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Are there Natural Limits to the Growth of Government?

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NATURAL AND CONSTITUTIONAL LIMITS TO GOVERNMENT: A SURVEY

Two kinds of limits on government activity may be distinguished:

1. Natural limits, which appear endogenously within a given institutional structure of society, particularly given the economic institutions;
2. Constitutional limits, which are imposed exogenously by the consensus reached among individuals behind the veil of uncertainty (see Buchanan and Tullock, 1962; Buchanan, 1977; Frey, 1983).

Government activity takes place in three different forms:

1. taxation;
2. public expenditure;
3. regulation.

The three forms of activity can be combined with the two kinds of limits as is shown in table 6.1. This table indicates the amount of knowledge about governmental limits, and hints at the scientific contributions dealing with these limits.

This section looks briefly at the state of our knowledge about the limits to government, proceeding from taxation, to public expenditure, to regulation. The next section aims at making a contribution about that area of government activity whose limits are least known: regulation. A politico-economic model is presented that establishes natural limits to government regulations. The third section shows that testable propositions can be derived, and the final section presents a summary.

Table 6.1 *Knowledge about forms of, and types of limits to, government activity*

	Forms of government activity		
Limits	*Taxation*	*Public expenditure*	*Regulation*
Natural limits	Much knowledge: Laffer curve and shadow economy	Considerable knowledge: traditional economics	Very little knowledge
Constitutional limits	Much knowledge: Brennan–Buchanan type of rules	Some knowledge: Institutional public-choice	Little knowledge

Taxation

Natural limits

The Laffer curve (as it is now called) is a generally known representation of the limits to taxation which arise endogenously, given the institutions of society: a too large increase in the tax rate does not raise tax revenues, but diminishes them after some time, because individuals and firms reduce the input of labour and capital. Of even greater importance than increased leisure is the switch to the shadow economy, where economic activity is not taxed.[1] According to Tanzi's (1980), Feige's (1982) and Frey and Weck's (1984) empirical estimates, increasing tax rates lead to an increase in the size of the untaxed shadow economy. As Peacock and Shaw (1982) have shown, this does not result in a corresponding decrease of tax revenues, because disposable income is higher and part of it is spent on goods produced and sold in the official (taxed) economy. Nevertheless, under most conditions, the switch to the shadow economy is likely to reduce tax revenue.

An important contribution to the Laffer curve and the limits of taxation has been made by Buchanan and Lee (1982), who distinguish two time periods. In the short term, defined by the time horizon of the government,[2] the individuals (and firms) have little possibility in adjusting to an increase in the tax rate. This short-run Laffer curve shifts downwards over time, as shown in figure 6.1. The long run is that time period within which all the adjustments (reductions in work time, switch to the shadow economy, etc.) have been completed. This yields the long-run Laffer curve, also shown in figure 6.1. Assuming that the government maximizes tax revenue, an equilibrium (stable) tax rate τ^{**} exists where the maximum on a short-run Laffer curve cuts the long-run Laffer curve in figure 6.1, $SRLC_2$. There is no incentive to change this tax rate: the individuals have completed their

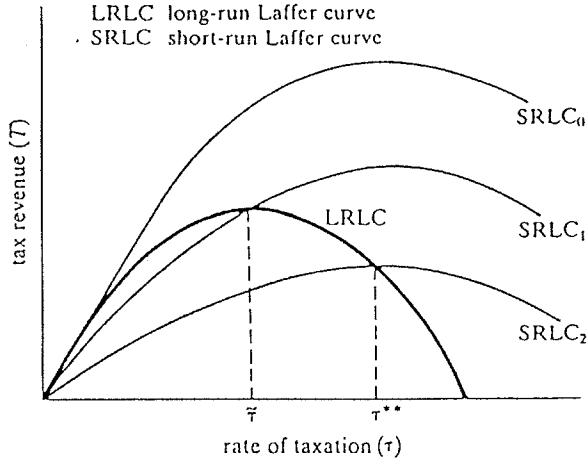

Figure 6.1 Short-run and long-run Laffer curves, the equilibrium rate of taxation (τ^{**}) and the long-run revenue-maximizing rate of taxation ($\bar{\tau}$).

adjustments (they are on the long-run Laffer curve), and the government maximizes its revenue. A tax rate lower or higher than τ^{**} would reduce tax revenues within the relevant political time horizon, as indicated by the short-run Laffer curve $SRLC_2$. As may be seen from the figure, this equilibrium tax rate τ^{**} is *finite*, but is larger than the tax rate $\bar{\tau}$, which maximizes tax revenues in the long run. The politico-economic analysis of the Laffer curve thus indicates that there are endogenous limits to taxation.

