coefficients from a regression of the 1950 SD2095 on the 1950 counterparts to X_i ($R^2 = .9$ and all coefficients were significant).

(The coefficient of $\sqrt{w(1-w)}$ was multiplied by 1.5. In principle, this variable should include an income difference term like that in 3. I had to exclude such a term because the 1920 counterpart does not exist. The 1950 coefficient therefore includes the average racial income difference. For the mid-1930s, when the first racial income data are available, that difference is around $1.5 \times$ that of 1950. A is set so that the mean of the 1920 estimate = .53, which is the value for the first comparable U.S. income distribution (1929)).

SH5: share of state income of wealthiest 5%, average of 1950 and 1920. The 1950 value is from $f(R)$, described above, and the 1920 value is from Leven, *supra*. (It is restricted to nonfarm incomes.)

POP: log of state population in 1942, or (columns (3)-(6)) change between 1942 and 1972. From U.S. Bureau of the Census, *Statistical Abstract* (various years). The means (standard deviations) of the variables are: Average of $g_{72,42,37} = 14.7$ (1.9); $g_{72} - g_{42} = 11.8$ (2.3); ED = 8.40 (.89); SD2095 = .451 (.083); SH5 = .246 (.031). t -ratios are below coefficients.

glance at the data suggests another problem. Clearly broad historical forces producing ubiquitous growth of government dominate any local variety. For the period 1942-1972, the average ratio of state and local spending to personal income across forty-eight states was .15 with a standard deviation of only .02. The average change (standard deviation) between these years is .12 (.02). Variation across states is thus much smaller than across countries (see Tables 2 and 10). This small variation left to be "explained" by local factors poses a substantial constraint on the added insight these data may provide.

In Table 13, I attempt to implement the three main implications of the theory, which are that the size of government responds (a) positively to income inequality between prospective beneficiaries and taxpayers, (b) negatively to inequality among beneficiaries, and (c) positively to the "ability" of beneficiaries to process information. The empirical counterparts to these three notions are:

1. Between-group equality: the share of a state's income accounted for by the richest 5 per cent of the population (SH5).
2. Within-group equality: the standard deviation of the log of income of the group in the twentieth to ninety-fifth percentile of the income distribution in each state (SD2095).
3. Ability: average years of schooling (ED). The choice of the ninety-fifth percentile as a lower bound for the SH variable was forced by the data. When this bound is lowered, the correlation between the SH and any corresponding SD variable rises dramatically; for example, it is on the order of .8 to .9 if the lower bound of SH is the eightieth percentile and the upper bound of SD is anything up to eighty, compared to .4 when ninety-five is the lower bound. This intercorrelation makes it difficult to distinguish "between-" from "within-" group effects. The motive for excluding the poorest 20 per cent of the population was the model's suggestion of "Director's Law": the

very poorest may not have sufficient ability to be included as beneficiaries. The results, however, were basically the same when the lower bound for SD was zero and the upper bound was the sixtieth or eightieth percentile.⁵³ In light of the results in Table 4, state population is included as an independent variable.

The dependent variable is the ratio of state and local government expenditures to personal income, or its change, for each of forty-eight states. The data are for 1942, 1957, and 1972. The motive for this lengthy time span was to gain insight into the lag process, which the international cross section and some of the time series suggested was an important part of the story. An initial attempt at implementing a conventional partial adjustment model like (19) failed.⁵⁴ Therefore, Table 13 shows a range of results. Specifically, the income distribution and ability variables are defined as of *circa* 1940, that is, the start of the thirty-year period.⁵⁵ These initial conditions are assumed to determine a target level of the ratio of government spending to personal income. Then a range of adjustment rates to this target is imposed on the data via suitable definition of the dependent variable.⁵⁶ The last column of the table departs from the partial adjustment framework in favor of a less specific form: the initial conditions *circa* 1940 simply determine the rate of change over the indefinite future.

The results are uniformly disappointing. None of the coefficients of interest are distinguishable from zero. Some hint of the source of this sharp contrast with previous results is, however, given by the underlying data. The simple correlations between the ability (ED) and within-group inequal-

⁵³ Similarly, cutting out either the lower or upper tail of the education distribution made no substantial difference.

⁵⁴ Entering the lagged dependent variable as an independent variable always yielded absurdly low adjustment coefficients—on the order of .2 for 30 years. The reason appears to be that “state-specific” effects not captured by the model persist over time—for example, New York had unusually large governments in 1942 as well as 1972. Thus, when a 1972 expenditure variable is regressed on its 1942 counterpart, the coefficient of the latter (1 – adjustment coefficient) tends to have a positive bias.

⁵⁵ Usable data on income distributions begin with the 1950 census. (There are some in 1940, but always with a frighteningly large group reporting no or trivial income.) But these data are an implausible proxy for initial conditions around 1940. We have seen that there was a sharp narrowing of income dispersions generally beginning around 1930 and ending around 1940, so the 1950 distribution is more likely to typify the end rather than the beginning of our 30-year period.

The way I took out of this difficulty is as follows. For the early 1920s data are available on several important correlates of SD2095 in 1950. The 1920 counterparts are then weighted and summed to generate an estimate of SD2095 for 1920 (see note to Table 13). This is then averaged with the 1950 value to generate the variable used in the regression. In substance, we are assuming that policy decisions made in 1940 respond to about half of the profound change in inequality that occurred during the depression and World War II.

⁵⁶ This procedure confines any state-specific effect to the residual of the regression, thereby avoiding any obvious bias of the coefficients.

ity (SD2095) variables, on the one hand, and the dependent variable, on the other, always have the "correct" signs (positive and negative, respectively). These correlation coefficients range between .2 and .4 in absolute value, depending on the definition of the dependent variable. While these values are not spectacularly high, they are often significant with only moderate risk of error. (The simple correlation on between-group inequality (SH5) is, however, typically negative, sometimes significant. Yet, when that variable is deleted from the regression, as in column (2) or (6) there is no improvement in the performance of the remaining variables.) There is, however, a substantial negative correlation (around $-.9$) between ED and SD2095, which may be helping to obscure their independent effects.

