CHAPTER 22

Government size and economic performance

> I sit on a man's back, choking him and making him carry me, and yet assure myself and others that I am very sorry for him and wish to lighten his load by all possible means – except by getting off his back.
>
> Leo Tolstoi

In the previous chapter we documented how governments have grown around the world – until in Europe; they now generally absorb half the national income or more. What have been the consequences of this growth for the welfare of the citizens of these countries? What have been the consequences for the economic performance of the countries? The first question is, of course, the most relevant one. Since the end of World War II, the United States has spent over $8 trillion on defense. If these expenditures prevented a third world war, led to the collapse of Communism in East Europe and the Soviet Union, and thereby preserved democracy and freedom in the West, most Americans would probably say that the money was well spent. But if the same events would have transpired if the United States had spent only a tenth as much on defense, then more than $7 trillion would have been wasted, and Americans are that much worse off as a result.

The very "nonmarket" nature of many of the goods and services government supplies makes it difficult to measure their effects on welfare. One can measure the amounts of money given out as unemployment compensation and social security payments, but how does one measure the peace of mind to all of those who were not unemployed and yet did not have to fear unemployment because of the existence of unemployment benefits? How does one measure the peace of mind of knowing that one will not live in poverty in one's old age?

Economists and public choice scholars have not tried to answer these questions. Just as in the political business cycle literature they have focused on the *economic* causes of government popularity; they have focused on the economic consequences of government growth or size. Although these include only a small portion of the welfare effects of government, they constitute important components of performance and ones which we can measure with some accuracy. In this chapter we examine some of these consequences. We begin at the microlevel and work our way up to the macrolevel.

22.1 The welfare losses from taxation

All taxes, with the exception of the much discussed but seldom used lump-sum tax, distort individual behavior and reduce welfare as a result of these distortions. Consider first the case of a commodity tax. In Figure 22.1a the compensated demand schedule for commodity x is depicted. It is produced with constant marginal costs, c, and under perfect competition. In equilibrium, x_c units are sold at a price of P_c. Now let the government introduce a commodity tax of t_1 per unit. Price rises by this amount, the government takes in the long rectangle between t_1 and P_c in tax revenue, and consumers suffer the additional loss in consumers' surplus on the units of x not purchased as measured by triangle L_1. The welfare loss triangle is small relative to the tax revenue raised.

The maximum tax revenue that the government can raise from this commodity tax occurs at the tax t_m, where the price of the commodity including the tax has risen to the profit-maximizing price of a monopolist. The government takes in the rectangle R_m falling between the t_m and P_c lines. The welfare loss from the distortionary effect of this tax has now risen to L_m, however, and equals half of the revenue from the tax. The welfare loss from taxation rises relative to the revenue from the tax as the tax increases.

To see this relationship more clearly, let us examine the algebra involved. The compensated demand schedule for x can be written as

$$P = a - bx. \tag{22.1}$$

With perfect competition price equals marginal costs,

$$P_c = c = a - bx, \tag{22.2}$$

yielding a competitive output x_c:

$$x_c = \frac{a - c}{b}. \tag{22.3}$$

Adding the tax t we obtain the output x_t:

$$x_t = \frac{a - (c + t)}{b}. \tag{22.4}$$

The tax revenue raised by the state equals this output times the tax:

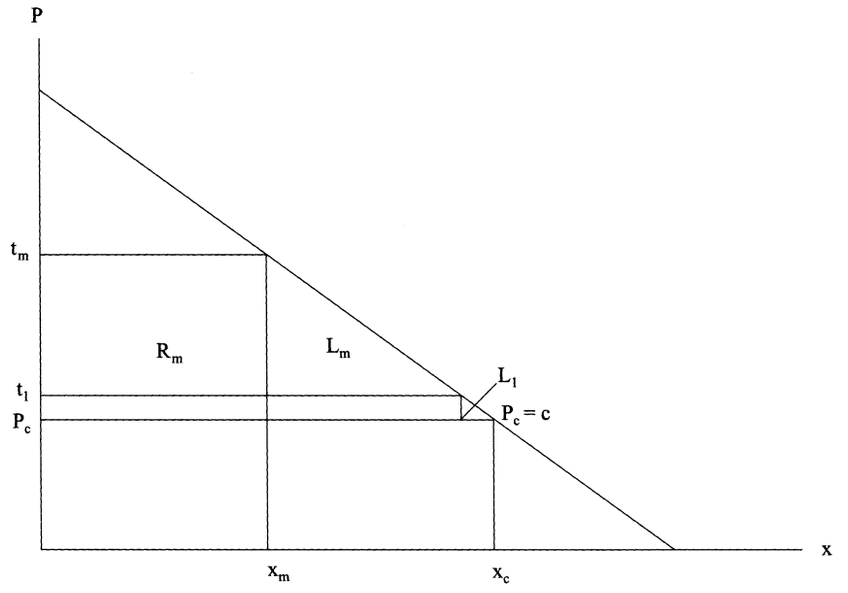
$$R = \frac{a - (c + t)}{b} t = \frac{(a - c)t - t^2}{b}. \tag{22.5}$$

Maximizing (22.5) with respect to t, we obtain the tax t^* that maximizes tax revenue

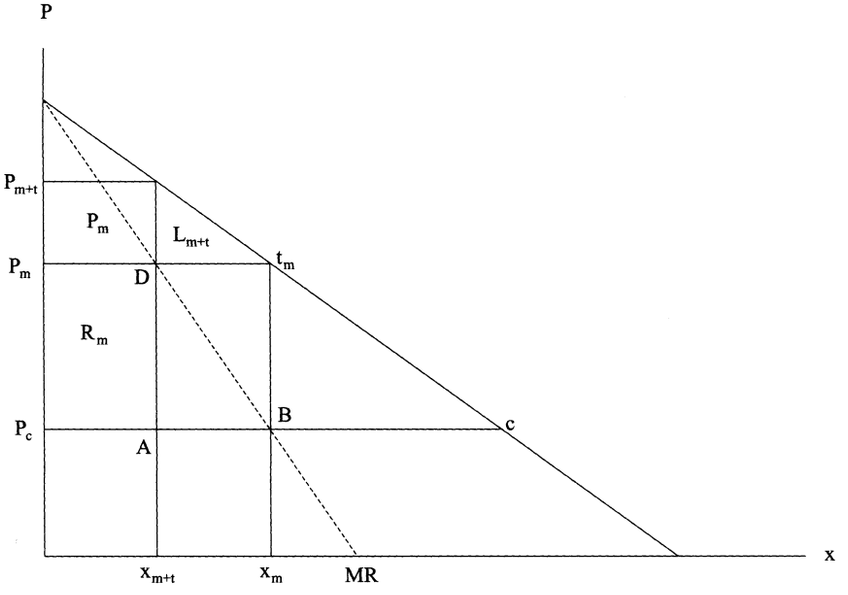
$$t^* = \frac{a - c}{2}, \tag{22.6}$$

which yields the maximum tax revenue of

$$R^* = \frac{(a - c)^2}{4b}. \tag{22.7}$$



(a)



(b)

Figure 22.1. The distortionary effects of taxation.

The welfare loss from taxation is one-half the change in output caused by the tax times the tax. The change in output caused by the tax is

$$\Delta x_t = \frac{a-c}{b} - \frac{a-(c+t)}{b} = \frac{t}{b} \tag{22.8}$$

with the welfare loss thus being

$$L = \frac{1}{2}\frac{t}{b}t = \frac{t^2}{2b}. \tag{22.9}$$

The revenue raised from the tax is a quadratic function of t which reaches a maximum at t^*, while the welfare loss from the tax grows exponentially with it.

Assuming that the government does not charge a tax *greater* than that which maximizes tax revenue, the welfare loss from taxation is at most half of the tax revenue raised with a straight line demand schedule *and* perfect competition in the supply of x. The welfare loss from taxation increases, however, if the suppliers of x possess market power.