Constitutional limits to taxation

The tax burden imposed on the population may be *directly* limited by establishing constitutional limits to the maximum share of GNP that may be taxed. Efforts have been made in the United States to bring about such rules, and referenda have been carried out to prevent state governments from exceeding certain limits, or to raise certain taxes (see, for example, Ladd and Tideman, 1981). More *indirect* constitutional limits on taxation have been propounded, especially by Brennan and Buchanan in their book, *Power to Tax* (1980). These rules – for example, restricting the tax base or prohibiting regressive tax rates – need not be repeated here. A more general way of looking at these indirect rules would be that they serve to encourage tax avoidance by either increasing the *range* of economic activities that remain untaxed (for example facilitate the exit to all kinds of 'unofficial' economies, or to lower-taxed regions and countries), or by increasing the *incentives* to leave the (more

highly) taxed sector (for example, by regulating the admissible tax schedules or by reducing expected punishment for tax fraud).

The literature on the constitutional limits to taxation offers a rich menu of possibilities, and the theoretical and empirical research in the area is rapidly progressing. The tax-limitation proposals, however, are not without problems and the government may resort for finance to all sorts of para-fiscal bodies such as public enterprises, for which a monopoly position is provided. Such manoeuvres are difficult, and sometimes impossible, to prevent on the basis of simple constitutional provisions. This means that the constitutional approach to tax limitations may result in a game between the providers of constitutional rules and governments which constantly seek new ways to raise finance. History teaches us that although governments are not usually known as great inventors, they show a remarkable ability in finding new ways of finance (see chapter 9 below).

Public expenditure

Natural limits

The basic problem of limiting public expenditure (compared to limiting taxation) is that the *benefits* of such activity are separated from the *cost* of financing, be it by taxation, credit or money-printing. This separation occurs over time, because the cost of financing – for example, by debt issue (the induced rise in the rate of interest and crowding out of private investment – is not immediately felt, and it occurs between groups, because those who benefit from public expenditure are not usually those who have to carry the respective burden of financing them. These relationships are the object of traditional economics, which has studied the effect taxes, bond issues to the public and money-printing have on economic activity (especially GNP), and how this in turn influences the future possibilities for financing government expenditure. The conditions (for example, open or closed economies, fixed or flexible exchange rates) influencing these interactions between the benefit and cost side of public expenditure, and therewith the endogenous limits to such public activity, are reasonably well known.

Constitutional limits

The *direct* approach to limiting public expenditure is, as in the case of taxation, to set a maximum share of GNP which may not be surpassed, or to require budget balance (in the strict sense). Such efforts have again been made in the United States. A more *indirect* approach is to strengthen the relationship between *benefit* and *costs*. One possibility is to reduce 'fiscal illusion'; another is to weaken the position of those political actors (such as public bureaucracy) who have an interest in maintaining and expanding

the separation between benefits and costs of government expenditure. This can be reached by many different institutional provisions, such as the creation of small governmental units (which result in better information and a stronger participation of the population in public decisions), or increased formal possibilities for political participation by the population, such as referenda. The latter has been empirically shown (Pommerehne and Frey, 1978) to weaken the government's and bureaucracy's power to expand expenditures. Although there exists considerable theoretical knowledge of how to limit the government's expansion of its expenditures, on the whole there is relatively little empirical evidence on how effective such institutional provisions are. Moreover, there may be great political resistance to the introduction of such constitutional rules.

Governmental regulations

Direct, non-monetary interventions of the government in economic activities are of great and increasing importance in modern industrial societies. The costs imposed thereby on individuals and firms seem to be quite substantial, if we can trust the estimates by Weidenbaum (1979), who calculates that these costs in the United States amounted to 4.3 per cent of GNP in 1979,[3] or by Downing and Lawson (1979), who calculate them for the same country to be 9.4 per cent of GNP in 1976. The increasing importance of this type of government activity – at least in the United States – is also noted by authors such as Christainsen and Haveman (1981): setting the index base at 100 in 1947, the cumulative number of 'major' pieces of regulatory legislation has grown to 402 in 1977, the volume of federal expenditure on regulatory activities to 1004, and the number of full-time federal personnel engaged in regulatory activities to 668. A surge in governmental regulations must be expected to occur to the extent that the limits on taxes and public expenditure are effective: governments then have an increased incentive to resort to this instrument for wielding power, as has been noted, among others, by Aranson and Ordeshook (1981). Consequently, it is of great importance to study the endogenous and exogenous limits to public regulations.