The negative correlation between education and inequality may be a systematic outcome of the human-capital accumulation process.⁵⁷ If this is so, it raises not only statistical problems but important interpretive problems for our previous results of a fairly consistent negative correlation between inequality and government/GNP. But if inequality and education are also negatively related, could not part of the negative correlation reflect the effects of increased education (political "ability")? To be sure, increased education may have been partially reflected in the typically positive "trend" components of the time-series regression. Our cross-sectional data, however, raise the possibility that inequality is a better proxy for ability than simple trend. A still more subtle possibility, encountered both in the Japanese data and the theory, is summarized by (14') and (23). Perhaps there is no simple relationship between the size of government, on the one hand, and inequality and ability, on the other. Rather, the latter two interact. Explicitly the general scheme estimated in Table 13 is

$$g = a \cdot \text{ABILITY} + b \cdot \text{INEQUALITY} + X, \quad (24)$$

where X = other factors influencing the size of government (g)

a, b , = constants, $a > 0, b?$

⁵⁷ In what Gary S. Becker, *Human Capital* (1975), terms the "egalitarian approach" to human capital accumulation, interpersonal differences in the costs of funds are the major determinants of differences in education. So those with a lower cost of funds buy more education and, at least on the margin, earn lower rates of return. *Ceteris paribus*, the income distribution is more equal, the lower the rate of return. Becker cites scattered evidence of a decline over time in rates of return, which, given the simultaneous spread of education, would seem consistent with the "egalitarian approach." Barry R. Chiswick, *Income Inequality: Regional Analyses within a Human Capital Framework* (Nat'l Bureau Econ. Research, 1974), shows a strong negative correlation between rates of return and mean education across states, which is also consistent with the egalitarian approach. In his work, this rate of return \times standard deviation of education is the crucial systematic determinant of income inequality. Since schooling inequality and mean schooling are uncorrelated, the clear implication is that the negative schooling-income inequality relationship which we observe is driven by the tendency for more schooling to lower rates of return.

In spite of our attempt to decompose INEQUALITY, measures like SD2095 tend to be highly correlated with any summary measure of the whole income distribution, like SD0100. So, if SD2095 is our proxy for "INEQUALITY," b will absorb both within- and between-group effects. But if increased ability—whether due to a shift to democracy, as in Japan, or to more education—raises the marginal political impact of g , then (14') and (23) tell us that the weight on the within-group effect is increased. Since this effect is negative, (23) would imply the approximation

$$b = b_0 + b_1 \cdot \text{ABILITY}; b_1 < 0, b_0? \quad (25)$$

The second term here approximates the derivative in (23); it says that an increase in ability enhances the stimulative effect of equality on the size of government. (Since b_0 still contains both within- and between-group effects, its sign remains uncertain.) Substitution of (25) into (24) yields

$$g = a \cdot \text{ABILITY} + b_0 \cdot \text{INEQUALITY} + b_1 \cdot (\text{ABILITY} \cdot \text{INEQUALITY}) + X. \quad (26)$$

The scheme in (26) is estimated in Table 14, and many of the uncertainties evident in Table 13 appear to be clarified. The explanatory power of the regressions in Table 14 (R^2 , SE) increases substantially over their counterparts in Table 13, which lends credibility to the interactive scheme in (26). The precision of the coefficients is correspondingly improved, allowing some conclusions:

1. The coefficient of ED is now always significantly positive, as the theory implies, if ED is a proxy for "ability."

2. There is some evidence for a positive between-group inequality effect. Most of this evidence derives from the significantly positive coefficient of SD2095, which is the counterpart to b_0 in (25). This says that, at low levels of ability, more inequality *increases* the size of government. An effort to further isolate this between-group effect in the coefficient of SH5 yields mixed results. The coefficient varies from insignificantly negative to "suggestively" positive, depending on the form of the dependent variable. If SH5 is deleted, none of the other coefficients changes very much.

3. Most important, the significant negative coefficient of the interaction term corroborates what we found in the Japanese data: The within-group effect gets stronger (and eventually outweighs the between-group effect) the more "able" the populace.

4. We are unable to pin down the relevant lag structure. The various lag structures explain the data about equally well,⁵⁸ and the pattern of the

⁵⁸ Regressions (3)-(5) of Table 14 purport to explain g_{1972} . When we generate predicted values of this variable and compare them to the actual g_{1972} , we get roughly the same standard errors (2.52, 2.38, and 2.41, respectively). Regression (1) explains a different variable, $\hat{g}_{1942.57.72}$.

TABLE 14
STATE AND LOCAL GOVERNMENT EXPENDITURES/PERSONAL INCOME REGRESSIONS

Form of Dependent Variable	1942, 1957, 1972 Average		1972	(1972)-1/2(1942)	1972-1942	
Model	Complete Adjustment after 15 Years		Complete Adjustment, 30 Years	50% Adjustment, 30 Years	Indefinite Adjustment	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
POP	-.71 2.69	-.75 3.10	-.67 .53	-.60 .54	-.53 0.49	-.27 0.24
ED	4.51 2.39	4.71 2.59	7.27 2.48	7.10 2.74	6.92 2.75	5.81 2.39
SD2095	72.11 2.33	74.50 2.47	109.88 2.29	107.02 2.53	104.17 2.54	90.65 2.23
ED × SD2095	-9.01 2.30	-9.32 2.45	-14.98 2.47	-14.62 2.74	-14.26 2.75	-12.60 2.45
SH5	-4.07 0.43		-.01 0.00	8.62 .71	17.26 1.46	
R ²	.34	.34	.23	.24	.23	.19
SE	1.63	1.62	2.52	2.22	2.16	2.19

Note: See Table 13 and text for definitions and sources of variables.

coefficients provides no further illumination.⁵⁹ Some experimentation with different lags than those assumed in Table 14 did, however, suggest that very short lags in response were inappropriate.⁶⁰

Table 14 shows that the concept of "ability" is important both in its own right and on account of its interaction with equality. I therefore try to improve the simple proxy used in Table 14 (education). The theoretical

However, if one (a) assumes that standard deviations of g are proportional to means and then (b) synthesizes a \tilde{g} with the same mean and variance as g_{1972} , the standard error of that synthetic variable from regression (1) would also be about the same (2.33) as the others.

⁵⁹ In the lagged-adjustment model, the implied coefficient of the target g = regression coefficient/adjustment coefficient. Thus, if the regression coefficients increased roughly in proportion to the assumed adjustment coefficient, we would at least know something about the target g , even if we could not specify how quickly the adjustment proceeded. However, the regression coefficients are largely invariant to the assumed adjustment coefficient.

⁶⁰ For example, when the dependent and independent variables were made contemporaneous, the precision of the regression coefficients and the overall fit of the regression tended to deteriorate, though the overall pattern of the results was the same as in Table 14.