Assume now that x is sold by a monopoly. Absent any tax it equates marginal revenue and marginal cost and sells x_m at the price P_m, where

$$x_m = \frac{a-c}{2b}. \tag{22.10}$$

The monopolist's profit-maximizing output is

$$x_{m+t} = \frac{a-(c+t)}{2b}. \tag{22.11}$$

The state's tax revenue is now

$$R = \frac{a-(c+t)}{2b}t = \frac{(a-c)t - t^2}{2b}. \tag{22.12}$$

Maximizing (22.12) with respect to t, we obtain the exact same t^* that we did before,

$$t^* = \frac{a-c}{2}. \tag{22.6}$$

This yields a tax revenue for the state, however, which is only one-half of that raised when x is supplied competitively, because the monopolist still chooses to maximize its profits, and thus supplies only half of the output with the revenue-maximizing tax as would be supplied under perfect competition.

$$R^*_{m+t} = \frac{(a-c)^2}{8b} \tag{22.13}$$

$$x_{m+t} = \frac{a-\left(c+\frac{a-c}{2}\right)}{2b} = \frac{a-c}{4b}. \tag{22.14}$$

This can easily be seen in Figure 21.1b. The monopolist charges price P_{m+t} with the tax and sells x_{m+t}. The government's tax revenue is the rectangle R_m. The welfare loss from the tax now *exceeds* the revenue it raises, however. This welfare loss equals the rectangle ABt_mD, which represents the profits that the monopolist would have earned on units of x that now go unsold as a result of the tax, plus the consumers' surplus triangle, L_{m+t}, on these unsold units. As R_m equals ABt_mD, the welfare loss exceeds the tax revenue by the triangle L_{m+t}.

Of course, these results for monopoly constitute an upper bound on the losses from a commodity tax, just as the results for perfect competition constitute a lower

bound. Most industries fall in between these two extremes. The results indicate, however, that the welfare losses from taxation can become relatively large when the government attempts to maximize its revenue from the tax, and are larger, the larger the market power enjoyed by firms subject to the tax.

A commodity tax creates a welfare loss by distorting a consumer's pattern of consumption. General commodity taxes distort choices between consumption and leisure; income taxes distort choices between work and leisure; and so on. All taxes in common use lead to some distortions in choices and losses in welfare.

Of particular interest in this regard are the distortionary effects of income taxes. Browning (1987), using an analysis similar to the one employed here but with respect to the supply of labor, has calculated a range of possible *marginal* welfare losses from income taxes in the United States of from roughly 10 to over 300 percent, depending on the assumptions made about the elasticity of the labor supply curve, the effective tax rate, and so on. Browning's "preferred estimates" based on the plausibility of the assumed parameters range from 31.8 to 46.9 percent.[1]

These estimates imply a rather substantial welfare loss on the margin from the taxation of income in the United States. Given that labor and income from labor is much more heavily taxed in Europe than it is in the United States, and that welfare losses increase exponentially with the tax rate, the marginal welfare losses from taxes on labor in Europe must be substantially higher. Alesina and Perotti (1997) have not measured welfare losses in the same way that Browning does, but they nevertheless find a very significant distortionary effect from taxes on labor. Taxes on labor significantly increase labor costs causing higher unemployment and an overall loss in competitiveness for a country.

22.2 Government size and black market activity

The previous section demonstrated how taxes reduce economic efficiency and social welfare by distorting choices among consumption goods, between work and leisure, and so forth. Taxes and other forms of government intervention and regulation can, however, have other distortionary effects. Rather than working less to avoid paying income taxes, for example, people may simply *report* less income. In the United States roughly 17 percent of the potential revenue from the federal income tax is lost because of this form of tax evasion (Andreoni, Erard, and Feinstein, 1998, p. 819).

More generally, taxes and regulations can affect the choice between conducting an activity in the "legitimate economy" and conducting it in the "underground economy." The underground economy includes both legitimate activities, like hiring someone to paint an apartment, that go unreported, and illegal activities, like the purchase of cocaine. The underground economy has been called the shadow economy, the informal sector, the irregular sector, the unreported sector, the black or gray economy (market), and, for some activities, the illegal or criminal sector.[2] The economic activity described by these terms is underground in the sense that the

[1] Additional estimates of similar magnitude have been made by Stuart (1984) and Ballard, Shoven, and Whalley (1985). Ng (2000) argues, however, that these sorts of estimates are too high.

[2] See discussion in Feige (1989b) and Thomas (1992).

persons engaged in it, both buyers and sellers, try and conceal the activity from the government. They do this to avoid having to obtain any licenses that are needed to engage in the activity, to avoid regulation, and to avoid paying taxes.

When economic activity is driven into the underground economy, there can be several adverse effects on economic efficiency:

1. Going underground brings with it its own distortions. For example, buyers of merchandise in the black market may have to travel greater distances to make their purchases, devote more time to the transactions, and may not receive goods of the same quality and be accorded the same warranty protection that accompanies goods purchased from legitimate businesses. When safety and environmental regulations are circumvented by going underground, social welfare is reduced through the greater risks consumers or employees bear, or by the environmental damage done.
2. The state loses the tax and license revenue that it could have collected. This loss may force the state to set higher tax rates or to introduce additional taxes to cover its expenditures leading to more distortions and driving more activity underground.
3. Because the scale of the underground economy is difficult to measure, those in government may make erroneous judgments about economic policies based on the figures for the legitimate economy. Suppose, for example, that heavy income and social insurance taxes lead some people who are unemployed to work in the underground economy. They continue to pretend to look for work so as to be able to claim unemployment benefits, but refuse to take jobs offered to them, so long as the net of tax income from a job in the legitimate sector is less than the unemployment benefits plus the tax-free income in the underground economy. These people can truthfully be said to be "voluntarily unemployed." Official unemployment figures overestimate the number of people actively seeking employment, and government policies to reduce official unemployment are likely to be less effective than the designers of these policies anticipate.
4. Each person who participates in the underground economy is breaking a governmental law or regulation, and perhaps certain mores of the community. Once a person breaks one law and "gets away with it," she may be tempted to break others. Thus, one set of illegitimate activies in the underground economy may encourage others, and the legal and moral fabric of a community will be harmed.

How big is the underground economy? This obvious and basic question is, unfortunately, very difficult to answer. The fact that it is underground or in the shadows makes it difficult to observe and to measure its size. Several approaches have been tried. The simplest is to ask people directly. Many surveys have been conducted that, for example, ask people to report the amount of income that they earn that must be or is reported to the government and how much is not reported. One expects that some people may be reluctant to admit that they conceal income from the government – even in a survey where anonymity is promised – and thus that there is

a downward bias in the estimates of the size of the underground sector using survey data. This downward bias is likely to be particularly large for activities for which there is strong social approbation or large legal penalties, for example, questions about the purchase or sale of illegal drugs. Not surprisingly, therefore, estimates of the size of the underground economy based on surveys tend to be the smallest of all of the procedures used.

The most frequently used method for estimating the size of the underground economy tries to identify an easily observed and measured activity or commodity that is complementary to economic activity in both the above- and underground economies. Money might be such a commodity, for example. Let us assume that the quantity theory of money holds, and thus that the demand for money balances can be written as $M = kY$, where M stands for money balances, Y for gross domestic product, and k is a constant representing the amount of money balances people wish to hold relative to the level of economic activity that they carry out. Let us assume now that at some past point in time, $t - n$, we believe that the size of underground economy was zero, but at time t it is positive. We further believe that the k for transactions in the aboveground economy is the same as for the underground economy, and that k is the same in t as it was in $t - n$. Data for the gross domestic product (PT) and money balances in period $t - n$ can then be used to estimate k. Given this estimate of k and the level of observed money balances in t, we can predict what gross domestic product is in t. This will be an estimate of the size of the official and underground economies combined. The difference between this figure and the offical government estimate of GDP is a measure of the size of the underground economy.

There are several possible ways in which this estimate may be in error.[3] The underground economy may not have been zero in $t - n$,[4] k may differ between the two sectors, k may change over time, and so on. Thus, other proxies have been tried.

One popular choice is the consumption of electricity. Electricity is a basic input to many production and consumption activities, and its consumption is easy to measure. If E_t is the amount of electricity consumed at time t, and Y_t is gross domestic product at t, then electricity consumption can be reasonably accurately predicted by the equation, $E_t = kY_t$. The electricity-consumption approach then proceeds like the demand-for-money-balances approach. The parameter k is estimated at a point in time, $t - n$, when the underground economy is thought to be of size X, where X might equal zero. The consumption of electricity at time t is then used to predict Y_t, assuming that k has not changed. The difference between the gross domestic product predicted from the use of electricity and the official GDP is the measured size of the underground economy.

The electricity-consumption approach has also been critized. Schneider and Enste (2000) discuss the merits and faults of nine approaches that have been tried. We shall not review each approach. Suffice it to say that they yield a broad range of estimates, with household surveys producing the smallest estimates, and variants on

[3] See Porter and Bayer (1989) and Schneider and Enste (2000).

