4.1 Introduction

The statistics of chapter 3 have described the size, growth, and composition of the public sector in a range of developed and developing countries. The data illustrated that the pattern of growth was similar across countries, as was the composition of expenditure. Although there is some divergence in the size of the public sector, it is significant in all the countries. Such observations raise two interrelated questions. First, why is there a public sector at all—would it not be possible for economic activity to function satisfactorily without government intervention? Second, is it possible to provide a theory that explains the increase in size of the public sector and the composition of expenditure? The purpose of this chapter is to consider possible answers to these questions.

The chapter begins with a discussion of the justifications that have been proposed for the public sector. These show how the requirements of efficiency and equity lead to a range of motives for public sector intervention in the economy. Alternative explanations for the growth in the size of the public sector are then assessed. As a by-product, they also provide an explanation for the composition of expenditure. Finally, some economists would argue that the public sector is excessively large. Several arguments for why this may be so are considered.

4.2 Justification for the Public Sector

Two basic lines of argument can be advanced to justify the role of the public sector. These can be grouped under the headings of efficiency and equity. Efficiency relates to arguments concerning the aggregate level of economic activity, whereas equity refers to the distribution of economic benefits. In considering these arguments, it is natural to begin with efficiency since this is essentially the more fundamental concept.

4.2.1 The Minimal State

The most basic motivation for the existence of a public sector follows from the observation that entirely unregulated economic activity cannot operate in a very sophisticated way. In short, an economy would not function effectively if there
were no *property rights* (the rules defining the ownership of property) or *contract laws* (the rules governing the conduct of trade).

Without property rights, satisfactory exchange of commodities could not take place given the lack of trust that would exist between contracting parties. This argument can be traced back to Hobbes, who viewed the government as a social contract that enables people to escape from the anarchic “state of nature” where their competition in pursuit of self-interest would lead to a destructive “war of all against all.” The institution of property rights is a first step away from this anarchy. In the absence of property rights, it would not be possible to enforce any prohibition against theft. Theft discourages enterprise, since the gains accrued may be appropriated by others. It also results in the use of resources in the unproductive business of theft prevention.

Contract laws determine the rules of exchange. They exist to ensure that the participants in a trade receive what they expect from that trade or, if they do not, have open an avenue to seek compensation. Examples of contract laws include the formalization of weights and measures and the obligation to offer product warranties. These laws encourage trade by removing some of the uncertainty in transactions.

The establishment of property rights and contract laws is not sufficient in itself. Unless they can be policed and upheld in law, they are of limited consequence. Such law enforcement cannot be provided free of cost. Enforcement officers must be employed and courts must be provided in which redress can be sought. In addition an advanced society also faces a need for the enforcement of more general criminal laws. Moving beyond this, once a country develops its economic activity, it will need to defend its gains from being stolen by outsiders. This implies the provision of defense for the nation. As the statistics made clear, national defense has at times been a very costly activity.

Consequently, even if only the minimal requirements of the enforcement of contract and criminal laws and the provision of defense are met, a source of income must be found to pay for them. This need for income requires the collection of revenue, whether these services are provided by the state or by private sector organizations. But they are needed in any economy that wishes to develop beyond the most rudimentary level. Whether it is most efficient for a central government to collect the revenue and provide the services could be debated. Since there are some good reasons for assuming this is the case, the coordination of the collection of revenue and the provision of services to ensure the attainment of efficient functioning of economic activity provides a natural role for a public sector.
This reasoning illustrates that to achieve even a most minimal level of economic organization, some unavoidable revenue requirements are generated and require financing. From this follows the first role of the public sector, which is to assist with the attainment of economic efficiency by providing an environment in which trade can flourish. The minimal state provides contract law, polices it, and defends the economy against outsiders. The minimal state does nothing more than this, but without it organized economic activity could not take place. These arguments provide a justification for at least a minimal state and hence the existence of a public sector and of public expenditure.

Having concluded that the effective organization of economic activity generates a need for public expenditure, one role for public economics is to determine how this revenue should be collected. The collection should be done with as little cost as possible imposed on the economy. Such costs arise from the distortion in choice that arise from taxation. Public economics aims to understand these distortions and to describe the methods of minimizing their impact.

4.2.2 Market versus Government

Moving beyond the basic requirements for organized economic activity, there are other situations where intervention in the economy can potentially increase welfare. Unlike the minimal provision and revenue requirements however, there will always be a degree of contentiousness about additional intervention whatever the grounds on which it is motivated. The situations where intervention may be warranted can be divided into two categories: those that involve market failure and those that do not.

When market failure is present, the argument for considering whether intervention would be beneficial is compelling. For example, if economic activity generated externalities (effects that one economic agent imposes on another without their consent), so that there is divergence between private and social valuations and the competitive outcome is not efficient, it may be felt necessary for the state to intervene to limit the inefficiency that results. This latter point can also be extended to other cases of market failure, such as those connected to the existence of public goods and of imperfect competition. Reacting to such market failures is intervention motivated on efficiency grounds.

It must be stressed that this reasoning does not imply that intervention will always be beneficial. In every case it must be demonstrated that the public sector actually has the ability to improve on what the unregulated economy can achieve.
This will not be possible if the choice of policy tools is limited or government information is restricted. It will also be undesirable if the government is not benevolent. These various imperfections in public intervention will be a recurrent theme of this book.

While some useful insights follow from the assumption of an omnipotent, omniscient, and benevolent policy-maker, in reality it can give us very misleading ideas about the possibilities of beneficial policy intervention. It must be recognized that the actions of the state, and the feasible policies that it can choose, are often restricted by the same features of the economy that make the market outcome inefficient. One role for public economics is therefore to determine the desirable extent of the public sector or the boundaries of state intervention. For instance, if we know that markets will fail to be efficient in the presence of imperfect information, to establish the merit of government intervention it is crucial to know if a government subject to the same informational limitations can achieve a better outcome.