TABLE 15
STATE AND LOCAL GOVERNMENT EXPENDITURES REGRESSIONS
WITH ADDED POLITICAL ABILITY VARIABLES

Dependent-Variables	1942, 1957, 1972 Average	1972-1942 Change
Independent Variables (Coefficient Symbol, Equation (28))	Weights for Ability Index (1) (2)	Weights for Ability Index (3) (4)
POP	-.69 2.41 [3.05]	-1.23 1.10
Ability Index: (a)	.86 3.95 [4.58]	1.09 3.78 [4.41]
VPAR (c_1)	-.77 3.05	-.97 3.60
FARM (c_2)	.73 2.03	-.11 .37
LABOR (c_3)	.16 .60	.21 .98
SD2095 (b_0)	186.95 2.24 [4.37]	15.50 0.15 [2.21]
SD2095 \times Ability (b_1)	-1.78 2.24 [4.38]	-2.23 3.51 [4.05]
SH5	12.00 1.24 [1.30]	24.67 1.93 [2.41]
R^2	.51	.40
SE	1.46	1.53

Note: See text and Table 13 for sources and definitions of variables.

The numbers in brackets are t -ratios calculated on the assumption that the index weights are known beforehand. They are obtained by computing the ability index for each state and substituting the index for ED in ordinary least squares regressions like those in Table 14.

concept can, after all, comprehend any factor facilitating the political repayment of benefits. In Table 15, I consider two additional factors that might have such potential: voter participation and the size of organized interest groups (specifically labor unions and farmer cooperatives). The historical evidence did not imply an important role for voter turnout, but the cross-section data permit a more refined test. There is also a historical motivation for the interest-group variables. The early twentieth-century expansion of government coincides with the emergence of broad-based interest groups, like labor and farm organizations, which successfully exerted influence on the political process. By 1940, the start of our period of analysis

for the states, these groups had attained roughly their present size. I want to see if the influence they subsequently exerted at the local level led to a net expansion of local governments. Also, since these groups did not organize primarily for local political action, we can distinguish the impact of organized interests on the growth of government from any stimulus to such organization provided by that growth. (For similar reasons, I use voter participation in presidential, rather than purely local, elections.)

The empirical implementation follows (26) except that an index is the proxy for "ability" instead of a single variable. Specifically,

$$\text{ABILITY} = \text{ED} + c_1 \text{VPAR} + c_2 \text{FARM} + c_3 \text{LABOR}, \quad (27)$$

where the c_i are weights, measured as fractions of the weight on ED, and VPAR = ratio of votes cast in the 1940, 1944, and 1948 presidential elections to the population over twenty-one in each state.

FARM and LABOR equal the ratio of membership in farm cooperatives and labor unions respectively to the population of the state.⁶¹ When (27) is substituted back into (26), we get

$$g = [a \cdot \text{ED} + \sum a \cdot c_i A_i] + b_0 \cdot \text{INEQUALITY} \\ + [b_1 \text{ED} \cdot \text{INEQUALITY} + \sum b_1 c_i A_i \cdot \text{INEQUALITY}] + X, \quad (28)$$

where A_i are the three additional components of the ability index. The resulting overidentified scheme is then estimated by nonlinear least squares, where the restrictions in (28) (that the c_i in the two bracketed expressions be the same) are imposed. To facilitate comparisons, ED and the A_i are each entered as standardized variables with the mean equal to 100 and standard deviation equal to 10. Thus $c_1 = .5$ would mean that if VPAR is one standard deviation above the mean, ability is enhanced by half as much as if ED is a standard deviation above the mean.

The results, for two forms of the dependent variable, the 1942–1972 average level and 1942–1972 change, are summarized in Table 15. There is another substantial improvement in explanatory power and in the precision of the ability and inequality coefficients. Our confidence in the crucial result of Table 14—that ability and within-group inequality interact negatively—is clearly strengthened by Table 15. In addition, the role of the wealthiest citizens as tempting targets for taxation seems better defined here than in

⁶¹ To avoid distortion by one-party dominance in the South in the 1940s, I calculate VPAR for the 1968 election for the southern states. I then multiply the ratio of VPAR in a state to the national average in 1968 by the national average for the 1940 elections to get estimates of the "true" VPAR in the South for those years.

Data on membership in labor unions and farm cooperatives are unavailable for the early 1940s, so I use the earliest available dates (1960 for cooperatives and 1964 for unions). All data are from Statistical Abstract.

Table 14; the coefficient on SH5 is consistently positive. All this is compatible with the notion that changes in the political process, as well as in personal capabilities of voters, play a role in the growth of government. But the nature of this role seems peculiar. The role of organized interest seems generally weak, statistically and numerically. The one exception of the large and significant impact of farm cooperatives on the level of government (column (2)) does not carry over to the change (column (4)). The unexpected result of a consistent and strong *negative* effect of voter participation on expenditures deserves more study than I can give it here. It is broadly consistent with certain nineteenth-century historical facts. Recall that Britain had a rapidly expanding franchise in the nineteenth century, while the United States did not, and apparently experienced a sharper contraction in the size of government. The result is also consistent with the spirit of bureaucratic-monopoly models, such as Niskanen's or Peacock and Wiseman's,⁶² which have at their core the notion of government expansion being antithetical to the interest of the broad mass of citizens. Our result implies that when the masses indicate they have sufficiently overcome their "rational ignorance" to come to the polls, the political process pays more heed to their interest.

There would then remain the question of just whose interest the political process is serving. It could not plausibly be just the bureaucracy's, given the empirical importance of broad measures of education and income equality. But our theory does not require that everyone in a specific income-education range be a beneficiary either. In fact, the technology of government, in which benefits are conferred through specific programs, rather than per capita grants, pretty much rules this out. One plausible interpretation of Table 15 is that government expands when specific programs attract a sufficiently broad constituency, but this constituency is always smaller than a majority of voters. However, a bigger potential coalition is better than a smaller one, and the chances for forming a successful coalition would be greater the larger the pool of voters who are prime potential beneficiaries. In our analysis, the size of this pool is larger the more educated voters with similar economic interests there are.