[4] One might employ the procedure and assume some nonzero value for the underground economy in $t - n$, but the estimate for t would still be sensitive to this assumption.

Table 22.1. *Average size of the underground economy in developing, transition, and OECD countries*

Countries	Ranges of the size of the underground economy, 1990–3
Developing countries	
Africa	39–76% of GDP
Central and South America	25–60% of GDP
Asia	13–70% of GDP
Transition countries	
Former Soviet Union	20–43% of GDP
Central Europe	9–28% of GDP
OECD countries	8–30% of GDP

Note: Estimates based on electricity or currency demand approaches.
Source: Schneider and Enste (2000, Table 2).

the demand-for-money approach producing the largest estimates. Estimates of the size of the underground economy as a percent of GDP for Canada in the late 1980s range, for example, from 1.4 percent based on a household survey to 21.2 percent using the transactions approach.[5] Similarly, wide ranges of estimates are reported for Germany, Great Britain, Italy, and the United States (Schneider and Enste, 2000, Table 8).

Despite these large differences across the various approaches, two conclusions can safely be drawn from the existing literature. The first is that the relative size of the underground economy is much larger in developing and transition economies than in the developed countries. Table 22.1 presents ranges for the three groups of countries. The underground economies in the developing countries of Africa, Asia, and Latin America average to roughly 40 percent of total GDP, while in the OECD they average only around 15 percent of GDP. Estimates for the transition countries fall midway between these two figures.

The second conclusion that can safely be drawn is that the underground sectors have been growing. Table 22.2 presents estimates of the size of the underground economy in several OECD countries at different points in time.[6] In each of the 15 countries, the underground economy has grown. In Norway and Sweden it has grown from an insignificant 1 to 2 percent of GDP in 1960 to around 18 percent of GDP in 1994. In only 3 of the 15 countries – Austria, Switzerland, and the United States – was the underground economy estimated to be less than 10 percent of GDP in 1994. The highest estimate was over 25 percent for Italy.

These figures suggest the same two questions that we tried to answer about the size of the government sector in the previous chapter. What accounts for the relative growth in size of the shadow economy, and what accounts for the wide dispersion of estimated sizes across countries?

[5] This approach uses the variant on the quantity theory of money, $MV = PT$, where M stands for money balances, V for the velocity of money, P for prices, and T for transactions. The size of the shadow economy is estimated by comparing actual and predicted levels of T.

[6] Table 22.2 is taken from the working paper version of Schneider and Enste (2000) because it contains more countries and data points.

Table 22.2. *Estimates of the size of the underground economy in selected OECD countries, 1960–94*

	Currency demand approach Size of the underground economy (as % of official GDP) in the years						
Countries	1960	1970	1975	1978	1980	1990	1994
Austria	0.4	1.8	1.9	2.6	3.0	5.1	6.8
Belgium	–	10.4	15.2	–	16.4	19.6	21.4
Canada	–	–	5.8–7.2	–	10.1–11.2	13.6	14.6
Denmark	3.8–4.8	5.3–7.4	6.4–7.8	6.7–8.0	6.9–10.2	9.0–13.4	17.6
Germany	2.0–2.1	2.7–3.0	5.5–6.0	8.1–9.2	10.3–11.2	11.4– 12.0	13.1
France	–	3.9	–	6.7	6.9	9.4	14.3
Ireland	–	4.3	6.9	–	8.0	11.7	15.3
Italy	–	10.7	–	–	16.7	23.4	25.8
Netherlands	–	4.8	–	–	9.1	12.9	13.6
Norway	1.3–1.7	6.2–6.9	7.8–8.2	9.6–10.0	10.2–10.9	14.5–16.0	17.9
Spain	–	–	–	18.0	–	21.0	22.3
Sweden	1.5–1.8	6.8–7.8	10.2–11.2	12.5–13.6	11.9–12.4	15.8–16.7	18.3
Switzerland	1.2	4.1	6.1	6.2	6.5	6.6	6.9
United Kingdom	–	2.0	6.5	7.8	8.4	10.2	12.4
United States	2.6–4.1	2.6–4.6	3.5–5.2	3.7–5.3	3.9–6.1	5.1–8.6	9.4

Source: Schneider and Enste (1998, Table 3.3.2).

When deciding whether "to go underground" the rational actor must trade off the benefit from operating in the underground economy versus the potential cost, if she is caught and must pay the appropriate penalty. The relatively large size of the underground economy in developing countries should, therefore, be explained by the heavy costs of regulation and taxation born by individuals and businesses in these countries, which lead to large benefits from going underground, and/or the low penalties from being caught.

These predictions are supported by Johnson, Kaufmann, and Zoido-Lobatón (1998). They relate different measures of the size of the underground economy relative to GDP to indexes of the burdens of regulation, taxation, and corruption in a sample of up to 49 countries in Latin America, the former Soviet Union, and the OECD. They find that the underground sector's size is larger (1) the larger the degree of regulation in a country, (2) the greater the burden of taxation, (3) the weaker "the rule of law" is (property rights are clearly defined, laws impartially enforced), and (4) the more corruption there is in the government bureaucracy. The first two sets of variables tend to measure the benefits of going into the underground sector to avoid government interference and taxation; the second two are related to the likelihood of getting caught and punished. The weaker the rule of law is and the more corrupt government officials are, the more likely it is that the law can be bent or an official bribed to avoid a penalty. Johnson, Kaufmann, and Zoido-Lobatón's findings are corroborated by Johnson, Kaufmann, and Shleifer's (1997) more intensive analysis of 15 former Soviet Union/bloc countries.

Johnson, Kaufmann, and Shleifer (1997, pp. 209–10) identify "three types of transition economies in Eastern Europe and the former Soviet Union. First, there

are politically repressed economies with highly distortionary taxes, low provision of public goods, but still, a small unofficial sector. Second, there are economies with relatively fair taxes, relatively light regulation, high tax revenues, and relatively good provision of public goods in the official sector; these are concentrated in Eastern Europe. Third, there are economies with relatively unfair taxes, relatively onerous regulation, low tax collection, and relatively poor public goods; these are concentrated in the former Soviet Union. Comparing the second and third groups, the former has a lower share of unofficial activity and faster economic growth than the latter."

The last observation draws a link between the size of the underground economy and the economic performance of a country. One reason given for why some poor countries fail to develop is that their public sectors are so corrupt and their tax and regulation systems so oppressive that their private sectors are not only driven underground, but out of existence. Evidence of a negative effect of corruption on the level of investment in a country is consistent with this interpretation.[7]

It is tempting when thinking of the second of the two questions posed above – Why has the underground sector grown so rapidly across all countries? – to seek an answer in the tremendous growth in government that has occurred since 1960. The growth of government regulations and taxation has driven the private sector out of sight. Some support for this answer seems to be present in Table 22.2. The government sector is much smaller in Switzerland and the United States than in the other countries in the table, and these two countries are among the three whose underground economies make up less than 10 percent of the GNP. But the third country with an underground sector that is less than 10 percent of the GNP is Austria, and its government sector is about in the middle of those in the sample. The growth in relative size of the government sector has been about the same in Sweden and the Netherlands, yet the growth in the underground economy seems much larger in Sweden. Linking up the size and growth of the government sector to the size and growth of the underground economies of the developed countries remains a challenging research task.

22.3 Government size and corruption

Transactions in the underground economy represent illegal activity by the citizens. Corruption constitutes illegal activity by those in government. As we have seen in the previous section, corruption raises the costs of doing business and tends to drive legitimate economic activity underground. Thus, corruption is generally regarded as a conspicuous example of government failure, and a justification for *not* resorting to government intervention.

Acemoglu and Verdier (2000) have pointed out, however, that corruption can be regarded as a form of *transaction cost* from using government to rectify market failures, and one which will be well worth paying if the market failure is significant.

[7] See Mauro (1995), and more generally regarding the quality of government and investment Clague, Keefer, Knack and Olson (1996) and Keefer and Knack (1995).