Furthermore a government managed by nonbenevolent officials and subject to political constraints may fail to correct market failures and may instead introduce new costs of its own creation. It is important to recognize that this potential for government failure is as important as market failure and that both are often rooted in the same informational problems. At a very basic level the force of coercion must underlie every government intervention in the economy. All policy acts take place, and in particular, taxes are collected and industry is regulated, with this force in the background. But the very power to coerce raises the possibility of its misuse. Although the intention in creating this power is that its force should serve the general interest, nothing can guarantee that once public officials are given this monopoly of force, they will not try to abuse this power in their own interest.

4.2.3 Equity

In addition to market failure, government intervention can also be motivated by the observation that the economy may have widespread inequality of income, opportunity, or wealth. This can occur even if the economy is efficient in a narrow economic sense. In such circumstances the level of economic welfare as viewed by the government may well be raised by a policy designed to alleviate these inequalities. This is the reasoning through which the provision of state education, social security programs, and compulsory pension schemes are justified. It should be stressed that the gains from these policies are with respect to normative assess-
ments of welfare, unlike the positive criterion lying behind the concept of economic efficiency.

In the cases of both market failure and welfare-motivated policies, policy intervention concerns more than just the efficient collection of revenue. The reasons for the failure of the economy to reach the optimal outcome have to be understood, and a policy that can counteract these has to be designed. Extending the scope of the public economics to address such issues provides the breadth to the subject.

4.2.4 Efficiency and Equity

When determining economic policy, governments are faced with two conflicting aims. All governments are concerned with organizing economic activity so that the best use is made of economic resources. This is the efficiency side of policy design. To varying degrees, governments are also concerned to see that the benefits of economic activity are distributed fairly. This is the equity aspect of policy design.

The difficulty facing the government is that the requirements of equity and efficiency frequently conflict. It is often the case that the efficient policy is highly inequitable, while the equitable policy can introduce significant distortions and disincentives. Given this fact, the challenge for policy design is to reach the correct trade-off between equity and efficiency. Quite where on the trade-off the government should locate is dependent on the relative importance it assigns to equity over efficiency.

In this context it is worth adding one final note concerned with the nature of the arguments often used in this book. A standard simplification is to assume that there is a single consumer or that all consumers are identical. In such a setting there can be no distributional issues, so any policy recommendations derived within it relate only to efficiency and not to equity. The reason for proceeding in this way is that it usually permits a much simpler analysis to be undertaken and for the conclusions to be much more precise. When interpreting such conclusions in terms of practical policy recommendations, their basis should never be overlooked.

4.3 Public Sector Growth

The data of chapter 3 showed quite clearly the substantial growth of the public sector in a range of countries during the past century. There are numerous theories that have been advanced to explain why this has occurred. These differ in
their emphasis and perspective and are not mutually exclusive. In fact it is reason-
able to argue that a comprehensive explanation would involve elements drawn
from all.

4.3.1 Development Models

The basis of the development models of public sector growth is that the economy
experiences changes in its structure and needs as it develops. Tracing the nature
of the development process from the beginning of industrialization through to the
completion of the development process, a story of why public sector expenditure
increases can be told.

It is possible to caricature the main features of this story in the following way:
The early stage of development is viewed as the period of industrialization during
which the population moves from the countryside to the urban areas. To meet the
needs that result from this, there is a requirement for significant infrastructural
expenditure in the development of cities. The typically rapid growth experienced
in this stage of development results in a significant increase in expenditure and the
dominant role of infrastructure determines the nature of expenditure.

In what are called the middle stages of development, the infrastructural expen-
diture of the public sector becomes increasingly complementary with expenditure
from the private sector. Developments by the private sector, such as factory con-
struction, are supported by investments from the public sector, such as the build-
ing of connecting roads. As urbanization proceeds and cities increase in size, so
does population density. This generates a range of externalities such as pollution
and crime. An increasing proportion of public expenditure is then diverted away
from spending on infrastructure to the control of these externalities.

Finally, in the developed phase of the economy, there is less need for infrastruc-
tural expenditure or for the correction of market failure. Instead, expenditure is
driven by the desire to react to issues of equity. This results in transfer payments,
such as social security, health, and education, becoming the main items of expen-
diture. Of course, once such forms of expenditure become established, they are
difficult to ever reduce. They also increase with heightened expectations and
through the effect of an aging population.

Although this theory of the growth of expenditure concurs broadly with the
facts, it has a number of weaknesses. Most important, it is primarily a description
rather than an explanation. From an economist’s perspective, the theory is lack-
ing in that it does not have any behavioral basis but is essentially mechanistic.
What an economist really would wish to see is an explanation in which expenditure is driven by the choices of the individuals that constitute the economy. In the development model the change is just driven by the exogenous process of economic progress. Changes in expenditure should be related to how choices change as preferences or needs evolve over time.

### 4.3.2 Wagner’s Law

Adolph Wagner was a nineteenth-century economist who analyzed data on public sector expenditure for several European countries, Japan, and the United States. These data revealed the fact that was shown in chapter 3: the share of the public sector in gross domestic product had been increasing over time. The content of Wagner’s law was an explanation of this trend and a prediction that it would continue. In contrast to the basic developments models, Wagner’s analysis provided a theory rather than just a description and an economic justification for the predictions.

The basis for the theory consists of three distinct components. First, it was observed that the growth of the economy results in an increase in complexity. Economic growth requires continual introduction of new laws and the development of the legal structure. Law and order imply continuing increases in public sector expenditure. Second, there was the process of urbanization and the increased externalities associated with it. These two factors have already been discussed in connection with the development models.