I now address the issue of the quantitative, as opposed to the statistical, significance of the ability-inequality nexus uncovered in Tables 14 and 15. Specifically, do the results explain any substantial part of the recent growth of government, or are the ability-inequality effects merely a sideshow on how spending is distributed among locales? This question is relevant for two reasons. First, even if ability, inequality, and their interaction help explain variation in the size and growth of local government, we have already noted there is not much variation to explain. Since the similarity among states is

⁶² Niskanen, *supra* note 3; and Peacock & Wiseman, *supra* note 1.

more notable than their differences, our regression can be measuring empirically trivial deviations from an all-important average. Second, the results imply that changes in inequality or ability, standing alone, have no clear-cut empirical implications for the size or growth of local government. This is most clear in Table 13 and confirmed by measuring the partial effects of either inequality or ability in Table 14 or 15 at the sample means (they are essentially nil). The issue of empirical significance thus rests on the importance of the interaction effect when there are substantial changes in *both* inequality and ability. Even at this level, the issue has no clear *a priori* answer. The differential form of (26) is

$$\Delta g = \Delta \text{ABILITY} [a + b_1 \cdot \text{INEQUALITY}] + \Delta \text{INEQUALITY} [b_0 + b_1(\text{ABILITY} + \Delta \text{ABILITY})]. \quad (26')$$

Since we find $a, b_0 > 0$ and $b_1 < 0$, there is no obvious prediction even for the direction of Δg .

To get at the empirical import of the results, I use the coefficients in Tables 14 and 15 to estimate the effects of the sorts of changes that have characterized the relevant history, namely an increase in education or ability coupled with a decrease in income inequality. Specifically, for Table 14 I ask: what is the predicted effect on the level (column (1) is the relevant regression) or the change (column (6)) in the size of government if education increases two standard deviations while inequality (SD2095 and SH5) decreases two standard deviations from the sample mean: The effect on the level is +4.28 percentage points and on the change +6.57 percentage points. For Table 15, we can perform a similar exercise in which the ability index, is also increased by two standard deviations. The results are +8.05 for level and +7.36 for change.

There are three points to note about these results.

1. The effects are substantial by any measure, running between 2.6 and 5.5 times the relevant regression standard errors. The effects on the level are between 30 and 60 per cent of the sample mean, and on the change about 60 or 70 per cent of the mean. Put differently, the level regressions purport to describe the change over the fifteen years from 1942 to 1957, while the change regressions pertain to 1942-1972. The 1942-1957 actual change is around +6.0 and the 1942-1972 change around +12.0. If our simulated ability-inequality changes accurately describe what went on in the interwar period, the regression parameters account for over half of the subsequent growth of government.

2. Our simulation roughly corresponds to the relevant historical change. For example, the simulated change in education is a little less than +2 years. Whereas we do not have pre-1940 data on ED, we know that mean schooling has been rising at over one year per decade subsequently (from 8 1/2 years

in 1940 to over 12 in 1970). We also know that prior to World War I no more than 5 per cent of seventeen-year olds were graduating from high school and that secondary school enrollment was also only 5 per cent of elementary school enrollment. So extrapolating the post-1940 experience back to around 1920, as done in the simulations, could not be far off the mark. Our assumed changes in inequality and the ability index are also reasonably accurate caricatures of the relevant history.⁶³

3. The driving force behind our results is the negative effect of the interaction between education-ability and inequality. The combination of increasing education-ability and decreasing inequality decreases their product and thereby accounts for the bulk of the historical growth in government that the cross-section results can rationalize. Consequently, considerable weight must be given to the confluence of these two forces, rather than to either separately, in any explanation of the growth of government.⁶⁴

D. *The Less Developed Countries (LDCs)*

The less developed countries (LDCs) pose a severe test of our model, perhaps too severe. Quite apart from the data problems, which are discussed subsequently, one can be skeptical whether the same processes that affect the size of government in the developed countries (DCs) carry over more or less intact to societies with markedly different economic and political structures. Yet the severity of the test is also an attraction, one that is enhanced by the diversity of the LDCs. While they differ on average from the DCs in most measures of political and economic development, they also span a much wider range—from countries with living standards only moderately below the DCs to those with virtually all the population in subsistence

⁶³ For SD2095 and SH5 our simulations entail decreases of .16 and .06, respectively. The former roughly corresponds to the actual change between 1930 and 1950, so we may be overstating the pre-1940 change. The latter figure describes roughly what occurs between 1930 and 1942; this series is shown in Figure IV. We have almost surely understated the historical change in the ability index. The relevant history is a change of around +2 SD for ED and unionization, +1 for farm cooperatives, and 0 for VPAR. If we sum these changes with the weights in columns (2) or (4) of Table 15, we would get changes in the index of around +30 or +20, respectively. The simulations entail changes only two-thirds as large.

⁶⁴ I attempted unsuccessfully to replicate the results in Tables 14 and 15 for the developed country cross section. I first constructed an inequality index $= L + 6 \cdot \theta$ which seems to be roughly the weighting scheme implied by the regressions in Table 12. Then I constructed an ability index: a simple average of standardized indices of newspaper circulation per person over 25 and school attendance per person under 15. When these two variables and their interaction were entered in a regression like 10 in Table 12, none of the coefficients was significant. However, when the interaction term was dropped, both of the remaining variables had significant *negative* coefficients and the R^2 increased from .8 in Table 12 to about .9. This implies that the "ability" index may be improving our inequality measure: as in our state and local data, "ability" and inequality are negatively (-.5) correlated in this sample. If our ability measure is partly a proxy for inequality, detection of the interaction effect would be difficult, since inequality would interact with itself rather than with "ability."

agriculture, from democracies to dictatorships, from income distributions more equal than those in the DCs to inequality far exceeding any recorded in the DCs over the last century. This enormous diversity creates a special opportunity to clarify the relative impact of political institutions and personal "abilities" on the growth of government. So far we have been able to treat this issue only in the context of isolated events (for example, the advent of Japanese democracy) or fairly homogeneous populations (for example, education differences across American states).

The basic facts about the size of government in the LDCs can be summarized succinctly. They are neither as large nor growing as rapidly relative to GDP as those in the DCs.

1. In the sample we will analyze (42 LDCs in the decade 1960–1970), the average government/GDP ratio is 17.6 per cent, or about half that of our DC sample (see Table 2).

2. There is substantially more diversity among the LDCs, at least relative to the lower mean. The standard deviation of government/GDP for the LDCs is 5.1 per cent, which is comparable to that for the DCs, so the coefficient of variation is about double that of the DCs.

3. The average 1960–1970 growth in government/GDP in the LDCs tends to be smaller than for the DCs; the mean change (standard deviation) is +3.4 (2.2) percentage points.