To see their point, consider the provision of a typical public good like a bridge. The local legislature votes to construct a bridge to be paid for at first by a bond issue with the bonds amortized through the subsequent collection of tolls for the use of the bridge. Even if a private firm is engaged to construct the bridge, the government must decide which private firm to engage. A bureaucracy, or at minimum a bureaucrat, paid for by the state, must choose a private firm to construct the bridge. The members of the legislature and the citizens whom they represent are thrust into a principal/agent relationship with respect to the bureaucrats making this choice. Lacking information about all the characteristics of the firms bidding for the construction contract, the legislature will in general not be in a position to determine whether the bureaucrats have chosen the bidder offering the best combination of quality and price. The legislature also will not be in a position to determine whether the bureaucrats' choice of a bidder was solely determined by the characteristics of the bid, or by the size of the bribe that accompanied it. Thus, corruption is almost an inevitable consequence of the existence of government and the principal/agent problems that come with it. Few, if any, activities of government give rise to more cases of corruption than the awarding of construction contracts.

To reduce the likelihood that bureaucrats sacrifice the public's interest for their own, they must be offered a wage *above* their opportunity costs in the private sector. By offering bureaucrats rents, and threatening them with dismissal should they be discovered to be corrupt, the principals in the legislature can reduce the incidence of corruption. As always, however, there are trade-offs – this time between the costs of paying all bureaucrats higher wages and the costs of having some corrupt bureaucrats – and thus the optimal wage for bureaucrats will not be so high as to eliminate all corruption.[8]

The illegal nature of corruption, like that of activity in the underground economy, makes it difficult to measure. Most studies use surveys of the victims of corruption – heads of businesses. Using such measures Persson and Tabellini (2000c) find corruption to be more prevalent in countries that use proportional representation electoral systems. They reason that PR systems are more prone to corruption due to the weaker accountability of individual politicians in the typical PR-list system in which voters can only choose among parties.

Goel and Nelson (1998) use convictions for public abuse of office as an index of corruption, and find that corruption at the state level in the United States increases with the size of state governments. Consistent with Acemoglu and Verdier's theory, Goel and Nelson find corruption to be inversely related to the wages paid to state employees.

22.4 Government size and economic productivity

Government should provide goods and services that lift citizens out of anarchy to higher levels of economic and social welfare. Many public goods can have direct positive effects on the efficiency of the private economic sector. Roads, canals, and

[8] See Acemoglu and Verdier (2000) for further discussion and results.

airports facilitate the transport of goods, a legal system can facilitate the exchange of goods and enforcement of contracts, education can improve the productivity of the workforce, and so on.

In addition to these direct effects on economic productivity, government activity can lead to productivity increases by (1) increasing the rate of utilization of the existing capital stock in a country prone to stagnation and unemployment, (2) reducing social conflict by reducing economic inequality and poverty, and (3) inducing higher work efforts due to the negative income effects of high taxation.[9]

Of course, government activity can also have negative effects on economic productivity by (1) inducing lower work efforts and savings due to the substitution effects of high taxation, (2) diverting profit-creating activities into rent-seeking activities, and (3) crowding out private sector investment and production (Hansson and Henrekson, 1994, p. 384).

These considerations suggest an inverted-U relationship between government activity and economic productivity as depicted in Figure 22.2. When the government sector is very small, roads and other infrastructure are low leading to low productivity. As the government sector expands infrastructure improves and productivity rises. Once the government sector expands beyond the optimal ratio g^*, productivity begins to decline as the disincentive effects of high taxation and government crowding out begin to dominate. When all of the gross domestic product is devoted to building roads and the like, economic productivity is again at a very low level.

Peden (1991) has estimated the relationship between labor productivity and the size of the government sector using aggregate data for the United States from 1929 to 1986. The data reveal an inverted-U relationship as in Figure 22.2, with the productivity peak coming at a ratio of government activity to GDP of 17 percent. During the first portion of the time period analyzed, the government sector fell short of its optimal size and productivity expanded with government growth. The optimal ratio was passed during the New Deal in the early 1930s, and since then the government sector has been a drag on productivity. Peden attributes the celebrated productivity slowdown that began at the end of the 1960s to the rapid expansion of the goverment sector in the United States that preceded it.[10]

Hansson and Henrekson (1994) have estimated the relationship between government activity and productivity at the industry level. By looking at productivity in the private sector, they avoid the problem of regressing government outputs onto government outputs, which occurs when aggregate output or productivity is regressed on government outlays. Their sample includes data on 14 industries and 14 OECD countries for the periods 1965–82 and 1970–87. Hansson and Henrekson do not estimate a nonlinear relationship between productivity and government expenditures but, given the nature of their sample, it is safe to assume that the government sectors in *none* of the 14 OECD countries was *smaller* than optimal size. Thus, assuming the nonlinear relationship between government size and productivity of

[9] For further discussion and references to the literature, see Hansson and Henrekson (1994), pp. 382–3.

[10] Some caution must be exercised in accepting Peden's estimate of optimal government size, given the very few observations he had when the government sector was smaller than 17 percent of national income. For related evidence, see Peden and Bradley (1989).

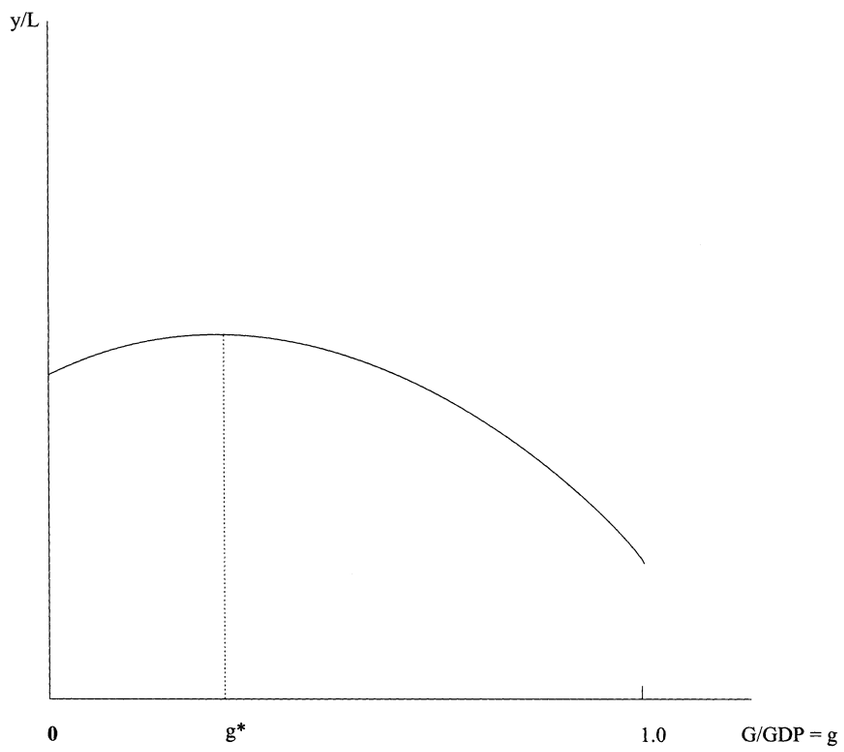


Figure 22.2. Relationship between productivity and government size.

Figure 22.2 is valid, the Hansson and Henrekson estimates should fall along the declining portion of the curve.

Equation (22.15) contains a representative example of Hansson and Henrekson's (1994, Table 5) results for the 1965–82 period (t-statistics are given below coefficients):

$$\begin{aligned} \text{TFPG} = {} & 0.042 + 0.023\,\dot{k} + 6905\,\dot{l} - 0.001\,\text{CATCH} \\ & \quad 4.52 \qquad 2.26 \qquad 9.34 \qquad 2.69 \\ & - 0.168(\text{GC-GE}) + 0.278\,\text{GE} - 0.050\,\text{GI} - 0.083\,\text{GTR} \qquad (22.15) \\ & \quad 4.24 \qquad\qquad 2.01 \qquad\quad 0.45 \qquad\quad 2.76 \\ & \bar{R}^2 = 0.543, \qquad n = 153. \end{aligned}$$

The dependent variable is total factor productivity growth (TFPG). The $\dot{k}$ and $\dot{l}$ variables are the share-weighted percentage changes in capital and labor, which have the predicted positive signs. CATCH is the log of the ratio of TFP in an industry and country divided by the highest TFP for that industry in the sample. CATCH is intended to capture the "catch-up" hypothesis. The lower the TFP in an industry in a particular country relative to the highest productivity for this industry, the greater the increase in productivity that can come about by the industry merely copying the available technologies in other countries and thereby catching up. CATCH has the predicted negative sign.

Our main interest, however, is in the government expenditure variables:

GC – GE = government consumption minus government education outlays
GE = government education outlays
GI = government investment
GTR = government transfers.