The final component underlying Wagner’s law is the most behavioral of the three and is what distinguishes it from other explanations. Wagner argued that the goods supplied by the public sector have a high income elasticity of demand. This claim appears reasonable, for example, for education, recreation, and health care. Given this fact, as economic growth raises incomes, there will be an increase in demand for these products. In fact from a high elasticity it can be inferred that public sector expenditure does rise as a proportion of income. This conclusion is the substance of Wagner’s law. There have been many attempts at establishing whether Wagner’s law is empirically valid. The problem that surfaces in all of these tests is how to disentangle the causality between public expenditure and the level of income. Wagner’s law proposes that it is income that explains expenditure. In contrast, there is much macroeconomic theory in favor of the argument that government spending explains the level of income—this was the essential insight of Keynesian economics. Tests to date have not convincingly resolved this issue.
In many ways Wagner’s law provides a good explanation of public sector growth. Its main failing is that it concentrates solely on the demand for public sector services. What must determine the level is some interaction between demand and supply. The supply side is explicitly analyzed in the next model.

4.3.3 Baumol’s Law

Rather than work from the observed data, Baumol’s law starts from an observation about the nature of the production technology in the public sector. The basic hypothesis is that the technology of the public sector is labor-intensive relative to that of the private sector. In addition the type of production undertaken leaves little scope for increases in productivity and that makes it difficult to substitute capital for labor. As examples, hospitals need minimum numbers of nurses and doctors for each patient, and maximum class sizes place lower limits on teacher numbers in schools.

Competition on the labor market ensures that labor costs in the public sector are linked to those in the private sector. Although there may be some frictions in transferring between the two, wage rates cannot be too far out of line. However, in the private sector it is possible to substitute capital for labor when the relative cost of labor increases. Furthermore technological advances in the private sector lead to increases in productivity. These increases in productivity result in the return to labor rising. The latter claim is simply a consequence of optimal input use in the private sector resulting in the wage rate being equated to the marginal revenue product.

Since the public sector cannot substitute capital for labor, the wage increases in the private sector feed through into cost increases in the public sector. Maintaining a constant level of public sector output must therefore result in public sector expenditure increasing. If public sector output/private sector output remain in the same proportion, public sector expenditure rises as a proportion of total expenditure. This is Baumol’s law, which asserts the increasing proportional size of the public sector.

There are a number of problems with this theory. It is entirely technology-driven and does not consider aspects of supply and demand or political processes. There are also reasons for believing that substitution can take place in the public sector. For example, additional equipment can replace nurses, and less qualified staff can take on more mundane tasks. Major productivity improvements have also been witnessed in universities and hospitals. Finally, there is evidence of a
steady decline in public sector wages relative to those in the private sector. This reflects lower skilled labor being substituted for more skilled.

### 4.3.4 A Political Model

A political model of public sector expenditure needs to capture the conflict in public preferences between those who wish to have higher expenditure and those who wish to limit the burden of taxes. It must also incorporate the resolution of this conflict and show how the size and composition of actual public spending reflects the preferences of the majority of citizens as expressed through the political process. The political model we now describe is designed to achieve these aims. The main point that emerges is that the equilibrium level of public spending can be related to the income distribution, and more precisely that the growth of government is closely related to the rise of income inequality.

To illustrate this, consider an economy with $H$ consumers whose incomes fall into a range between a minimum of 0 and a maximum of $\bar{y}$. The government provides a public good that is financed by the use of a proportional income tax. The utility of consumer $i$ who has income $y_i$ is given by

$$u_i(t, G) = [1 - t]y_i + b(G),$$

(4.1)

where $t$ is the income tax rate and $G$ the level of public good provision. The function $b(\cdot)$ represents the benefit obtained from the public good and it is assumed to be increasing (so the marginal benefit is positive) and concave (so the marginal benefit is falling) as $G$ increases. We denote by $\mu$ the mean income level in the population of consumers, so the government budget constraint is

$$G = tH\mu.$$  

(4.2)

Using this budget constraint, a consumer with income $y_i$ will enjoy utility from provision of a quantity $G$ of the public good of

$$u_i(G) = \left[1 - \frac{G}{H\mu}\right]y_i + b(G).$$

(4.3)

The ideal level of public good provision for the consumer is given by the first-order condition

$$\frac{\partial u_i(G)}{\partial G} \equiv - \frac{y_i}{H\mu} + b'(G) = 0.$$  

(4.4)
This condition relates the marginal benefit of an additional unit of the public good, $b'(G)$, to its marginal cost $\frac{y_m}{\mu}$. The quantity of the public good demanded by the consumer depends on their income relative to the mean since this determines the marginal cost.

The marginal benefit of the public good has been assumed to be a decreasing function of $G$, so it follows that the preferred public good level is decreasing as income rises. The reason for this is that with a proportional income tax the rich pay a higher share of the cost of public good than the poor. Thus public good provision will disproportionately benefit the poor.

The usual way to resolve the disagreement over the desired level of public good is to choose by majority voting. If the level of public good is to be determined by majority voting, which level will be chosen? In the context of this model the answer is clear-cut because all consumers would prefer the level of public good to be as close as possible to their preferred level. Given any pair of alternatives, consumers will vote for that which is closest to their preferred alternative. The alternative that is closest for the largest number of consumers will receive maximal support. There is in fact only one option that will satisfy this requirement: the option preferred by the consumer with the median income. The reason is that exactly one-half of the electorate, above the median income (the rich), would like less public good and the other half, below the median (the poor), would like more public good. Any alternative that is better for one group would be opposed by the other group with opposite preferences. (We explore the theory of voting in detail in chapter 10.)

The political equilibrium $G^*$, determined by the median voter, is then the solution to

$$b'(G^*) = \frac{y_m}{\mu},$$

(4.5)

where $\frac{y_m}{\mu}$ is the income of the median voter relative to the mean. Since the marginal benefits decrease as public good provision increases, the political equilibrium level of public good increases with income inequality as measured by the ratio of the median to mean income. Accordingly, more inequality as measured by a lower ratio of the median to mean income would lead the decisive median voter to require more public spending.