Practically nothing is said or known in the literature about possible endogenous forces or exogenous limits which might limit the growth of governmental regulations.[4] In their book *Power to Tax*, Brennan and Buchanan fully accept the (potential) importance of regulations by stating: 'A government subjected to tax-limit pressures will surely be predicted to exert more efforts through the legal process towards opening up direct regulatory channels', but immediately admit: 'There is little that we can do here than to acknowledge the "limits of tax limits" in this respect' (1980, p. 166). Indeed, the topic is not treated elsewhere in the book, nor is it in other specialized treatises on the subject such as Ladd and Tideman (1981) or Folkers (1983).

While the scientific literature is silent on the issue, in practical politics types of 'constitutional' limits that may serve to restrict public regulations have been discussed and actually applied. In Switzerland, for instance, the number of public employees on the federal level has been strictly limited for several years. This of course restricts the number of regulations issued only if the 'productivity' of public bureaucrats with respect to issuing regulations is constant, an assumption for which there is no basis. It has also been suggested that the number of laws issued by parliament should be restricted constitutionally. Again, the purpose is only served if it may be assumed that the 'quality' or content of the laws remains unchanged, which is unlikely to be the case.

The lack of ideas on how to limit effectively the *effects* of regulations by *constitutional* rules is due to the difficulty or impossibility of measuring the 'output' for this kind of public activity. This constitutes a major difference to both taxation and to public expenditure, which due to their monetary form are, at least in principle, amenable to measurement. Due to the inherent difficulty of measuring the output of the government's regulatory activity, there does not seem to be any possibility to restrict the growth of public regulations by any kind of direct constitutional rule.

Evaluation of the limits to government

Our discussion suggests that there is a relatively large amount of knowledge about the natural and constitutional limits to taxation. Less is known about how to limit public expenditure effectively, but the real problem lies with the growth in government *regulations*. This fact is not the result of chance. In a period in which the public and the politicians become increasingly aware that an extension of government activity does not in general solve social problems (and sometimes may even worsen them), and political pressure mounts to put limits on the state, the government and its bureaucracy have an incentive to become more active in the regulatory area, which by its very nature is difficult or even impossible to control by direct constitutional limitations. There is thus an urgent need to find out whether *natural limits to the growth in regulations* exist, whose workings may then be supported by appropriate (indirect) constitutional rules. In order to find such rules, it is necessary to know the characteristics of such endogenous processes restricting public regulations. More research is needed, and with this demand the paper might end. Instead, an attempt is made to analyse *one* specific process which is conceived to limit the growth of public regulations. The analytical model constructed concentrates on the possibility to *exit*, that is, to evade regulations by moving to an unregulated (or less regulated) sector. For this reason, *voice* in the form of reactions by the (over)-regulated voters and interest groups via the political process is disregarded here.

NATURAL LIMITS TO REGULATIONS

Intensity and range of regulations

It is essential to distinguish clearly two concepts: the *intensity* with which a given sector of economic and social activities is regulated and the range of the regulations. An example of the former can be taken from the building industry. The construction of private residences may be controlled by dozens, hundreds or even thousands of public regulations which restrict the freedom with respect to *how* the building activity is to be undertaken: for instance, concerning the noise and pollution emission, the composition of the workforce (no children, certain shares of minorities), the condition of the work (health and security standards, etc.), the suppliers (a certain share of local firms), etc. The regulations on the construction of private residences also refer to how the *final product* has to look: for instance, concerning the type, shape, size and height of the building, the colour, the size of the surrounding garden, etc. What is relevant is the *actual* application of the regulations, and not how they should be applied according to the statute of the law. Many regulations formally exist, but are never applied, others are applied leniently, and yet others are applied strictly. This unequal degree of application is reflected in the punishment an individual or firm subjectively expects when disregarding regulations. A highly expected punishment *ceteris paribus* points to a high degree of strictness of application, and the reverse. The striking impression is that the intensity with which economic production (and consumption) activities are regulated *varies* greatly *between sectors*. The *intensity* with which a sector is publicly regulated is an operational and empirically measurable concept.