This combination of small and slowly growing governments is somewhat reminiscent of the pre-1920 history of the Western DCs (and of Japan for most of the twentieth century). And the crude data on LDC income distributions seem compatible with the explanation offered for DC history. A within-group measure of inequality which we subsequently exploit is the ratio of eighth to third decile incomes. This exceeds 3, on average, for the LDCs versus 2+ for the DCs. (The same sort of difference holds for the upper tail: the average share of income for the tenth decile is 39 per cent for the LDCs and 25 per cent for the DCs.) But there is considerable overlap in the two samples, and, of course, much more than differences in income inequality distinguish them. So the crude consistency ought to be greeted cautiously. We are on even slipperier ground with the changes in inequality in the LDCs. The earlier history of the DCs, the more recent experience of Japan and Kuznets's elaboration of the conflicting implications of development for inequality are all we have to create a presumption that nothing like the pervasive shrinking of inequality in the DCs has gone on in the LDCs.

My strategy in analyzing the LDC data is to replicate the analysis of the U.S. state and local government data, thereby forcing a comparison between the most and least homogeneous samples. Analogues to the variables in (26) (namely, ABILITY, INEQUALITY) are required, thus entailing considerable compromise with the poor quality of LDC data. For example, while

TABLE 16
GOVERNMENT EXPENDITURES/GDP REGRESSIONS
42 LESS DEVELOPED COUNTRIES, 1960-1970

Form of Dependent Variable	1960-70 Average	1970	1970-1/2(1960)	1970-1960
Model	Complete Adjustment, 5 Years	Complete Adjustment, 10 Years	50% Adjustment, 10 Years	Indefinite Adjustment
Independent Variables	(1)	(2)	(3)	(4)
POP	-.28 .69	-.30 .67	-.17 .58	-.05 .20
MODERN	.18 2.61	.18 2.40	.10 1.88	.01 .21
MODERN 2	-.10 .93	-.10 .86	-.05 .69	-.01 .10
ABILITY	-.06 .56	-.04 .30	.01 .07	.05 .78
INEQUALITY	-.26 2.90	-.32 3.23	-.22 3.37	-.13 2.47
R ²	.54	.55	.54	.30
SE	3.66	4.08	2.72	2.08

Notes:

Definitions and Sources of Variables

Independent variables are derived from the 1960 and 1970 ratios $\times 100$ of current government revenue from domestic sources to GDP, from United Nations Yearbook of National Account Statistics (various years). Revenue rather than expenditures is used, because data on capital expenditures are sketchy and, where available, they imply that capital expenditures are financed mainly from current revenues. In the rare case where current expenditures exceeded current revenues, the former is used.

For some countries, either 1960 or 1970 government revenue data are unavailable. If data over an interval of at least 5 years are unavailable, the country is excluded. Otherwise, I computed the ratio of government revenue to government consumption in the first or last available year and multiplied government consumption in the terminal year by this ratio. In two cases (Israel and South Vietnam), I extrapolated the 1960-1966 growth in government/GDP to 1970 to eliminate the effects of post-1966 wars.

Independent Variables

POP: Log of 1960 population. Statistical Yearbook, *supra*.

ABILITY: Average of four indexes, each normalized to mean = 100, standard deviation = 10. The components are:

1) *Democracy*: An index of the "strength of democratic institutions" which ranges 0-100 from I. Adelman & C. T. Morris, *Society, Politics, and Economic Development: A Quantitative Approach* (1971) (hereinafter cited as AM). Their sample covers about three-fourths of mine. For the remainder (non-AM countries) I first regressed the AM index on a set of dummy variables which were based on my reading of each country's political history in *Political Handbook of the World*, 1975, (Arthur S. Banks ed. 1975).

(a) Degree of party competition: +1 if, ca. the early 1960s, a democratically elected parliament wielded effective political power; -1 if power was held by one person or party and rivals were outlawed; 0 for intermediate cases.

(b) Post-World War II history of party competition: +1 if a multiparty democracy had prevailed for the whole period; -1 if the country had always been a dictatorship; 0 if some party rivalry had occurred for some of the period.

(c) Press freedom: +1 if, up to the early 1960s, the press was largely free of government control; -1 if the press was government controlled; 0 for intermediate cases.

(d) Military coups: -1 if a military coup had been attempted since World War II; +1 if a military coup had never been attempted up to 1965; 0 for doubtful cases (for example, civilian disturbances with military participation).

(e) Coups in one-party states: -1 if a coup had not been attempted in a one-party state; 0 otherwise. The notion here is that military opposition to a dictator means more "democracy" than a totally unopposed dictatorship.

(f) Log of GDP per capita in 1963 in U.S. dollars, to capture any positive income elasticity of democracy. The regression ($R^2 = .7$) coefficients were then used to generate an estimate of the "democracy index" for non-AM countries.

2) *Freedom of Political Opposition and of Press*: Index from AM with estimates for non-AM sample from regression technique described above. The independent variables for the estimating regression are the same as above ($R^2 = .5$).

3) *Extent of Mass Communication*: Index from AM, for non-AM countries a regression estimate of the AM index is used. The independent variables in the estimating regression ($R^2 = .95$) were the logs of per capita newspaper circulation and radio ownership (from UNESCO, Statistical Yearbook, various years)—that is, the AM index is essentially a weighted average of newspaper and radio use.

4) *Literacy*: Percentage of population literate ca. 1960 (UNESCO, Statistical Yearbook, various years).

MODERN: Weighted average of two AM indexes: The level of modernization of techniques in (1) agriculture and (2) industry. The weights are the percentage of population in agricultural and nonagricultural sectors. For non-AM countries, a regression estimate of the AM index (on log per capita GDP, $R^2 = .6$) is used.

MODERN 2: *MODERN-MODERN* if this difference > 0 ; 0 otherwise.