Government activities are perceived as redistributive tools. Redistribution can be explicit, such as social security and poverty alleviation programs, or it can take a more disguised form like public employment which is probably the main chan-
nel of redistribution from rich to poor in many countries. Because of its nature, and interaction with the tax system, the demand for redistribution will increase as income inequality increases as demonstrated by this political model.

4.3.5 Ratchet Effect

Models of the ratchet effect develop the modeling of political interaction in a different direction. They assume that the preference of the government is to spend money. Explanations of why this should be so can be found in the economics of bureaucracy, which is explored in the next section. For now the fact is just taken as given. In contrast, it is assumed that the public do not want to pay taxes. Higher spending can only come from taxes, so by implication the public partially resists this; they do get some benefit from the expenditure. The two competing objectives are moderated by the fact that governments desire re-election. This makes it necessary for government to take some account of the public’s preferences.

The equilibrium level of public sector expenditure is determined by the balance between these competing forces. In the absence of any exogenous changes or of changes in preferences, the level of expenditure will remain relatively constant. In the historical data on government expenditure, the periods prior to 1914, between 1920 and 1940, and post-1945 can be interpreted as displaying such constancy. Occasionally, though, economies go through periods of significant upheaval such as occurs during wartime. During these periods normal economic activity is disrupted. Furthermore the equilibrium between the government and the taxpayers becomes suspended. Ratchet models argue that wartime permits the government to raise expenditure with the consent of the taxpayers on the understanding that this is necessary to meet the exceptional needs that have arisen.

The final aspect of the argument is that the level of expenditure does not fall back to its original level after the period of upheaval. Several reasons can be advanced for this. First, the taxpayers become accustomed to the higher level of expenditure and perceive this as the norm. Second, debts incurred during the period of upheaval have to be paid off later. This requires the raising of finance. Third, promises made by the government to the taxpayers during periods of upheaval then have to be met. These can jointly be termed ratchet effects that sustain a higher level of spending. Finally, there may occur an inspection effect after an upheaval whereby the taxpayers and government reconsider their positions and priorities. The discovery of previously unnoticed needs then provides further justification for higher public sector spending.
The prediction of the ratchet-effect model is that spending remains relatively constant unless disturbed by some significant external event. These events can trigger substantial increases in expenditure. The ratchet and inspection effects work together to ensure that expenditure remains at the higher level until the next upheaval.

The description of expenditure growth given by this political model is broadly consistent with the data of chapter 3. Before 1914, between 1918 and 1940, and post-1945 the level of expenditure is fairly constant but steps up between these periods. Whether this provides support for the explanation is debatable because the model was constructed to explain these known facts. In other words, the data cannot be employed as evidence that the model is correct, given that the model was designed to explain that data.

4.4 Excessive Government

The theories of the growth of public sector expenditure described above attempt to explain the facts but do not offer comment on whether the level of expenditure is deficient or excessive. They merely describe processes and do not attempt to evaluate the outcome. There are in fact many economists who argue that public sector expenditure is too large and represents a major burden on the economy. While the evidence on this issue is certainly not conclusive, there are a number of explanations of why this should be so. Several are now described that reach their conclusions not through a cost–benefit analysis of expenditure but via an analysis of the functioning of government.

4.4.1 Bureaucracy

A traditional view of bureaucrats is that they are motivated solely by the desire to serve the common good. They achieve this by conducting the business of government in the most efficient manner possible without political or personal bias. This is the idealistic image of the bureaucrat as a selfless public servant. There is a possibility that such a view may be correct. Having said this, there is no reason why bureaucrats should be any different than other individuals. From this perspective it is difficult to accept that they are not subject to the same motivations of self-serving.

Adopting this latter perspective, the theoretical analysis of bureaucracy starts with the assumption that bureaucrats are indeed motivated by maximization of
their private utilities. If they could, they would turn the power and influence that their positions give them into income. But, due to the nature of their role, they face difficulties in achieving this. Unlike similarly positioned individuals in the private sector, they cannot exploit the market to raise income. Instead, they resort to obtaining utility from pursuing nonpecuniary goals. A complex theory of bureaucracy may include many factors that influence utility such as patronage, power, and reputation. However, to construct a basic variant of the theory, it is sufficient to observe that most of these factors can be related to the size of the bureau. The bureaucrat can therefore be modeled as aiming to maximize the size of his bureau in order to obtain the greatest nonpecuniary benefits. It is as a result of this behavior that the size of government becomes excessive.

To demonstrate excessive bureaucracy, let \( y \) denote the output of the bureau as observed by the government. In response to an output \( y \), the bureau is rewarded by the government with a budget of size \( B(y) \). This budget increases as observed output rises \( (B'(y) > 0) \) but at a falling rate \( (B''(y) < 0) \). The cost of producing output is given by a cost function \( C(y) \). Marginal cost is positive \( (C'(y) > 0) \) and increasing \( (C''(y) > 0) \). It is assumed that the government does not know this cost structure—only the bureaucrat fully understands the production process. What restrains the behavior of the bureaucrat is the requirement that the budget received from the government is sufficient to cover the costs of running the bureau.

The decision problem of the bureaucrat is then to choose output to maximize the budget subject to the requirement that the budget is sufficient to cover costs. This optimization can be expressed by the Lagrangian

\[
L = B(y) + \lambda \left[ B(y) - C(y) \right],
\]

where \( \lambda \) is the Lagrange multiplier on the constraint that the budget equals cost. Differentiating the Lagrangian with respect to \( y \) and solving characterizes the optimum output from the perspective of the bureaucrat, \( y^b \), by

\[
B'(y^b) = \frac{\lambda}{\lambda + 1} C'(y^b).
\]

Since the Lagrange multiplier, \( \lambda \), is positive, this expression implies that \( B' < C' \) at the bureaucrat’s optimum choice of output.