The *range* of regulation states how large the area of economic and social activities is in which the regulations are applied. Some of the regulations apply to all kinds of economic activities (for example, the health and security requirements, the prohibition of child labour).[5] Other regulations extend to a limited economic sector only. For instance, certain hygienic regulations apply to the restaurant business, but not to other areas. Similarly, the absolute prohibition of alcohol applies to certain activities (especially to professional driving), but not to others. One area in which (almost by definition) no public regulations apply is the shadow or underground economy, and in a more limited way also the various kinds of 'grey' activities in the rapidly growing 'informal' sector.[6] The *range* of regulations is an operational concept, in principle accessible to measurement.

There is a crucial difference between the intensity and the range of regulation with respect to economic policy. The intensity is an *instrument* in the hands of the government (and its bureaucracy). Within its political possibilities it can issue the number of regulations formally applying to a particular economic sector, and it can (to a large extent) control the *actual*

degree of application by allocating resources to discovering and punishing those disregarding the regulation. The range in which the regulations apply, on the other hand is *not* an instrument of the government. The range of application is rather controlled by the individuals and firms, who can choose whether they observe the regulations and stay in the official economy, or whether they undertake the same activity in the unregulated (or unofficial) economy, and risk punishment. If they choose to move into the unofficial economy, the range in which the regulations apply shrinks.

The '*total amount*' *of regulation* R is a function of both the intensity ϱ and the range B^R of regulation. When either the intensity of application is zero, *or* the range of application is zero (that is, all activity takes place in the unofficial economy), regulation is defined to be non-existent, which means that the functional relationship is multiplicative. The simplest formulation is:

$$R = \varrho B^R \tag{1}$$

but one could also think of:

$$R = \varrho^{\alpha}(B^R)^{\beta} \qquad \alpha,\beta > 0 \tag{1a}$$

which allows us to give relatively more weight to the intensity or to the range of regulation.

The analogy to taxation is obvious: regulatory intensity corresponds to the tax rate τ, the range of regulation to the tax base B^T, and the amount of regulation to tax revenue T:

$$T \equiv \tau B^T \tag{2}$$

Equations (1) and (2), however, are not identical, because the tax revenue is *independently observable* from τ and B^T, whereas the amount of regulation R is not. It is only measurable once ϱ and B^R (and in the case of equation (1a) α and β) are known.

A politico-economic model of regulation

A simple model is constructed consisting of two sets of decision-makers, the government and the individuals/firms. It will be shown that their interaction produces an *endogenous limit* to *regulation* as well as to *taxation*. The formal model closely follows parts of Frey and Ramser (1983).

Government

For our purpose the government is taken as a homogenous unit, including the public bureaucracy. It maximizes its own utility subject to the constraints imposed from outside. Its time horizon is limited, it maximizes myopicly over

a time period which depends on the exogenously given election period. The government derives utility from the amount of regulation R which it can impose on the private economy: its influence over the private economy (and society) rises when the intensity of regulation, as well as when the range over which its 'commands' are observed, are increased. Government and its bureaucracy enjoy wielding this power. In some cases, especially in developing countries, an increase in regulations also means that its monetary income rises, because the individuals and firms active in the private (official) sector resort to corrupting politicians and public officials in order to reach their goals more effectively and more quickly. The government's utility is also positively related to the size of tax revenues T: this command over resources can be used for private purposes or to wield power by spending it in a politically appropriate way. As usual, there are diminishing returns:

$$U = U(R,T)$$
$$U_R, U_T > 0;\ U_{RT} \leq 0;\ U_{RR},\ U_{TT} < 0 \qquad (3)$$

The government simultaneously uses the two instruments at its disposal, the intensity of regulation ϱ and the tax rate τ, to maximize its utility subject to the constraints imposed by equations (1) and (2):

$$\max_{\varrho,\tau} U(R,T) \qquad (4)$$

subject to:

$$R = \varrho B^R \qquad (1)$$
$$T = \tau B^T \qquad (2)$$

Private sector

The individuals and the firms in the private sector have an incentive to evade the official economy, when the burden imposed on them by the government rises. When the intensity of regulation ϱ is raised, individuals and firms will increasingly move to the unregulated unofficial economy, that is, the range of regulation B^R falls. The 'regulation-evasion function' reads:

$$B^R = B^R(\varrho) \qquad \delta B^R/\delta\varrho \equiv B^R_\varrho > 0 \qquad (5)$$