INEQUALITY: This is an average of two standardized (Mean = 100, S.D. = 10) indexes based on:

1) *R83*, the ratio of the share of income in the 8th to the share in the 3rd decile of the income distribution. The main data source is Shail Jain, *Size Distribution of Income: A Compilation of Data* (World Bank, 1975), which gives decile share estimates for most published income distribution. Where possible, I use a national household distribution ca. 1960. (Alternatives in order of preference are national population, urban households, national income recipients. For the latter 0.3% is added to the 3rd decile share, because this was the average (significant) difference between income recipient and household 3rd decile shares where both are available for the same countries. No other similar difference among distributions was found.) For some countries data are from a similar, partly overlapping, compendium in Irma Adelman & Cynthia T. Morris, *Economic Growth and Social Equity in Developing Countries* (1973) (hereinafter cited as AM2). They provide five points on the cumulative income distribution, rather than decile shares. To estimate the relevant decile shares, I first regressed the logs of the shares in Jain on the logs of the five values in AM2 for the 16 cases where both summarize the same distribution ($R^2 > .9$, $SE < .05$ for both decile shares), then I used the regression coefficients as weights to estimate 3rd and 8th decile shares from the AM2 data for other countries. The Jain and AM2 data cover about three-fourths of our sample. For the remainder, I averaged available estimates of *R* for countries in the same region at roughly the same level of per capita GDP.

2) $\sqrt{t/(1-t)}$, where t = percentage of population in traditional agriculture, as estimated by AM. For non-AM countries, estimates are based on weights from a regression of the AM estimate (on the percentage of the population in agriculture and log per capita GDP, $R^2 = .8$). The sample comprises the following 42 countries:

Argentina	Nigeria
Barbados	Panama
Bolivia	Paraguay
Burma	Peru
Chile	Philippines
Colombia	Portugal
Costa Rica	Sierra Leone
Dominican Republic	Singapore
Ecuador	South Africa
Greece	South Vietnam
Guatemala	Southern Rhodesia
Guyana	Spain
Honduras	China (Taiwan)
India	Tanzania
Israel	Thailand
Jamaica	Togo
Jordan	Trinidad
Korea (Republic of)	Tunisia
Malaysia	Turkey
Malta	Uruguay
Nicaragua	Venezuela

there are published income distributions for most LDCs, there is none of the refinement of their conceptual differences as in the Lydall-Sawyer data for the DCs.⁶⁵ Nevertheless, I take from these raw data the ratio of income in the 70-80 percentile of the distribution to income in the 20-30 percentile (*R83*) as a proxy for "within-group" inequality. (See notes to Table 16 for

⁶⁵ Sawyer, *supra* note 47; Lydall, *supra* note 28.

details on this and the other variables discussed below.) In preliminary work, I also used the tenth decile share as a proxy for between-group inequality. Since this variable proved even less helpful than its analogue in the state and local data (SH5), none of the results reported here use it.

I supplemented R83 with the same sort of nonmonotonic transform ($\sqrt{x(1-x)}$) of the agricultural share of the population that proved useful in estimating U.S. income distributions and is suggested by Kuznets's work.⁶⁶ Here some facts about LDCs are useful. Most have substantial agricultural population shares (about 50 per cent on average), but they span virtually all of the relevant range. In addition, a large share of the typical LDC's farmers are in a "traditional" or subsistence sector where income differences with the rest of the economy are especially great. Accordingly, I use for " x " above the share of the population in this traditional sector as estimated by Adelman and Morris.⁶⁷ I then simply average indexes of this variable and R83 to construct an index of INEQUALITY (see below for refinements).

An ABILITY proxy for the LDCs should make use of the considerable variety of their political institutions as well as of relevant population characteristics. Therefore, I constructed an ABILITY measure which weights the two kinds of ability equally. "Political ability" is an average of two indexes constructed by Adelman and Morris of the "strength of democratic institutions" and of the "degree of freedom of political opposition and press."⁶⁸ These indexes contain large subjective elements but are at least independent of this study and may shed light on a major unresolved question: does more active representation of broad groups of potential beneficiaries ("democracy") stimulate the growth of government? Data on educational attainment, the personal-ability proxy used in Table 14, are too fragmentary to permit a direct analogue. Accordingly, I used an average of two proxies for personal ability, the fraction of the literate population and an Adelman-Morris index of the "effect of mass communication" (essentially a weighted average of newspaper circulation and radio ownership per capita).⁶⁹ The ABILITY measure is the average of the "political" and "personal" ability indexes.

My only substantive departure from the analysis of U.S. local governments is to add variables reflecting the level of economic development and, implicitly, tax collection costs. The motive is to use this diverse sample to elaborate on two aspects of the earlier data: Japan's atypical pre-World War I growth of government and the general absence among DCs and U.S. states

⁶⁶ See text at note 26 *supra*.

⁶⁷ Irma Adelman & Cynthia Taft Morris, *Society, Politics, and Economic Development: A Quantitative Approach* (1971). Data on income differences between sectors are unavailable.

⁶⁸ See *id.*

⁶⁹ In the subsample of countries where median schooling attainment is available, the simple correlation with either proxy is about .9.

of any correlation between per capita income and the relative size of governments. Taken together, these two factors seemed to imply that major income-related reductions in revenue-raising costs occur only fairly early in the development process. To verify the implication, I use two variables. One is an index of the extent to which the economy has adopted "modern" techniques,⁷⁰ which presumably entail monetary exchange, modern record keeping, and so forth and hence serve as a proxy for tax collection costs. The second is simply this variable less its sample mean for countries with above average modernization. If tax-collection-cost economies diminish with development, the first variable should have a positive partial correlation and the second a negative partial correlation with the size of government.

All of these variables are defined *circa* 1960 and are used to explain the size and growth of government in the subsequent decade, which is about as long a period as the data permit.⁷¹ Our sample consists of forty-two LDCs for which government budget data are available and which were substantively independent political entities around 1960.⁷² The analogues to the regressions in Table 13, which implement equation (24), are in Table 16. One notable difference from Table 13, where essentially nothing but population worked,⁷³ is the consistently negative correlation between inequality and either the size or growth of government. We also find a pattern of coefficients for the tax-collection-cost proxies (MODERN, MODERN 2) consistent with the hints in the Japanese, DC, and state data. That is, lower collection costs stimulate the growth of government (the coefficient of MODERN is positive), but at what appears to be a diminishing rate (the negative coefficient of MODERN 2 is insignificant). Table 16 duplicates the insignificant ABILITY effect of Table 13.

We learned from Table 14, however, to mistrust the too easy inference that effects of ability play no role in determining the size or growth of government. Accordingly, Table 17 implements the interaction model of

⁷⁰ This is a weighted average of two Adelman-Morris indexes, *supra* note 67: the "level of modernization of industry" and of agriculture, with urban-rural population shares as weights.

⁷¹ Pre-1960 budget data are unavailable for most LDCs, and the gaps and reporting lags get more serious the closer we approach the present. In addition, the sharp rise in oil prices post 1973 leads to major departures from trend for revenues of some of the governments in our sample.