We wish to contrast the bureaucracy outcome with the outcome that occurs when the government has full information. With full information there exists a variety of different ways to model efficiency. One way would be to place the bureau within a more general setting and consider its output as one component of overall
government intervention. A benefit–cost calculation for government intervention would then determine the efficient level of bureau output. A simpler alternative, and the one we choose to follow, is to determine the efficient output by drawing an analogy between the bureau and a profit-maximizing firm. The firm chooses its output to ensure that the difference between revenue and costs is made as large as possible. By this analogy, the bureau should choose output to maximize its budget less costs, $B(y) - C(y)$. For the bureau this is the equivalent of profit maximization.

Differentiating with respect to $y$, we equate the marginal effect of output on the budget to marginal cost to determine the efficient output $y^*$. The efficient output satisfies $B'(y^*) = C'(y^*)$. The output level chosen by the bureaucrat can easily be shown to be above the efficient level. This argument is illustrated in figure 4.1. The increasing marginal cost curve and declining marginal benefit curve are consequences of the assumptions already made. The efficient output occurs at the intersection of these curves. In contrast, the output chosen by the bureaucrat satisfies $B'(y^b) < C'(y^b)$, so it must lie to the right of $y^*$. In fact the budget covers costs when the area under the marginal budget curve $a$ equals the area under the marginal cost curve $b$. It is clear from this figure that the size of the bureaucracy is excessive when it is determined by the choice of a bureaucrat.

This simple model shows how the pursuit of personal objectives by bureaucrats can lead to an excessive size of bureaucracy. Adding together the individual

![Figure 4.1](image-url)
bureaus that comprise the public sector makes this excessive in aggregate. This excessive size is simply an inefficiency, since money is spent on bureaus that are not generating sufficiently valuable results.

The argument just given is enticing in its simplicity, but it is restricted by the fact that it is assumed that the bureaucrats have freedom to set the size of the bureau. There are various ways this limitation can be addressed. Useful extensions are to have the freedom constrained by political pressure or through a demand function. Although doing either of these would lessen the excess, the basic moral that bureaucrats have incentives to overly enlarge their bureaus would still remain. Whether they do so in practice is dependent on the constraints placed on them.

4.4.2 Budget-Setting

An alternative perspective on excessive bureaucracy can be obtained by considering a different process of budget determination. A motivation for this is the fact that each government department is headed by a politician who obtains satisfaction from the size of the budget. Furthermore, in many government systems, budgets for departments are determined annually by a meeting of cabinet. This meeting takes the budget bids from the individual departments and allocates a central budget on the basis of these. Providing a model incorporating these points then determines how departments’ budgets evolve over time.

A simple process of this form can be the following: Let the budget for year \( t \) be given by \( B_t \). The budget claim for year \( t + 1 \) is then given by

\[
B^c_{t+1} = (1 + \alpha)B_t, \tag{4.8}
\]

where \( \alpha > 0 \) is the rate at which departments inflate their budget claim. Such a rule represents a straightforward mechanical method of updating the budget claim—last year’s is taken and a little more added. It is, of course, devoid of any basis in efficiency. The meeting of cabinet then takes these bids and proportionately reduces them to reach the final allocation. The agreed budget is written as

\[
B_{t+1} = [1 - \gamma]B^c_{t+1} = [1 - \gamma](1 + \alpha)B_t, \tag{4.9}
\]

where \( 0 < \gamma < 1 \) is the rate at which the cabinet deflates each budget claim. The expression above gives a description of the change in the budget over time.

It can be seen that if \( \alpha > \gamma \), then the budget will grow over time. Its development bears little relationship to needs, so there is every possibility that expenditure
will eventually become excessive even if it initially begins at an acceptable level. When $x < y$, the budget will fall over time. Although either case is possible, the observed pattern of growth lends some weight to the former assumption.

This form of model could easily be extended to incorporate more complex dynamics but not really enhance the content of the simple story it tells. The modeling of budget determination as a process entirely independent of what is good for the economy provides an important alternative perspective on how the public sector may actually function. Even if the truth is not quite this stark, reasoning of this kind does put into context models that are based on the assumption that the government is informed and efficient.

### 4.4.3 Monopoly Power

The basis of elementary economics is that market equilibrium is determined via the balance of supply and demand. Those supplying the market are assumed to be distinct from those demanding the product. In the absence of monopoly power, the equilibrium that is achieved will be efficient. If the same reasoning could be applied to the goods supplied by the public sector, then efficiency would also arise there. Unfortunately, there are two reasons why efficiency is not possible. First, the public sector can award itself a monopoly in the supply of its goods and services. Second, this monopoly power may be extended into market capture.

Generally, a profit-maximizing monopolist will always want to restrict its level of output below the competitive level so that monopoly power will provide a tendency for too little government rather than the converse. This would be a powerful argument were it not for the fact that the government can choose not to exercise its monopoly power in this way. If it is attempting to achieve efficiency, then it will certainly not do so. Furthermore, since the government may not be following a policy of profit maximization, it might actually exploit its monopoly position to oversupply its output. This takes the analysis back in the direction of the bureaucracy model.

The idea of market capture is rather more interesting and arises from the nature of goods supplied by the public sector. Rather than being standard market goods, many of them are complex in nature and not fully understood by those consuming them. Natural examples of such goods would be education and health care. In both cases the consumer may not understand quite what the product is, nor what is best for them. Although this is important, it is also true of many other goods. The additional feature of the public sector commodities is that demand is not
determined by the consumers and expressed through a market. Instead, it is delegated to specialists such as teachers and doctors. Furthermore these same specialists are also responsible for setting the level of supply. In this sense they can be said to capture the market.

The consequence of this market capture is that the specialists can set the level of output for the market that most meets their objectives. Naturally, since most would benefit from an expansion of their profession, within limits, this gives a mechanism that leads to supply in excess of the efficient level. The limits arise because they won’t want to go so far that competition reduces the payment received or lowers standards too far. Effectively, they are reaching a trade-off between income and power, where the latter arises through the size of the profession. The resulting outcome has no grounds in efficiency and may well be too large.