Similarly, when the tax rate τ is raised, individuals and firms have an incentive to move into the untaxed unofficial economy, that is, the tax base B^T falls. The 'tax-evasion function' reads:

$$B^T = B^T(\tau) \qquad \delta B^T/\delta\tau \equiv B^T_\tau < 0 \qquad (6)$$

For simplicity, the unregulated and the untaxed unofficial economy will be identified so that there is only one range B over which both tax rates and regulation intensity apply:

$$B = B^R = B^T \tag{7}$$

The range of regulation and taxation B according to equations (5) and (6) depends on the intensities of regulation ϱ and of taxation τ:

$$B = B(\varrho, \tau) \tag{8}$$

Individuals and firms, however, are not able to adjust to a new intensity of regulation and taxation immediately. They have organized their economic production activity and their consumption life-style on the basis of a historically given regulatory intensity ϱ_0 and tax rate τ_0. They can be thought of as the traditional or expected burden to which the individuals and firms are accustomed. The effect of raising these two intensities on the range has a short-run component depending on the differences $(\varrho - \varrho_0)$ and $(\tau - \tau_0)$ and a long-run component depending on ϱ and τ. For simplicity, it is assumed that these effects are additively separable:

$$\begin{aligned} B &= B(\varrho, \tau, \varrho_0, \tau_0) \\ &= B^s(\varrho - \varrho_0, \tau - \tau_0) + B^l(\varrho, \tau) \end{aligned} \tag{9}$$

Taking account of (1), the amount of regulation is also composed of a short-run R^s and a long-run R^l component:

$$R = R^s(\varrho, \tau, \varrho - \varrho_0, \tau - \tau_0) + R^l(\varrho, \tau) \tag{10}$$

Accordingly, taking account of equation (2), the short-run T^s and long-run T^l components of tax revenue are:

$$T = T^s(\varrho, \tau, \varrho - \varrho_0, \tau - \tau_0) + T^l(\varrho, \tau) \tag{11}$$

Interaction between government and private sector

The behaviour of individuals and firms reacting to regulation and taxation, and the behaviour of the government which pursues its own utility, produces an internal optimum for the government's short-run maximization problem[7] given by $(\varrho^*, \tau^*) > 0$ (with ϱ_0 and τ_0 kept constant). The necessary and sufficient conditions for the optimal instrument use is:

$$R_i^l(\varrho^*, \tau^*) + \gamma T_i^l(\varrho^*, \tau^*) = [R_i^s(\varrho^*, \varrho^* - \varrho_0, \tau^* - \tau_0) + \gamma T_i^s(\tau^*, \varrho^* - \varrho_0, \tau^* - \tau_0)] < 0$$

with

$$\gamma \equiv U_T / U_R > 0 \qquad i = \varrho, \tau \tag{12}$$

This equation shows that a utility-maximizing government sets its instruments ϱ and τ higher than would in the long run maximize the sum of the

(utility-weighted) power of regulation and taxation ($R_i^J + \gamma T_i^J < 0$). Compared to this long-run maximum (when $R_i^J + \gamma T_i^J = 0$), the government, which is only interested in the short-run election period, in general both 'over-regulates' and 'overtaxes'. However, there is an endogenous finite limit to both *regulation* and *taxation*, as there exists a unique internal optimum given by (ϱ^*, τ^*): the government has no incentive to extend the intensity of regulation and taxation too far, because the individuals and firms react by moving into the unofficial economy. There is no point in the government pushing through high intensities of regulation and taxation, if the range over which they are applied shrinks more and more. This is, of course, a variant of the old principle that it is irrational to kill the goose that lays the golden egg.