Both government consumption less education expenditures and government transfers have significant negative effects on industry productivity growth. A ten percentage point increase in government's noneducation consumption outlays reduces total factor productivity growth by 1.68 percent per annum. A ten percentage point increase in government's education outlays, on the other hand, *increases* TFP growth by 2.78 percent per annum. The 14 OECD countries in Hansson and Henrekson's sample would appear to be aligned along the *rising* portion of the government sector-productivity curve of Figure 22.2 with respect to education outlays. The coefficient on government investment is insignificant suggesting that the 14 OECD countries tend to be near the top of the government sector-productivity curve with respect to government investment.[11]

The results of Peden and Hansson and Henrekson reveal that government expenditures can have both positive and negative effects on productivity depending on both the size of the government sector and the nature of the government outlay. With the exception of education expenditures, the scale of government activity within the most developed countries of the world appears to have grown beyond the point that maximizes factor productivity.

Most developing countries have small government sectors, and should therefore be on the rising portion of the inverted-U in Figure 22.2. All governments are not alike, however, with respect to corruption and other attributes of government quality. Olson, Sarna, and Swamy (2000) show for a sample of developing countries that productivity growth is positively related to the quality of government institutions.[12] Both the size of government and the quality of its institutions appear to matter.

22.5 Government size and economic growth

22.5.1 *Methodological issues*

Several studies have tested for a relationship between government activity and a country's growth in income. Behind such tests is an assumption, as in the literature relating government size to productivity, of an inverted-U relationship between the scale of government and economic growth. This assumption is reasonable if we assume that the size of the government sector in each country is exogenously determined, or at least is chosen for reasons other than to maximize a country's rate of

[11] The 14 countries in Hansson and Henrekson's sample were Australia, Belgium, Canada, Denmark, Finland, France, Italy, Japan, the Netherlands, Norway, Sweden, the United Kingdom, the United States, and West Germany.

[12] They use an index of International Country Risk, which combines various factors of government policy that are of concern to international investors, to measure the quality of government institutions.

economic growth. Countries with small government sectors lack the infrastructure to achieve the maximum possible rate of growth (see Figure 22.3a – each point represents an observation for a country). These might be developing countries, which lack even the infrastructure to bring in sufficient tax revenue to supply needed government services (Kau and Rubin, 1981). Countries arrayed along the falling portion of the inverted-U have government sectors that are larger than optimal as far as economic growth is concerned, perhaps because their citizens have chosen to trade off growth for security in the form of a large redistributive government sector, perhaps because their government bureaucracies have succeeded in expanding the government sector beyond the point which the citizens would wish, or perhaps the government sector has grown *too large* for one of the other reasons discussed in the preceding chapter. Under the assumption that a single, inverted-U relationship exists between government size and growth, it does not really matter *why* government sectors are too large or too small; what matters is that both possibilities exist, that is, that countries are located all along the curve.

Alternatively, government leaders or citizens might choose the size of the government sector to maximize the rate of economic growth. If a single, inverted-U relationship between government size and growth exists for all countries, then all wish to have government sectors of the same size. Differences among countries reflect random shocks. The data consist of a cluster of points around the peak of the curve, and no statistical relationship can be observed between the two variables.[13] Given that government sectors range from under 20 percent of the GDP to more than 70 percent, this possibility does not seem likely – at least with respect to total government activity.

A third possibility is that there are several different relationships between government size and economic growth depending on other factors, like the level of economic development in a country. This possibility is illustrated in Figure 22.3b. Curve L depicts the relationship between government size and growth in countries with low levels of economic development, M in countries with middle levels of economic development, and H in highly developed countries. Countries with low levels of economic development typically have low literacy rates, large agricultural sectors, and other attributes that limit their potential rates of growth. Providing the levels of government infrastructure that lead to high growth in a middle-level development country will not do so in a low-level development country. Middle-level countries have the greatest potential for growth, as they can play the "catch-up" game of adopting the technologies of the highly developed countries. The latter cannot, of course, play the catch-up game, and thus their growth potential is more limited.

If within each level of development, countries were arrayed along the full range of the curve as in Figure 22.3a, each curve's parameters could be estimated by separating the data into subsamples of countries of similar levels of economic development. Any relationship estimated for the pooled sample would be spurious.

The same is true, if the size of the government sector is chosen in each country to maximize the rate of economic growth. Under this assumption observations for

[13] See Barro (1990, pp. S120–1), and for a more general methodological discussion, Slemrod (1995, pp. 381–9).

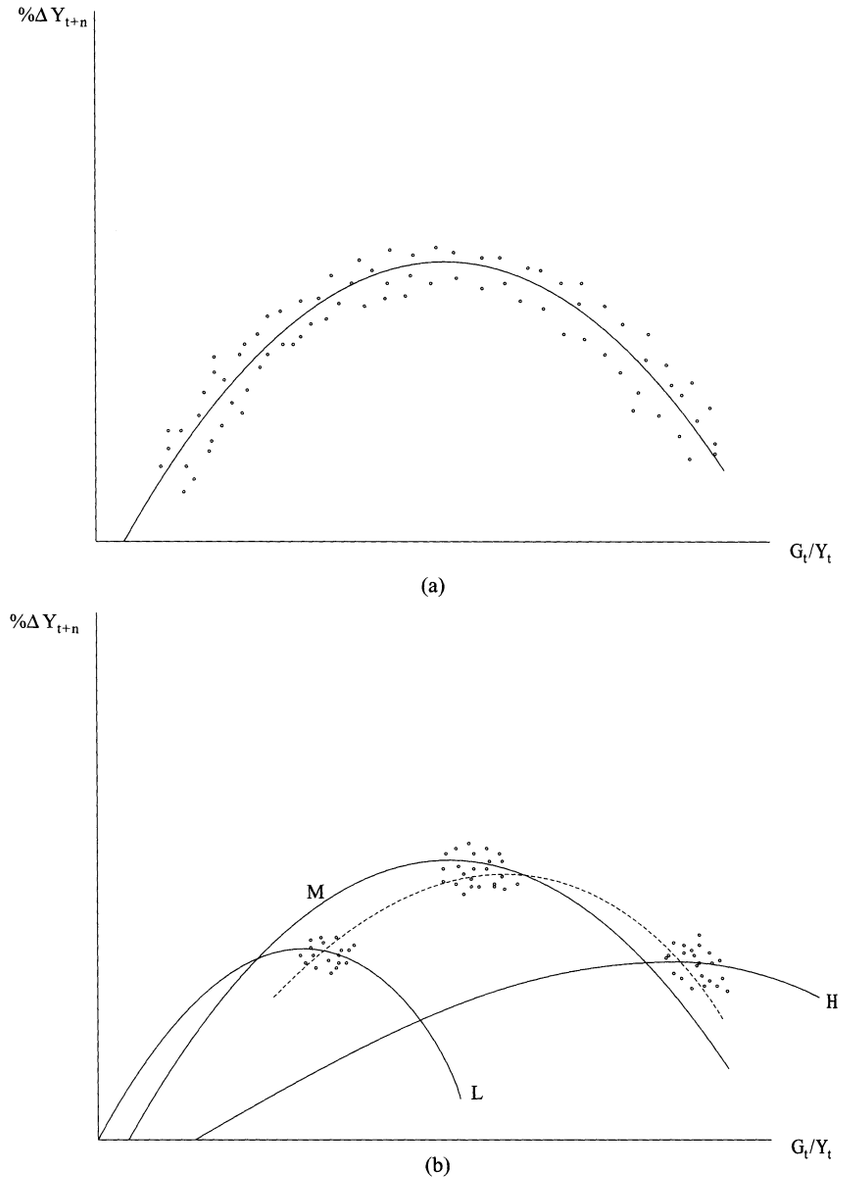


Figure 22.3. Relationships between government size and growth.

countries at each level of development would cluster at the peaks of their respective curves, as illustrated in Figure 22.3b. *If* the positions of the three curves were as shown in this figure, the dashed-inverted-U relationship between government size and growth would be estimated. The implications of this estimated relationship – that low-level development countries would grow faster with larger government sectors, and highly developed countries would grow faster with smaller government sectors – would both be false, however. Each country would have the optimal-sized government sector, given its level of economic development.

These considerations suggest that any systematic relationship that exists between the size of the government sector and economic growth may be difficult to uncover in cross-national data sets. To do so, one must specify carefully the various other control factors – like level of economic development – that may affect the relationship. The next subsection reviews the main findings in this literature.