### 4.4.4 Corruption

Corruption does not emerge as a moral aberration but as a general consequence of government officials using their power for personal gain. Corruption distorts the allocation of resources away from productive toward rent-seeking occupations. Rent-seeking (studied in chapter 11) is the attempt to obtain a return above what is judged adequate by the market. Monopoly profit is one example, but the concept is much broader. Corruption is not just redistributive (taking wealth from others to give it to some special interests), it can also have enormous efficiency costs. By discouraging the entrepreneurs on whom they prey, corruptible officials may have the effect of stunting economic growth.

Perhaps the most important form of corruption in many countries is predatory regulation. This is the process by which the government intentionally creates regulations that entrepreneurs have to pay bribes to get around. Because it raises the cost of productive activity, this form of corruption reduces efficiency. The damage is particularly large when several government officials, acting independently, create distinct obstacles to economic activity so that each can collect a separate bribe in return for removing the obstacle (e.g., creating the need for a license and then charging for it). When entrepreneurs face all these independent regulatory obstacles, they eventually cease trying, or else move into the underground economy to escape regulation altogether. Thus corruption is purely harmful from this perspective.

How could we give a positive role for a bribe-based corruption system? One possibility is that bribery is like an auction mechanism that directs resources to
their best possible use. For example, corruption in procurement is similar to auctioning off the contract to the most efficient entrepreneur who can afford the highest bribe. However, there are some problems with this bribery-based system. First, we care about the means as well as the ends. Bribery is noxious. Allowing bribery will destroy much of the goodwill that supports the system. Second, people should not be punished for their honesty. Indeed, honest government officials can be used to create benchmarks by which to judge the performance of the more opportunistic officials. Third, it is impossible to optimize or even manage underground activities such as bribery.

4.4.5 Government Agency

Another explanation for excessive government is the lack of information available to voters. The imperfect information of voters enables the government to grow larger by increasing the tax burden. From this perspective government growth reflects the abuse of power by greedy bureaucrats. The central question is then how to set incentives that encourage the government to work better and to cost less, subject to the information available.

To illustrate this point, consider a situation in which the cost to the government of supplying a public good can vary. The unit cost is either low, at $c_l$, or is high, at $c_h$. The gross benefit to the public from a level $G$ of public good is given by the function $b(G)$ that is increasing and concave. The net benefit is $b(G) - t$, where $t$ is the tax paid to the government for the public good provision. The chosen quantity of the public good will depend on the unit cost of the government. The benefit to the government of providing the public good is the difference between the tax and the cost. So, when the cost is $c_l$, the benefit is $t_l - c_l G_l$.

When the public is informed about the level of cost of the government, the quantity of public good will be chosen to maximize the net benefit subject to the government breaking even. For cost $c_l$, the public net benefit with the government breaking even is $b(G_l) - c_l G_l$. The public will demand a level of public good such that the marginal benefit is equal to the marginal cost, so $b'(G_l) = c_l$, and will pay the government $t_l = c_l G_l$, for $i = h, l$. This is shown in figure 4.2.

Now assume that the public cannot observe whether the government has cost $c_l$ or $c_h$. The government can then benefit by misrepresenting the cost to the public: for instance, it can exaggerate the cost by adding expenditures that benefit the government but not the public. When the cost is high, the government cannot exaggerate. When the cost is low, the government is better off pretending the cost
is high to get tax \( t_h \) for the amount \( G_h \) of public good instead of getting \( t_f \) for producing \( G_f \). Misrepresenting in this way leads to the benefit of \( G_h[c_h - c_f] \) for the government, which is shown in figure 4.2.

To eliminate this temptation taxpayers must pay an extra amount \( r > 0 \) to the government in excess of its cost when the government pretends to have the low cost. This is called the informational rent. Since the truly high-cost government cannot further inflate its cost, the public pay \( t_h = c_h G_h \) when the government reports a high cost. If the reported cost is low, the taxpayers demand the amount \( G_f \) of public good defined by \( b'(G_f) = c_f \) and pay the government \( t_f = c_f G_f + r \), where \( r \) is exactly the extra revenue the government could have made if it had pretended to have high cost. To give a government with a low cost just enough revenue to offset its temptation to pretend to have higher cost, it is necessary that \( r = [c_h - c_f]G_h \). This is the rent required to induce truthful revelation of the cost and have the provision of the public good equal to that when the public is fully informed.

It is possible for the taxpayers to reduce this excess payment by demanding that the high-cost government supply less than it would with full information. Assume that cost is low with probability \( p_f \) and high with probability \( p_h = 1 - p_f \). By maximizing their expected benefit subject to the government telling the truth, it can be shown that revelation can be obtained at the least cost by demanding an amount \( G_h \) of public services defined by
\textit{b}'(G_h) = c_h + \frac{p_r}{1 - p_r} [c_h - c_r]. \tag{4.10}

This quantity is lower than that with full information. The distortion of the quantity demanded from the high-cost government results from a simple cost–benefit argument. It trades off the benefit of reducing the rent, which is proportional to the cost difference \(c_h - c_r\), and the probability \(p_r\) that the government is of the low-cost type against the cost of imposing the distortion of the quantity on the high-cost government that occurs with probability \(1 - p_r\).

Therefore, if the government is truly low cost, it need not be given the high tax. However, to eliminate the temptation for cost inflation, taxpayers have to provide the government just enough of the rent as a reward for reporting truthfully when its cost of public services is low. Because the ability of the government to misrepresent its costs allows it to earn rents and distort the level of provision, eventually the informational rent makes the government bigger than it should be.