In the long run, the initial intensities of regulation and taxation (ϱ_0, τ_0) to which the individuals and firms are accustomed are gradually adjusted to the current levels. This adjustment creates cost: the individuals and firms have to search for new ways to get around regulations and to evade taxes. They have, for instance, to hire tax consultants to find out ways to save taxes when the government imposes higher tax rates. It is reasonable to assume that there are increasing marginal costs of adjustment, because it becomes more and more difficult to find ways to evade taxation and regulation. The adjustment cost function is:

$$C = C(\dot{\varrho}_0, \dot{\tau}_0) \tag{13}$$

with

$$C_{\dot{\varrho}_0} > 0,\ C_{\dot{\tau}_0} > 0,\ C_{\dot{\varrho}_0\dot{\varrho}_0} > 0,\ C_{\dot{\tau}_0\dot{\tau}_0} > 0$$

For simplicity, it is assumed that the cost of adjusting to regulation is independent of the cost of adjusting to taxation, that is, the cost function is taken to be additively separable:

$$C(\dot{\varrho}_0, \dot{\tau}_0) = C^{\varrho}(\dot{\varrho}_0) + C^{\tau}(\dot{\tau}_0) \tag{14}$$

It follows that the adjustment process can be described by an adaptive formulation:

$$\dot{\varrho}_0 = \delta^{\varrho}(\varrho - \varrho_0) \tag{15}$$
$$\dot{\tau}_0 = \delta^{\tau}(\tau - \tau_0) \tag{16}$$

with

$$\delta^{\varrho}, \delta^{\tau} \text{ constant } 0$$

Using the short-run optimal values of the instruments:

$$\varrho = \varrho^* = \psi^{\varrho}(\varrho_0, \tau_0) \tag{17}$$
$$\tau = \tau^* = \psi^{\tau}(\varrho_0, \tau_0) \tag{18}$$

it follows that:

$$\lim_{t\to\infty} \dot{\varrho}_0 = \lim_{t\to\infty} \dot{\tau}_0 = 0$$
$$\lim_{t\to\infty} (\varrho^*, \tau^*) = (\varrho^{**}, \tau^{**}) \tag{19}$$

where (ϱ^{**},τ^{**}) are the *long-run* optimal intensities of regulation and taxation. They are the solution of:

$$R_i^l(\varrho^*,\tau^*) + \gamma T_i^l(\varrho^*,\tau^*) = -\left[R_i^s(\varrho^*,0,0) + \gamma T_i^s(\tau^*,0,0)\right] < 0 \qquad i = \varrho,\tau \tag{20}$$

Equation (19) tells us that the short-run optimal intensities (ϱ^*,τ^*) converge to the long-run optimal intensities (ϱ^{**},τ^{**}). Equation (20) tells us that in the long run (that is, when the individuals and firms have adjusted their customary notion of the 'normal' intensity of regulation and taxation to the actual intensity), there is – as is also in the short run – both 'over-regulation' and 'overtaxation'. However, there is again an *endogenous finite limit* to regulation and taxation.

TOWARDS TESTABLE PROPOSITIONS

The relationships established

Given the assumptions of the model constructed, in particular that the government maximizes its utility depending on the amount of regulation and tax revenue, that it acts myopicly and that the cost of adjustment of individuals and firms to new intensities of regulation and taxation can be described by an adaptive process, it has been shown that the amount of 'over-regulation' $(\varrho^{**} - \bar{\varrho})$ and of 'overtaxation' $(\tau^{**} - \bar{\tau})$ depends on the relationship between the *range* and the *intensity* of the burdens imposed by the government:

$$B = B(\varrho,\tau,\varrho_0,\tau_0) \tag{9}$$

Of special interest are the derivatives of this function, especially B_ϱ and B_τ. Once this function is empirically known, it is possible to calculate the amount of 'over-regulation' and 'overtaxation' from functions (12) and (20). The size of 'overburdening' can then be related to observable characteristics of the economy and society, and it can then be empirically tested whether these testable propositions can be maintained or are rejected by the empirical evidence.

Existing evidence

The range of function (9) has so far not been empirically established. There is some knowledge on the *partial* relationships:

$$B^R = B^R(\varrho) \tag{5}$$
$$B^T = B^T(\tau) \tag{6}$$

In the context of the Laffer curve, empirical tests have been undertaken to (indirectly) establish the *tax-range equation* (6), by estimating

$$T = T(\tau, \ldots\ldots) \tag{21}$$

Examples are provided, for instance, by Stuart (1981) or Fullerton (1981). Although it has been taken into account that the effect of the tax rate τ on tax revenue T depends on many factors (indicated by the points in equation (21), the (possible) interdependence with the intensity of regulation (as indicated in equation (9) has been neglected.