22.5.2 *The evidence*

Problems of intercountry heterogeneity do not arise, of course, if one estimates the relationship between government size and growth using time-series data for a single country. Grossman (1987, 1988a, 1988b) has done this for the United States and Australia, and his results are consistent with the inverted-U prediction. His estimates for the United States reveal an inverted-U relationship between government size and growth and, like those of Peden (1991) using productivity data, imply that the government sector in the U.S. was *smaller* than the optimal size, in 1929. Grossman's figures suggest that the government sector grew too large, as far as maximizing the growth of income is concerned, during the 1940s.

Barro (1991) tested for the effects of both government size and political stability on the growth of real GDP per capita in 98 countries over the period 1960–85. A representative result from his study is presented in Table 22.3. As control variables Barro used initial income, secondary and primary education enrollment rates, and whether a country was located in Africa or Latin America. Initial income tests the catch-up hypothesis. The lower a country's initial income, the faster it grew. Several studies have failed to find evidence of a catch-up effect. In Barro's it appears only when initial levels of primary and secondary education are controlled for. Here we see evidence of the possible *positive* effects of government on growth, when governments provide primary and secondary education. Holding these and the four political variables constant, there appear to be elements in the African and Latin American cultural/political environments that lead to slower economic growth.

Turning to the political variables we see that the scale of government consumption in a country is *negatively* related to its growth in income. Barro defines government consumption *net* of education and defense expenditures, and thus includes only those activities that are least likely to affect growth positively. Barro argues that it is the distortionary effects of taxes to finance this consumption that leads to slower growth. Distortionary governmental regulation, as proxied by an index of price distortions, also has a negative impact on growth. Political instability, as measured by numbers of revolutions and assassinations, also affects growth adversely.

Barro also tested for a cross-sectional relationship between government investment and economic growth, and found none. Since government investment should have the most direct relationship to economic growth of all components of the public budget, this finding of Barro is consistent with the hypothesis that all governments select the optimal levels of investment for growth, and thus that no cross-section pattern can be observed.

Additional cross-national evidence of a negative relationship between government size, somehow measured, and economic growth has been provided by

Table 22.3. *Growth in income per capita and government size (dependent variable is growth rate of real GDP per capita, 1960–85)*

Coefficient (standard errors)	Explanatory variables
0.0345 (0.0067)	Constant
	Economic and cultural control variables
−0.0068 (0.0009)	GDP per capita (real) in 1960
0.0133 (0.0070)	Secondary school enrollment rate, 1960
0.0263 (0.0060)	Primary school enrollment rate, 1960
−0.0114 (0.0039)	African nation dummy
−0.0129 (0.0030)	Latin American nation dummy
	Political variables
−0.094 (0.026)	Government consumption/GDP
−0.0167 (0.0062)	Revolutions per year
−0.0201 (0.0131)	Political assassinations per million of population and year
−0.0140 (0.0046)	Price distortions index
$R^2 = 0.62$, $n = 98$	

Source: Barro (1991, Table 1, eq. 14).

Landau (1983), Weede (1984), Grier and Tullock (1989), Scully (1989), Grossman (1990), Fölster and Henrekson (1999, 2001), and Mueller and Stratmann (2000). Of particular interest is the study by Grossman. He, like Barro, attempts to separate the positive and negative impacts of government on growth. Like Barro, he also argues that the negative impacts are due to distortionary taxes. He thus introduces the relative levels of taxation across countries as a separate variable, and finds that it does indeed have a negative and significant effect on growth. Holding this tax effect constant, government consumption expenditures (including education and defense) have a *positive* effect.

Positive effects of government size on growth have also been measured by Ram (1986) and Aschauer (1989), while Kormendi and Meguire (1985), Easterly and Rebelo (1993), and Agell, Lindh, and Ohlsson (1997) essentially find no relationship. Agell, Lindh, and Ohlsson are highly critical of the econometric techniques used in the earlier studies, but more careful econometric tests reveal that, at least for the OECD countries, higher taxes and larger government sectors have a significant negative effect on economic growth (Fölster and Henrekson, 1999, 2001).

Further, although somewhat indirect, corroboration for this statement is provided by the studies of Alesina and Rodrik (1994) and Persson and Tabellini (1994). They argue that government taxation and other sorts of interventions to bring about income inequality are likely to be greater, the greater the initial level of income inequality is. Since these redistribution policies introduce distortions that harm growth, a negative relationship between income inequality and economic growth is predicted and observed.

Persson and Tabellini find that the negative relationship between income inequality and economic growth holds only for democracies.[14] This result is plausible, since the ability of the poor to pressure the government for redistribution is likely to be greater in a democracy. This observation in turn raises the question of the possible effects of democratic institutions on economic growth independent of the size of the government sector. This question was addressed in Chapter 18 and is, therefore, only briefly discussed here.

Some studies have distinguished between democratic and nondemocratic forms of government; others have constructed indexes of economic and political liberties. As with the government size/growth literature, studies can be cited that find a positive relationship between growth and democracy/liberty, a negative relationship, or no relationship whatsoever.[15]

As Levine and Renelt (1992), de Haan and Siermann (1995, 1998), and Heckelman and Stroup (2000) show, the relationship one estimates seems to be very sensitive to the measures of economic liberty and democracy that one uses and the additional explanatory variables included in the equation. Nevertheless, at least with respect to the effect of *economic* liberties on growth, the most recent studies paint a fairly consistent picture. Both Abrams and Lewis (1995) and Knack (1996), for example, find that low-income countries do indeed grow faster than the high-income countries, as the catch-up hypothesis predicts, *if* they have high levels of economic liberties, or in the Abrams/Lewis study are not classified as planned economies.

To measure the strength of market institutions, Knack used the index of International Country Risk (ICR) described earlier. When he omitted this index, he obtained the following results for a sample of the 24 richest, non-OECD countries in 1960.

$$\underset{(0.20)}{\text{GR6089} = 1.98 - 0.179 \log \text{GDP60},} \qquad \bar{R}^2 = -0.04 \tag{22.16}$$

where GR6089 is the growth in income per capital between 1960 and 1989, and GDP60 is income per capita in 1960. The number in parentheses below the coefficient on logGDP60 is the t-ratio. Without the ICR index, there is no evidence of

[14] Alesina and Rodrik, on the other hand, find that the relationship holds regardless of a country's form of government.

[15] Positive effects of democracy and/or liberty on growth have been reported by Pourgerami (1988, 1992), Scully (1988, 1989, 1992), Grier and Tullock (1989), Dasgupta (1990), De Vanssay and Spindler (1994), Abrams and Lewis (1995), Keefer and Knack (1995), Knack (1996), and Heckelman and Stroup (2000); negative effects have been reported by Landau (1983, 1986), Sloan and Tedin (1987), and Barro (1997); no systematic effects of democracy and/or liberty on growth have been reported by Kormendi and Meguire (1985), Marsh (1988), Levine and Renelt (1992), and de Haan and Siermann (1995).

catch-up. When the index is added, however, a significant catch-up effect appears, and the index itself has a positive effect on growth.

$$\underset{}{\text{GR6089}} = \underset{}{1.43} - \underset{(2.49)}{1.93}\ \log \text{GDP60} + \underset{(4.89)}{0.09}\ \text{ICR}. \tag{22.17}$$

The signifcant effect of this index of the strength of market institutions holds up with the addition of the measures of school enrollment used by Barro. The works of Barro, Abrams and Lewis, and Knack highlight the positive things governments of developing countries can do to increase the likelihood that they catch up to the richest countries – provide primary and secondary education, free up and protect market institutions.

In closing this review, mention must be made of the recent tests for the robustness of the relationship between economic liberty and growth by de Haan and Siermann (1998). They found that all *nine* of the different measures of economic liberty that they tried had a positive effect on growth, and at least three of them were robust to the inclusion of other variables in the equation. Although uncertainty may remain concerning the *magnitude* of the impact of economic liberties and market institutions on growth, there seems now to be little reason to doubt that their impact is positive.[16]

22.6 Government activity and the economic decline of nations

22.6.1 *The logic*

Where much of the literature relating democracy and economic liberties to growth is concerned with why developing countries do or do not succeed in catching up to the rich countries, Olson (1982) put forward an explanation for why some rich countries "catch up" to poorer ones – why some rich countries enter into economic decline. Although the title of the book in which Olson developed this hypothesis is *The Rise and Decline of Nations*, the novelty of the work lies mostly in Olson's account of the causes of economic decline. Olson's hypothesis builds on his analysis of interest group formation, which we discussed in Chapter 20. Most interest groups pursue redistributive objectives. Business, trade, and professional associations are primary examples of such groups, as are unions. In each case, much of the activity of these groups, insofar as it impinges on others in society, is devoted to creating or preserving monopoly positions. Medical associations seek to restrict entry into medical schools and the licensing of foreign-trained physicians. Unions seek to force employers to hire only union members and to determine wages and other employee benefits by bargaining with the union. Business associations and unions both seek to protect their members from foreign competition by obtaining tariffs and quotas on imports; and by obtaining regulations requiring that the government favor domestic producers in its purchases, government workers favor the nation's flagship airline in their travel, and the like. Thus, much of the activity of the economically oriented interest groups falls under the heading of rent seeking (p. 44).[17]

[16] See also Wu and Davis (1999) and Leschke (2000).