\subsection*{4.4.6 Cost Diffusion}

The last explanation we present for the possibility of excessively large government is the \textit{common resource} problem. The idea is that spending authorities are dispersed while the treasury has the responsibility of collecting enough revenue to balance the overall budget. Each of the spending authorities has its own spending priorities, with little consideration for others’ priorities, that it can be better met by raiding the overall budget. This is the common resource problem, just like that of several oil companies tapping into a common pool underground or fishermen netting in a single lake. In all cases it leads to excess pressure on the common resource. From this perspective a single committee with expenditure authority would have a much better sense of the opportunity cost of public funds, and could better compare the merits of alternative proposals, than the actual dispersed spending authorities. The current trend toward federalism and devolution aggravates this common-pool problem. The reason is essentially that each district can impose projects whose cost is shared by all other districts and so they support higher size projects than they would if they had to cover the full costs. We discuss in more detail the various aspects of federalism in chapter 17.

The problem can also be traced down to the individual level. Consider public services like pensions, health care, and schools and infrastructure work like bridges, roads, and railtracks. It is clear that for these public services, and many
others, the government does not charge the direct users the full marginal cost but subsidizes the activities partly or wholly from tax revenues. There is an obvious equity concern behind this fact. But it is then natural that users who do not bear the full cost will support more public services than they would if they had to cover the full cost. The same argument applies in the opposite direction when contemplating some cut in public spending: contributors who are asked to make concessions are concentrated and possibly organized through a lobby with large per capita benefits from continued provision of specific public services. In contrast, the beneficiaries of downsizing public spending, the taxpayers as a whole, are diffuse with small per capita stakes. This makes it less likely that they can offer organized support for the reform. To sum up, many public services are characterized by the concentration of benefits to a small group of users or recipients and the diffusion of costs to the large group of taxpayers. This results in biases toward continuous demand for more public spending.

4.5 Conclusions

This chapter has provided a number of theories of public sector growth that are designed to explain the data exhibited in chapter 3. Each theory has some points to commend it, but none is entirely persuasive. It is fair to say that all provide a partial insight and have some element of truth. A more general story drawing together the full set of components, including the ratchet effect, income effect, political process, production technology, and bureaucracy would have much in its favor. This would be especially so if combined with the voting models of chapter 10.

The bureaucracy models are particularly attractive because they show how economic analysis can be applied to what appears to be a noneconomic problem. In doing so, they generate an interesting conclusion that casts doubt on the efficiency of government. This illustrates how the method of economic reasoning can be applied to understand the outcome of what is at first sight a noneconomic problem.

The perennial question of whether the government has grown too large is difficult to answer. The reason is that the government is both complementary to the market and a competitor of the market. As a major employer the government competes with businesses looking to hire talented people. The possibility that the best and brightest become public officials and politicians, rather than
entrepreneurs, is considered by many as very costly to society, since they are seen as devoting their talents to taking wealth from others rather than creating it. When people pay taxes, they have less money to spend on other goods and services provided by the market. Likewise, when the government borrows money, it competes with companies looking to raise capital. In some areas like health care and education, public and private services compete with each other. But at the same time the government also serves as useful complement to every business activity by providing basic infrastructure and civil order. Every business depends on the government for things like protection of life and property, a transportation network, civil courts, and a stable currency. Without these things, people couldn’t do business.

Finally, whether an activity is carried out in the public sector or the private sector is itself endogenous. As in architecture, the functions suggest the form. Take the example of education where the goals are multiple (literacy, vocational skills, citizenship, equality of chance, preparation for life) and not precisely measurable and where several stakeholders are involved (parents, employers, students, teachers, taxpayers) with possibly conflicting interests. It is not immediately clear that the market with its single-minded focus can cope adequately with all these aspects, and the risk is that the market could bias the activity toward dimensions that matter more for profit-making.

Further Reading

The concept of the minimal state is explored in:
An account of Wagner’s law can be found in:
Recent empirical tests are reviewed in:
The classic study of public sector growth is:
A nontechnical account on corruption and government is:
The theory of bureaucracy was first developed in:

A fascinating book on bureaucracy from a political scientist is:

The political theory of the size of the government is based on:

The main reference on government agency is:

### Exercises

4.1. Can trade occur in a world with no rules? Is it ever possible to have no rules?

4.2. If it takes four days of labor to produce a week’s food, and one day of labor to steal a week’s food, what will be the equilibrium outcome?

4.3. Would a minimal state finance a fire service?

4.4. Do the data of chapter 3 support the view that governments have expanded beyond the minimal state?

4.5. Discuss whether provision of state education enhances efficiency or equity. What about health care?

4.6. Would a minimal state:
   a. Ensure that wage agreements are enforced?
   b. Limit maximum working hours?
   c. Prevent involuntary overtime?

4.7. Will efficiency be achieved if:
   a. No agent knows what the profit level of a firm will be next year?
   b. One agent does know what the profit level will be?

4.8. Can insider trading occur in the idealized competitive economy?

4.9. All our sulphur emissions are blown into a neighboring country. Can our economy be efficient?

4.10. Are the following policies conducted for efficiency or equity motives:
   a. Provision of unemployment benefits?
   b. Provision of primary education?
   c. Provision of higher education?
d. Provision of retirement pensions?
e. Prohibiting smoking in public places?
f. Imposing higher marginal income tax rates on people with higher incomes?

In the case of efficiency motives, discuss the type of market failure involved.

4.11. Should the government intervene with a redistributive policy if income inequality is due to:
   a. Differences in work effort?
   b. Differences in ability?

4.12. Consider two consumers who each have a total of \( T \) hours to allocate between production and theft. Assume that production produces output \( y_p = \log(t_p) \) for \( t_p \) units of time in production. If time \( t_f \) is devoted to theft, then a proportion \( \frac{t_f}{T} \) of the other consumer’s output can be stolen. Assuming that each unit of output has price \( p \) and both consumers attempt to maximize their wealth, what is the equilibrium? How does the equilibrium depend on the value of \( x \)? What is the equilibrium if there is no theft? What is the maximum that would be paid to prevent theft?