Very little is known about the *regulation-range equation* (5). In the data collected on regulation, insufficient attention has been paid to the crucial distinction between the intensity and the range of regulation. Some indicators, such as the number of regulatory legislations, can be interpreted to relate to regulation intensity, whereas other indicators, such as expenditure on regulatory activity and the number of public officials engaged in regulatory activity (see Christainsen and Haveman, 1981), rather stand for the total amount of regulation R. Both indicators may be expected to increase when either regulatory intensity ϱ and/or the range B^R increase.

The main shortcoming of the empirical research on regulation for the purpose at hand is that no effort has been made to determine to which range of economic activities such regulations apply. It clearly should make a difference if, for instance, a bureaucrat produces a certain amount of regulation R which relates intensively to a small area (large ϱ, small B^R) or slightly over the whole economy (small ϱ, large B^R). An important task for future empirical work is therefore to collect data on regulation, distinguishing between the intensity and the range of economic activities to which they apply.

Framework for data collection

In the model constructed, the simple case of an official economy with regulation and taxation, and an unregulated and untaxed unofficial economy

Table 6.2 *Regulation according to type and economic sector of application*

	Type of regulation				
Economic sectors	*Health*	*Environment*	*Work conditions*	*Etc.*	*Total regulation*
Agriculture					
Construction					
Services					
Etc.					
Whole economy					X

was considered. In empirical work it is necessary to distinguish according to the *type of regulation* (for example, for health, environment, on working conditions) and according to the *economic sector* (for example, agriculture, construction, services) to which they apply. This gives a matrix as shown in table 6.2. This matrix can be filled either by the intensity of regulation (ϱ_{sj}), where s represents the economic sector and j the types of regulation) or by the range, indicated for example by the size of the official to the unofficial economy (B_{sj}). The cell indicated by X then either shows the aggregate intensity ϱ or range B of regulation.

Estimating the regulatory-range function

The data collected in table 6.2 provide the basis for estimating the $B^R(\varrho)$ function, either by cross-section or time series. The parameters of the regulatory-range function can be determined by comparing the relationship of the size of the regulatory range and regulatory intensity *across economic sectors*, for a specific type of regulation or for overall regulation. If the data of the matrix are known for various years, it is possible to determine the dependence of the range of regulation on the intensity of regulation by running a regression *over time*, either for a specific type of regulation or for overall regulation. The time-series approach makes it possible to analyse the time structure of an increase in regulatory intensity on the range. The cross-section and time-series approaches can of course also be pooled. In each case, further variables influencing the size of the regulatory range, in particular the intensity of taxation (tax rates), must be taken into account in order not to mis-specify the estimation equation.

Such estimates are so far not possible because of the lack of data. Some preliminary attempts have been made in the context of the research on the shadow economy. In a pooled cross-section/time-series study of the relative size of the shadow economy in OECD countries, using the 'hidden variable' approach, Frey and Weck (1984) have found that both an increase in the intensity of regulation and taxation raise the size of the shadow economy in a statistically significant way. Using the (somewhat questionable) transaction approach (Feige, 1979) to measure the size of the shadow economy, Haveman *et al.* (1983) also find that the intensity of regulation and of taxation has a statistically significant influence. Both studies suggest[8] that the range of regulation and taxation (that is, the size of the official economy) is negatively related to the burden imposed on the individuals and firms by the government.

Testable propositions

Knowledge of the range of regulation and taxation function $B(\varrho,\tau,\ldots)$ allows one to calculate by how much the actual regulation intensity exceeds the long-run maximizing level ($\varrho^{**} - \sim \varrho$), and by how far actual tax rates exceed the

long-run revenue-maximizing tax rates ($\tau^{**} - \tilde{\varrho}$), assuming that the politico-economic model constructed is constant with reality. Testable hypotheses can then be formulated which indicate on what *structural conditions* these deviations of actual from long-run maximizing intensities depend, or, in other words, on what point of the range in function (9) a specific country is expected to be at a particular point of time. In general, it can be expected that the negative effect of regulation and taxation on the size of the official economy (the range) will be stronger, the more *possibility* there is to exit to the unofficial economy. In particular, the deviations ($\varrho^{**} - \tilde{\varrho}$) and ($\tau^{**} - \tau$) will be smaller in the following sets of circumstances.