[17] All remaining page references in this section are to Olson (1982) unless otherwise noted.

Many interest groups that are not organized along business, trade, or occupational lines, nevertheless, have goals that are, at least in part, distributional. The objectives of associations of the handicapped, the aged, and welfare recipients are largely distributional. Women's and ethnic groups have sought legislation imposing de facto if not de jure hiring quotas on employers.

The heavy emphasis that interest groups place on distributional goals has the consequence that their activities lead largely to jockeying for positions along the utility possibility frontier, not to shifts outward in the frontier. Moreover, each restriction on entry, each quota, and each regulation creates an efficiency loss that shifts inward the utility possibility frontier (pp. 41–7). As more and more energy is devoted to carving up the pie, the pie gets smaller.

Olson uses this redistribution-efficiency loss argument to explain differences in growth rates across nations. Not only does the activity of interest groups (Olson names them "distributional coalitions") shift the production possibility frontier inward, it retards the speed at which it moves outward as a result of the normal growth process. Interest groups tend to be democratic in varying degrees and thus are slow to reach decisions. They are therefore slow to respond to change, and impede the speed with which the organizations that they affect can react to or implement changes. The consequence is that "*distributional coalitions slow down a society's capacity to adopt new technologies and to reallocate resources in response to changing conditions and thereby reduce the rate of economic growth.*"[18]

From this important proposition it follows that a country's growth rate varies inversely with the level of interest group activity ceteris paribus. It takes time to overcome free-rider inertia and to discover the combinations of collective benefits and selective incentives that can induce active involvement in interest group activities. Long periods over which the social and political environment of a country remains stable are conducive to the appearance of new interest groups and the strengthening of existing ones. Periods of social and political stability give rise to growing numbers of interest groups, growing distributional conflicts, and a slowing of economic growth. Conversely, a country whose interest groups were somehow destroyed or institutionally constrained from pursuing their institutional objective would grow faster than one heavily burdened by interest group activity, with again the important ceteris paribus proviso. Olson uses this argument to explain differences in growth rates over the first 25 years after World War II across developed democracies. Germany, Italy, and Japan suffered the greatest devastation to their economic and political institutions, and their growth performance was among the best of the developed countries up through 1970. The occupied, continental European countries also had their interest group structures disrupted to a degree by the war, and then the strength of their interest groups was further eroded by the formation of the Common Market. They, too, had impressive growth rates in the fifties and sixties. Ironically, or so it would seem, it was the countries whose economies and social-institutional structures were least damaged by the war (Australia, New Zealand, the United Kingdom, and the United States) that performed most poorly in terms

[18] Bowles and Eatwell (1983) question the leap from arguments related largely to static efficiency to conclusions regarding dynamic performance. Olson defends himself on pages 61–5, and also cites Hicks (1983) in support.

of economic growth up through the early seventies.[19] The power in Olson's thesis comes in explaining why this fact should *not* be viewed with surprise. Indeed, it is precisely because the fabric of interest group structures existing prior to the war was left untorn that these Anglo-Saxon countries performed so poorly relative to both the countries suffering defeat in the war and those that suffered occupation (ch. 4).

Olson employs the logic of his thesis to explain both the exhilarating effect on economic performance of forming a larger economic federation or customs union (ch. 5), and the debilitating effects of discriminatory practices (ch. 6). An intriguing and somewhat controversial example of the latter is Olson's explanation for India's poor economic development performance alongside that of some of its Asian neighbors. Olson attributes India's relatively poor economic performance to an important degree to the rigidities growing out of the caste system. Olson argues that the castes emerged from guilds and other occupational groupings and have functioned like other distributional coalitions trying to protect whatever monopoly or monopsony power its members have. Restricting marriages to members of one's own caste was a form of entry barrier to control the size of the caste and protect its monopoly position. The heavy concern with distributional issues as reflected in the caste system has had the same debilitating effect on India's growth that the distributional struggles among organized interests have had on India's former ruler, Great Britain (pp. 152–61).

22.6.2 *Empirical evidence*

Several attempts have been made to test Olson's theory empirically. The chief challenge comes in trying to measure the strength of interest group activity (Abramovitz, 1983; Pryor, 1983). In initially setting forth the theory, Olson argued that Italy, Germany, and Japan's strong postwar economic performance could be explained by the destruction of their interest group structures wrought by the war and immediate postwar occupation. These examples suggest the hypothesis that interest group strength can be measured by the length of time that has elapsed since a nation's inception, or since its rebirth following a war or revolution. Most tests of the thesis have thus used some time-dependent proxy for interest group strength. Choi (1983) constructed an index of "institutional sclerosis" for 18 OECD countries based on (1) the point in time when common-interest groups begin to accumulate, (2) what and when major disruptions occurred, and how long they lasted, and (3) how strong each disruption was. An example of the results Choi obtained is presented as (22.18) (Choi, 1983, p. 73, equation 14):

$$\underset{(8.81)\ (4.78)}{Y = 7.75 - 0.074\,\mathrm{IS}} \qquad R^2 = 0.59, \qquad n = 18. \tag{22.18}$$

The dependent variable is the growth in income per capita from 1950 to 1973 and IS is one of Choi's measures of institutional sclerosis, defined to fit a logistic curve so

[19] See, for example, Pryor (1983, Tables 5.3 and 5.4, p. 99). Logically, Canada might also be expected to be in this group, since its borders were not crossed during the war. But its growth performance, although not above the average, was also not below.

that it already incorporates a diminishing impact of time on interest group strength after some point. The negative and significant impact of institutional sclerosis proved resilient to (1) how this variable was measured, (2) the choice of dependent variable, and (3) the composition of the sample.

The best example of a nation suffering from acute institutional sclerosis after World War II was the United Kingdom. The best examples of nations rejuvenated by the destruction of their interest group structures were the three axis nations. Murrell (1983) presented yet another test of the hypothesis by more closely examining the U.K. and West German economies.

Murrell reasoned that interest group strength in the United Kingdom would be weakest in the newest industries to have formed, since in these industries interest groups have had the shortest time to develop. Thus, the performances of U.K. industries should be the most comparable to that of West Germany in "young" industries, the furthest behind in "old" industries.

To test the hypothesis, Murrell compared the growth rates of young (j) and old (k) industries in the United Kingdom (UK) and West Germany (WG), standardizing for differences in the average (A) growth rate in each country. The hypothesis was that the growth rates of young industries in the United Kingdom would be relatively higher; that is, the inequality in (22.19) would hold, where G stands for an industry or commodity growth rate from 1969 through 1973:

$$\frac{G_j^{UK} - G_k^{UK}}{G_A^{UK}} > \frac{G_j^{WG} - G_k^{WG}}{G_A^{WG}}. \tag{22.19}$$

The proportions of cases in which (22.19) is satisfied are all significantly above the 0.5 predicted by the null hypothesis, and thus support the hypothesis that institutional sclerosis in the United Kingdom is most advanced in the older industries.

Olson reported results analogous to those obtained by Choi for the 48 contiguous states. A representative example is presented as (22.20):[20]

$$\underset{(7.02)}{Y = 10.01 - 2.69\,\text{STACIV1}} \qquad R^2 = 0.52, \qquad n = 48. \tag{22.20}$$

The dependent variable is the growth rate of per capita private nonfarm income during 1965–78. STACIV1 is the number of years since statehood divided by 178, with all Confederate states having been assumed to be reborn in 1865. As with Choi's results for the OECD, the significant negative effect of a state's age remains reasonably robust to changes in the definition of the dependent and independent variables (Olson, 1982, pp. 98–108).