4.13. Describe the expenditures at each stage of the development process in terms of efficiency and equity.

4.14. a. Provide a graphical two-commodity (one private good and one public good) example of a preference relation generating an income elasticity of the demand for public good that is greater than one.
   b. Show that in this case the fraction of the budget spent on public good increases as income increases. Explain also why the indifference curve in this two-commodity space is negatively sloped and convex (preferences are convex if for any two points on the same indifference curve the line segment between them is in the “weakly preferred” set, which is defined as the set of commodity bundles (weakly) preferred to any bundle that lies on the indifference curve.)

4.15. In the same two-commodity economy as in the previous exercise, keeping constant the price of the private good:
   a. Give a graphical illustration of a preference relation generating a price elasticity of demand for public good that is less than one in absolute value.
   b. Show that in this case the fraction of the budget spent on the public good increases as the (relative) price of public good increases.

4.16. Assume that the demand for public output at time \( t \), \( G_t \), is given by the demand function \( G_t = B Y_t^\alpha \), where \( Y_t \) is national income at time \( t \).
   a. What is the income elasticity of demand?
   b. For what values \( \alpha \) of does Wagner’s law hold? Show that expenditure on public output rises as a fraction of income for these values.
   c. Assume that national income growth is determined by \( Y_{t+1} = \beta Y_t + [G - G_t] \). Will an increase in \( G_t \) raise \( Y_t \) in the cases where Wagner’s law applies? Explain the answer.
4.17. Obtain data on public sector expenditure as a proportion of gross domestic product since 1970. Is expenditure still growing? Assess the answer relative to the arguments of the development model. Do the data describe a relation of demand to income that supports Wagner’s law?

4.18. Sketch a story of learning about preferences that supports the ratchet effect.

4.19. Assume that the rental rate for capital is fixed at \( r \). If the private sector has a production function \( y = K^{1/2} (tL)^{1/2} \) and sells output at price \( p \), what happens to the wage rate as technical progress increases \( t \)? What would happen if \( r \) were not fixed? Relate your answer to Baumol’s law.

4.20. Suppose that the production function is \( y = \log(K) + \log(tL) \). If demand is constant and labor productivity doubles, what happens to labor demand? What will happen to the wage rate if the economy has many firms in this position? Does this analysis support Baumol’s law?

4.21. Consider a simplified setting for Baumol’s law where there is no capital. Let the private sector have the production technology \( y^p = tL \), where \( L \) is labor input and \( t \) denotes exogenous technical progress that occurs as time passes.
   a. With output price \( p \), use the condition of zero profit at the competitive equilibrium to determine the wage rate.
   b. Calculate the cost function for the firm.
   c. Let the public sector have production function \( y^g = L \). Show that the ratio of marginal costs in the two sectors grows at rate \( t \).
   d. Find the equilibrium path for the economy if it has a single consumer, with preferences given by \( U = \log(y^p) + \log(y^g) \), who can supply one unit of labor in each time period. Comment on the relative size of the public sector.

4.22. Describe the benefits a bureaucrat can obtain from an increase in bureau size. Are there any private costs?

4.23. Do regular changes in government assist or hinder bureaucrats in expanding their bureaus?

4.24. Why might it be better to tolerate bureaus of excessive size rather than permit bureaucrats to seek rewards in cash?

4.25. a. In the model of bureaucracy, let \( B(y) = y^{1/2} \) and \( C(y) = y^2 \). Calculate the value \( y^* \) that maximizes \( B(y) - C(y) \). For what values of \( y \) does \( B(y) = C(y) \)? Use this to find \( y^b \). Show that \( y^b > y^* \).
   b. Now let the bureaucrat’s income be given by \( M = a + by \), and let his utility be given by \( U = B(y) + M \). Does this alter the chosen value of \( y^b \)?
   c. Is there any pay scale relating \( y \) to \( M \) that can lead the bureaucrat to choose \( y^* \)?

4.26. How can right-wing and left-wing governments be modeled using the budget-setting framework?

4.27. Consider a profession with \( n \) members and revenue determined by \( r = bn - \frac{1}{2}n^2 \). What value of \( n \) maximizes total revenue? What value maximizes revenue per member
of the profession? If the benefit from the profession is $vn$, what is the efficient membership? Contrast these three membership levels.

4.28. a. For the inverse demand function $p = a - by$ and cost function $C(y) = cy$, contrast the output choices of a profit-maximizing monopolist, an output-maximizing monopolist and a revenue-maximizing monopolist. Which is the best description of the public sector?

b. Now let the number of members in a profession be $n$. Given a fixed price $p$ for output and a cost function $C(y)$, calculate the values of $y$ and $n$ that maximize per capita profit. What are the efficient values of $y$ and $n$?

4.29. Consider an economy with two goods (consumption and labor) in which individuals differ only in their income-generating ability $a_i$. Suppose that the distribution of abilities in the population is such that the median ability level, $a_m$, is strictly less than the average ability level, $a$. Suppose that the income level of each individual $i$ is $y_i = \left(1 - \frac{t}{C_0}\right)a_i$, where $t > 0$ is the proportional income tax rate. Suppose also that all tax revenues are redistributed through a uniform lump-sum grant $g$.

a. What is the tax rate which maximizes the lump-sum grant?

b. Using the fact that individual $i$’s after-tax income is equal to $g + \left(1 - \frac{t}{C_0}\right)y_i$, show that income equality requires $t = 1$ and that the poorest ($a_i = 0$ and so $y_i = 0$) can be better off with a lower tax rate (and thus more inequality).

c. If every individual $i$’s preference over $(t, g)$ is $v_i = g + \frac{1}{2} \left(1 - \frac{t}{C_0}\right)^2a_i$, then what will be the tax rate chosen by majority voting? (Hint: The median ability individual is the decisive voter in this model.)

d. Show that the majority voting tax rate is increasing with the difference between the average and the median ability levels, $a - a_m > 0$. Does that mean that increasing inequality raises the relative size of the public sector (as measured by the tax rate)?