⁷² That is, if the country was *de jure* a colony for a substantial part of the period, it had to have been granted at least local autonomy by around 1960 to be included in the sample. The *de facto ca.*-1960 status was determined from the country narratives in *Political Handbook of the World: 1975* (Arthur S. Banks ed. 1975).

⁷³ The role of population here is less clear-cut than for U.S. states. In the public goods framework, there are both "set-up-cost" and density economies, and among U.S. states population and density are positively correlated. However, in this sample the smallest entities include some of the most densely populated (Barbados, Malta, Singapore). I include the population variable here only for the sake of completeness.

TABLE 17
LDC GOVERNMENT/GDP REGRESSIONS, WITH
ABILITY-INEQUALITY INTERACTION

Form of Dependent Variable	Average, 1960-70	1970	1970-1/2 (1960)	1970-1960
Model	Complete Adjustment, 5 Years	Complete Adjustment, 10 Years	50% Adjustment, 10 Years	Indefinite Adjustment
Independent Variables	(1)	(2)	(3)	(4)
POP	.06 .16	.04 .09	-.00 .01	-.05 .19
MODERN	.18 3.06	.19 2.72	.10 2.03	.01 .21
MODERN 2	-.13 1.40	-.14 1.25	-.07 .93	-.01 .10
ABILITY	3.29 3.29	3.31 2.89	1.68 2.09	.05 .08
INEQUALITY	3.16 3.10	3.10 2.65	1.48 1.82	-.12 -.18
ABILITY \times INEQUALITY	-.034 3.37	-.034 2.93	-.017 2.09	-.001 .01
R ²	.65	.64	.59	.30
SE	3.23	3.71	2.60	2.11

Note: See notes to Table 16 for definitions and sources of variables.

equation (26) on the LDC data, yielding a remarkable consistency with the results for U.S. states in Table 14: (1) The ABILITY and INEQUALITY variables both tend to have significantly positive coefficients as in Table 14. (2) The interaction effect (coefficient of ABILITY \times INEQUALITY) tends to be significantly negative as in Table 14. (3) There is a substantial improvement in the fit of the Table 17 regressions over their Table 16 counterparts, again duplicating the pattern for U.S. states.

The only exception to these conclusions is in column (4) of Table 17, where the interaction model clearly fails to work. However, the indefinitely long adjustment process implied by column (4) seems to be an inappropriate characterization of the growth of LDC governments.⁷⁴ And this, too, appears

⁷⁴ We can use the same test as for the state data (see note 58 *supra*). Note that columns (2)-(4) of Table 17 purport to explain Government/GDP for 1970. When we compute the standard error of the value of this variable predicted by each of these regressions we get 3.70 for (2), 3.87 for (3), and 4.82 for (4). So (2) and (3) do about equally well in explaining the data, but (4) is clearly inferior. Column (1) describes a different dependent variable (1960-70 average). To compare that regression with the others, we compute the standard error of this regression after

reasonable. The rationale for a long drawn-out adjustment process is strongest when the determinants of the size of government have changed profoundly over a relatively short interval. This was true of the developed world, especially with respect to inequality, up to about 1950, but it is not obviously true of the LDCs. Although Table 17 does not permit pinning down the adjustment lag for the LDCs to anything closer than a five- to twenty-year range, it does rule out much longer lags. The LDCs thus appear to have adjusted faster to their smaller gap between actual and "desired" size of government than the DCs.

Finally, note that Table 17 is slightly more emphatic about the diminishing effect of tax collection costs. If we take the results for the MODERN variables at face value, they imply the marginal impact of "modernization" is only about one-fourth as great for the more developed LDCs as for the least developed. The implication for the historical experience is that Japanese government grew rapidly prior to World War I while Western governments did not, because Japan was then developing the sort of revenue-raising infrastructure that the others had achieved much earlier.

The results in Table 17 raise two questions:

(1) What is the relative importance of political ability (democracy, and so on) and personal ability (literacy, and so on)? An attempt to use the technique of Table 15 failed for the LDC data.⁷⁵ However, experimentation with different weights on the "political" and "personal" components of the ABILITY index revealed that both are important and that it is tolerably accurate to give them equal weight.⁷⁶ So these LDC results are consistent with both the Japanese results, which isolated a political ability effect (the shift to democracy), and the U.S. state results, which isolate personal ability effects (education).

adjusting the dependent variable to the same mean and variance as the 1970 variable. This turns out to be 3.93, or about the same as for (2) and (3).

⁷⁵ In an attempt to estimate the weights of the components of ABILITY and INEQUALITY, the nonlinear-least-squares regression failed to converge.

⁷⁶ For example, consider the following weighting schemes for the political (average of "democracy" and "freedom" indexes) and personal (average of "literacy" and "mass communications") components and the resulting R^2 s for regressions otherwise identical to (2), Table 17.

ABILITY =		
j POLITICAL + k PERSONAL		R^2
$j = 0, k = 1$.607
$j = 1/4, k = 3/4$.628
$j = 1/2, k = 1/2$ (as in Table 17)		.644
$j = 3/4, k = 1/4$.648
$j = 1, k = 0$.641

They suggest only that very low weights on the political variables are inappropriate. I conducted a similar exercise for the components of INEQUALITY (see note to Table 16). Here, too, nothing much improved on the equal weighting in Table 17, and only low weights on the $R83$ component could be ruled out.

(2) Is the ability-inequality nexus important empirically? The LDC data suggest an even more positive answer than the state data. One useful formulation of the problem is to see if the results in Table 17 can rationalize any of the substantial difference in size of government between LDCs and DCs. Recall that the average DC government sector spends fully twice as large a fraction of GDP as the average LDC government. Therefore, I plugged values of the independent variables appropriate to the DCs into Table 17 regressions to obtain estimates of what the size of the average LDC government sector would be if these countries had the characteristics of DCs.⁷⁷

For regression (1) Table 17, the results of this exercise were:

1) Average government/GDP, 1960-70, for LDCs	17.62%
2) Predicted change, if LDC industry became as modernized as DCs (MODERN = 100, MODERN 2 = 42)	+3.55
3) Predicted change, if LDC ABILITY and INEQUALITY = DC average	+12.49
4) Predicted government/GDP for LDC with DC characteristics (1 + 2 + 3)	33.7%
5) Actual average for 16 DCs, 1960-70	33.4

For regression (2), which describes 1970 data, the counterparts to lines (1), (4), (5) above were:

1) Average government/GDP, LDCs, 1970	19.2%
4) Predicted 1970, DC characteristics	36.9
5) Actual average, 1970, DCs	36.7

(The relative magnitudes of the counterparts to lines (2) and (3) were roughly the same as above.)