As Pryor (1987, pp. 223–4) noted, one might have expected from Olson's theory that the "rise of the South" following its defeat in the Civil War would have begun before the end of World War II, yet the South underperformed the North up through the 1930s.[21] In general, tests of Olson's theory using state data from the United States have tended to reject its implications. Gray and Lowery (1986) found a complete collapse of the Olson model using state data, when it was tested over

[20] Equation (24), Table 4.1, p. 104. Olson credits Kwang Choi with having done the regression work.
[21] Quiggin (1992, p. 271) makes a similar point.

a later time period and other variables were added to the equation, as did Wallis and Oates (1988) when population growth by state was treated as an exogenous variable. Nardinelli, Wallace, and Warner (1987) found little support for Olson's hypothesis once differences in income across states were included. On the other hand, corroborative evidence using state data was presented by Vedder and Gallaway (1986), and by Dye (1980).

By and large, tests of Olson's theory using cross-national data have tended to confirm it. Lane and Ersson (1986) found that Choi's measure of institutional sclerosis maintains its significance as other variables are placed alongside of it and the dependent variable is measured over different time periods. Additional studies reporting evidence for the Olson hypothesis based on cross-national comparisons include Whiteley (1983), Paloheimo (1984a,b), Weede (1984, 1986, 1987), Datta and Nugent (1985), Lange and Garrett (1985), Lehner (1985), Goldsmith (1986), McCallum and Blais (1987), Jankowski (1993), and Heckelman (2000b). Quiggen (1992) argues that the hypothesis should be tested using income *levels* rather than growth rates, and rejects the "strong form" of the hypothesis using income levels as the dependent variable, and cross-national data.[22]

An important component of the Olson hypothesis is that interest group strength increases with the number of years over which a country experiences political stability. Kennelly and Murrell (1987) supported this part of the theory by showing that interest group numbers are larger in those industries in which the redistributive gains from interest group action are potentially larger. Murrell (1984) has also established that the number of organized interest groups in a country is positively related to the number of years that a country has had a modern political system receptive to pressure from interest groups. On the other hand, Gray and Lowery (1986) did *not* find a relationship between the age of a state and the number of interest groups in it. Their finding may explain the breakdown of the hypothesis when state data are used.

Many objections to Olson's theory stem from observations of a given country, whose growth record and interest group structures do not accord with what Olson's theory seems to predict, or that argue for a more complicated formulation of the theory (Asselain and Morrison, 1983; Lehner, 1983; Rogowski, 1983; Schuck, 1984; Gustafsson, 1986; Rasch and Sorensen, 1986; Pryor, 1987; Quiggin, 1992). Of particular interest in this regard is the case of Switzerland. Switzerland had the fourth highest index of institutional sclerosis in Choi's list of 18 OECD countries (1983, p. 70), and "has a very differentiated, pluralist structure of interest organization" (Lehner, 1983, p. 204). Yet, its degree of tariff protection was lowest among the 18 OECD countries (Olson, 1982, p. 134), and its growth rate above average over the fifties and sixties (Lehner, 1983, p. 70). The explanation for this apparent inconsistency with Olson's theory is found in the strong federalist nature of its political structure, and the importance of direct democracy at the local level or in the form of the referendum. Since legislative decisions either must be subjected to a referendum vote or can be petitioned to a referendum vote, interest groups cannot

[22] Pryor (1983) should also be cited here, but he did not test for the impact of some time-of-stability variable on growth, but rather tested for the impact of several additional variables that he claimed should be correlated with growth if Olson's theory is correct: population size, communist rule, ethnic heterogeneity, and religious heterogeneity. None of these had a significant impact on country growth rates.

strike a bargain with the parties in Parliament or with members of key legislative committees, and obtain redistributional favors, unless a majority of the citizens are willing to ratify the bargain. With the outcomes of referenda being hard to predict, forming a minimum winning coalition is a precarious strategy and the legislature strives for consensual policies (Lehner, 1983). The result is that redistributional struggles do not figure prominently in Swiss political life, despite the strength of their interest group structure.

Thus, one can conclude that Switzerland does not run counter to the main tenets of Olson's theory. The political institutions of Switzerland protect it from the undesirable consequences of the distributional struggles that would otherwise ensue given its fractionalized interest group structure. But the example of Switzerland does point to an important lacuna in Olson's argument. Olson focuses almost exlusively on interest groups and leaves out an analysis of how interest group pressure is channeled by the political and economic institutions of a country to produce the outcomes his theory predicts (Paloheimo, 1984a,b; Lehner, 1985).

This latter point has been pressed by Tang and Hedley (1998) in one of the most recent tests of Olson's theory. Tang and Hedley criticize Olson for neglecting the positive stimulus to growth that government policies can have *when interest groups are weak*. They hypothesize that Olson-type measures of sclerosis will have the predicted impact on growth only in countries where the state has the strength to play an active role in promoting growth. They find support for this hypothesis in a sample of Asian and Latin American countries. The higher growth rates in the Asian countries over the last few decades are attributed to the positive roles government has played in stimulating growth *and* the weak interest group strength in these countries.

In Olson's 1982 book, Germany's economic success was attributed to the destruction of its interest groups during World War II, and Sweden's success was attributed to the cooperation among its large, "encompassing" interest groups. Over the last quarter of the twentieth century, the growth rates of Germany and Sweden have not exceeded those of Great Britain and the United States, and over the last decade of the century even Japan showed signs of sclerosis. If Olson's theory is valid, then we must conclude that interest groups have had sufficient time to entrench themselves in Germany and Japan and thereby have brought on sclerosis, and that interest groups have become less encompassing and cooperative in Sweden.[23] One might buttress the argument further in favor of the Olson hypothesis, by arguing that the Reagan and Thatcher "revolutions" in the United States and the United Kingdom had the kind of interest-group-destroying impact on labor unions that Olson's theory requires for growth. Despite the many tests of Olson's theory that have been made, it still invites more testing.

22.7 Conclusions

In this chapter we have examined several possible effects of government policies on economic activity. The emphasis has been on the negative effects of government

[23] For a discussion of Germany's "decline" that is consistent with this interpretation, see Giersch, Paque, and Schmieding (1994). For a discussion of the weakening of cooperation among Sweden's major economic interest groups and the country's relative decline, see Lindbeck (1997).

intervention into the economy. As with almost all questions, the empirical literature that tries to measure these effects does not speak with a clear and unequivocal voice. Nevertheless, the weight of the evidence to date allows us to draw some general conclusions. (1) Taxes distort choices wherever they are levied, and thereby reduce welfare. The magnitude of these welfare losses is in doubt, but it seems likely that it is substantial. (2) The underground economy has, like the government sector, been growing in both developed and developing countries since at least 1960. In some of the developing countries it accounts for as much economic activity as the official sector. High levels of regulation, taxation, heavy-handed and arbitrary administration of regulations, and corruption all encourage the growth of the underground economy. (3) The relationship between the relative size of the public sector and economic performance, as measured by either productivity in the private sector or growth in GDP per capita, is an inverted-U. Too small of a government sector can harm economic performance by denying the economy infrastructure and the educated labor force that it needs to perform optimally. Beyond some point, however, the adverse incentive effects of government activity begin to outweigh its positive effects on economic performance. All of the highly developed countries in the world appear to be in the downward sloping part of the curve.

More tentative are the conclusions one can draw about the effects of democracy on economic performance. Here there is evidence that some forms of bureaucratic, authoritarian governments can bring about faster economic growth than can democratic governments, but the conclusions one can draw depend on both how the different forms of government are categorized, and the composition of one's sample. Equally tentative are the conclusions one can draw from the empirical literature regarding the long-run effects of democratic stability on economic growth. Although democratic stability does appear to have produced "economic sclerosis" in the developed countries of the world in the post–World War II period, the extent to which the "Olson hypothesis" applies to other countries and other time periods is still not clear.

Less controversial is the proposition that *economic liberty* fosters economic growth. Independent of whether their governments are democratically chosen or not, countries with institutions in place that underpin market exchange by ensuring property rights, enforcing contracts, and the like have higher growth rates in GDP per capita.

Virtually all of the works discussed in this chapter have appeared since 1980, and a good number since 1990. This research can be expected to continue to grow at a brisk rate in the years ahead.

Bibliographical notes

Rose-Ackerman (1999) provides a nice overview of the problem of corruption in government. Bardhan (1997) surveys the literature on corruption in developing countries.

Barro (1997) updates his earlier work discussed in the text.

Aghion, Caroli, and Garcia-Peñalosa (1999) survey the literature on economic inequality and growth.