1. The *smaller* the units of government are to which a particular type of regulation and taxation applies. *Ceteris paribus*, in *federalist* countries, and in *small* countries, the intensity of regulation and taxation will be smaller than in unitary and large countries. To give an example, the regulations on sex and gambling which Switzerland imposes are relatively weak, because the Swiss can easily obtain the respective less regulated services just across the border in Lindau, Konstanz or Campione.
2. The *smaller* the *transaction costs* that are involved in switching to a less regulated and less taxed sector. In areas of economic activity in which *information* on similar or identical less regulated activities is easily available or is even advertised (as in the case of prostitution and gambling), and/or where the *transportation* costs of the switch are low, there will, *ceteris paribus*, be low regulation and taxation.
3. The *higher* the punishment is which the individuals and firms expect when they switch to the unofficial economy.

SUMMARY

Our discussion has led to the following conclusions:

1. There is much knowledge about the national and constitutional limits to *taxation*. There is considerable knowledge about the natural limits to *public expenditure*, and some knowledge about the constitutional limits to public expenditure.
2. Next to nothing is known about the limits to *regulation*. Regulation, however, is an important part of public activity, and will gain importance when, and in so far as, the limits to taxation and public expenditure become effective.
3. *Natural* limits to *regulation* do exist. It is necessary to distinguish between the intensity and the range of regulations: a rise in intensity of regulation leads to a decrease in the range to which the regulations are applied. A utility-maximizing government will generally over-regulate compared to the intensity of regulation which maximizes the 'amount' of regulation,

but there is a definite endogenous limit to regulation intensity (and to the total 'amount' of regulation) above which the government would be irrational to go.

4. The intensity of regulation will be high in those areas where the elasticity of evasion is low, and it will be low where the elasticity is large.
5. Testable propositions about the limits of regulation are possible when the conditions determining the elasticity of the regulation evasion function are identified. Such conditions are the kind of government intervention, the alternatives for less regulated and unregulated activities, and the extent to which the formal regulations are in fact observed.

NOTES

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1 In the last two years there has been much research on the shadow economy. See, for example, Tanzi (1982) and the survey by Frey and Pommerehne (1985).

2 Presumably, the government's time horizon equals the length of the election period (that is, around four years for a newly elected or re-elected government), an assumption also made in the literature on the political business cycle based on Nordhaus (1975). This assumption is, however, doubtful, because the government's time horizon certainly depends on how likely it evaluates its re-election prospects to be: if it is confident of winning the forthcoming election, its time horizon will at least extend over the following election period (that is, will be around eight years for a new government). For a formal presentation of this endogenous theory of the time horizon, see Frey and Ramser (1976).

3 Tabb (1980) has reminded us that government regulations not only impose costs, but may also provide benefits. Schwarz (1983) has shown that Weidenbaum's conclusions about the *increase* in the costs of regulations are deficient. If instead of an overall 'multiplier' (stating that the total cost of regulations are twenty times their administration cost) a sector-specific multiplier is used, no increase can be found because the sectors with highest multipliers grow less rapidly.

4 Very indirectly, the following limiting process could be constructed: when the number of public regulations increases, private-sector productivity falls, which reduces the government's ability to finance its expenditure. If this results in a reduction in the number of public employees, less public regulations per year will be issued. This construction is rather tenuous: although, there exists empirical evidence that rising public regulations lead to a decrease in private productivity (Christainsen and Haveman (1981) estimate, for instance, that federal regulations are responsible for between 12 and 21 per cent of the slowdown in the growth of labour productivity in US manufacturing during 1973–7 as compared to 1958–65; for environmental regulation see Gollup and Roberts (1983)), it is not

necessarily true at all that this results in a decrease in government expenditure and employees.

5 With the exception, of course, of professional sports such as ice skating, swimming or gymnastics, where child labour is extensively, if not exclusively, used.

6 For simplicity, in the following only two sectors are distinguished: one in which the regulations hold and another where they do not hold, which will be called 'official' and 'unofficial' sectors, respectively.

7 The algebraic model of the two (sets of) decision-makers and two time periods is similar to Buchanan and Lee's (1982) geometrical model. They use it to derive 'overtaxation', a position which is not generally true, as shown in Frey and Ramser (1983).

8 Because of the unsatisfactory measurement of regulation, the results should be accepted with caution.

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