The essential result is that we are able to rationalize *all* of the differences between DCs and LDCs, virtually to the decimal point. These remarkable⁷⁸ results suggest that the large behavioral differences between these two groups are really the outcomes of precisely the same process, one which is dominated by the ability-inequality nexus (compare lines (2) and (3) above).

⁷⁷ Specifically, the characteristics assumed for a DC are: (1) A fully modernized industrial structure. MODERN = 100. (2) A democratic society with no restraints on opposition or the press, that is, "democracy" and "freedom" indexes = 100. (3) A fully literate society. (4) A "mass communications" index as implied by the AM index and the average values of radio ownership and newspaper circulation for the DC sample of Table 12 (see note to Table 16). This index = 106. (5) A nominal .01 share of the population in subsistence agriculture. (6) The average value of *R83* for the DCs in Sawyer's data (*supra* note 47).

⁷⁸ There is one catch. The predicted values, line (4), are for an *equilibrium* size of government. But our analysis of DCs suggested that the *actual* values around 1970 or 1965 were *subequilibrium*.

If that is so, there are some strong implications for the future growth of government in the LDCs. As (if) the LDCs' overall level of economic development, their degree of income inequality, and the "personal" characteristics of their populations approach those of contemporary DCs, the recent slow growth of LDCs' government sectors will accelerate. Whether the gap between them and contemporary DC governments closes completely depends on political developments that are difficult to predict. If there is no corresponding move toward more democratic political institutions at all, a nontrivial gap will remain.⁷⁹

VI. CONCLUDING REMARKS

The broad conclusion to which our diverse data point is that governments grow where groups which share a common interest in that growth *and* can perceive and articulate that interest become more numerous. The view that sharp differences are (should be?) an important source of government sponsored redistribution seems to carry less weight. Our results do detect a stimulative role of inequality but only where the population is least capable of articulating support for more government spending.⁸⁰ As this capability increases, homogeneous interests become a more important source of government growth. Our results imply that the *leveling* of income differences across a large part of the population—the growth of the "middle class"—has in fact been a major source of the growth of government in the developed world over the last fifty years. On our interpretation, this leveling process, which has characterized almost every economically developed society in the latter stages of industrialization, created the necessary conditions for growth of government: a broadening of the political base that stood to gain from redistribution generally and thus provided a fertile source of political support for expansion of specific programs. At the same time, these groups became more able to perceive and articulate that interest (as measured by, for example, educational attainment). On our interpretation, this simultaneous growth of "ability" served to catalyze politically the spreading economic interest in redistribution.

The counterintuitive result that, on balance, more equality breeds a political demand for still more income equalization runs through virtually all our data and proves capable of rationalizing a wide variety of experience—for example, why Britain's government declined in the early nineteenth century

⁷⁹ If one carries out the extrapolation above keeping the levels of "democracy" and "freedom" at the LDC sample mean, the predicted size of government is on the order of 5 percentage points less than on line (4).

⁸⁰ In both the U.S. state and LDC data, the net effect of more inequality on the size of government is positive only at below average levels of ability.

and grew in the twentieth, why Sweden's government has grown faster than ours, why the developed world has larger and more rapidly growing government sectors than the underdeveloped. The role we assert for "ability" as a catalyst for equality-induced growth also has a broad base of support, and the concept appears to comprehend attributes of both the political system and its constituency. We were able to see the catalyzing process at work in Japan, when it became a democracy, in the U.S. states with above average levels of education, and in less developed countries that were both more democratic and had better educated populations than is typical of that group. It is, in fact, the enormous diversity of experience that the ability-equality nexus proves capable of rationalizing, rather than any single result, that provides the main empirical message of this paper. This common process seems capable of rationalizing a substantial part of the differences among and between constituencies as diverse as local school boards, European welfare states, and traditional agricultural societies.

A caveat is in order, lest my conclusion be read as implying that all or even most members of groups which contribute support to growth of government have benefited from that growth. The "bourgeoisification" of Western societies widened the political base from which support for expansion of government could be drawn. But the particular programs that expand will, at least in each instance, benefit a subgroup. It is at least arguable, and compatible with "rational ignorance" in politics, that the net result is for a minority of the population to receive large per capita net benefits at the expense of the majority. Our one result relevant to this issue—that large voter turnout retards the growth of government—tends to support this view.

If the foregoing analysis is correct, it points to a future somewhat different from the recent past. In developed countries, the leveling process in the labor market has been far more gradual in the last quarter century than the preceding. At the same time, the scope for increased educational attainment of their population, at least in the United States (and Canada, Australia, and—to some extent—Britain) has narrowed. A high school education has become the norm, and the waves of the unschooled immigrants who produced the high school and college graduates of a subsequent generation have long since crested. If the twin forces of increased equality and increased education are indeed petering out, our analysis implies that the pressure for further growth of government is likely to abate in the developed world. It would be imprudent to try to be precise about this prediction, especially in light of our evidence that these forces can take considerable time to work themselves out and of our lack of success in pinning down just how long it is before they are spent. Nevertheless, it would be fair to infer from the evidence here that the next quarter century will witness a perceptible, perhaps substantial, deceleration of the relative growth of government in the devel-

oped world. If anything, this ought to be more profound in the United States than in Continental Europe, where there still may be some scope for the spread of education. The one exception is Japan, where the emergence of a broad middle class as a concomitant of a mature industrial economy seems to be a comparatively recent phenomenon, and where, in consequence, we are led to predict a narrowing in the gap between the size of its government sector and that of the Western democracies. With less confidence, we can also predict a narrowing of differences between the developed and less developed worlds.

The larger message of this paper is that there is nothing inevitable or inexorable about the growth of government, nor is there some arbitrarily limiting ratio of government to GNP.⁸¹ Instead, our argument is that the size of government responds to the articulated interests of those who stand to gain or lose from politicization of the allocation of resources. The balance of those interests can make for declining governments, as they appear to have done in the last century, as well as for the growth we have experienced more recently.

⁸¹ Not even 100 per cent. Government transfers, for example, can be taxed, retransferred, retaxed, and so on, so that the annual government budget can be a multiple of GNP. In fact, this ratio exceeds 1 in Israel currently.