Chapter 1

Introduction

The composition of government expenditure varies considerably across countries. For instance, on average the share of expenditure on transfer payments in democratic countries is higher than in non-democratic countries, although non-democratic countries have higher income inequality than democratic countries. In contrast, the share of expenditure on public goods in democratic countries is lower than in non-democratic countries. The average share of total expenditure on education and health in these two groups of countries is similar. However, the variation across non-democratic countries is considerably higher than among democratic countries.

There are substantial variations even among developed democratic countries in their tax and expenditure policies, although these countries share similar economic and political regimes. For example, the US has relatively high income inequality and combines a low overall tax rate with a low ratio of expenditure on transfer payments to that on public goods. Scandinavian countries typically combine low inequality with high tax rates and substantially higher expenditure on transfer payments relative to public goods. British Commonwealth countries (Australia, Canada, UK and New Zealand) have higher income inequality than Scandinavian countries (Denmark, Finland, Norway and Sweden) and yet devote much less to transfer payments compared with public goods.
These variations naturally raise the question of what determines the composition of government expenditure. The aim of the present book is to explore this question using a range of modelling approaches. It investigates the extent to which the composition is influenced by, for example, the nature of individuals’ preferences for private and public goods and the degree of heterogeneity in the population. The modelling approaches allow for different economic environments, involving the types of expenditure considered, the time period of analysis (whether single or multi-period) and the behaviour of individuals.

In addition, different decision mechanisms are investigated. Broadly, the composition of expenditure is examined using political economy and public finance frameworks. The former ‘positive’ approach examines government expenditure under voting. The main emphasis is on majority voting by selfish individuals, though alternatives are briefly examined (for example, where voters have some regard for inequality, or where ‘probabilistic voting’ applies and voting behaviour reflects a political bias). The second ‘normative’ approach examines the composition of government expenditure if the choice is made by a single disinterested individual (one who is not a member of the population concerned) whose value judgements are summarised by an evaluation, or social welfare function expressed in terms of individuals’ utilities. Hence the judge or decision maker is considered to be a utilitarian, with an individualistic ‘welfarist’ evaluation function involving a trade-off between equity and efficiency.

Attention is necessarily restricted to quite small, and even simple, models in terms of the heterogeneity and the kind of economic structure imposed. Even with such models, it is seen that the analysis rapidly involves complexities which would otherwise become intractable. This kind of problem is of course familiar from well-known models which concentrate on the determinants of the size, rather than the composition, of government expenditure. Similarly, much of the focus is on the allocation of tax revenue between just
two components of government expenditure: these are referred to in terms of a transfer payment and a public good. In the majority voting framework this avoids severe problems of multidimensional voting. However, in some cases, expenditure on public education is also examined: this has interesting implications in view of the effects on each individual’s productivity.

The emphasis here is thus on attempting to understand possible explanations of differences in expenditure patterns by exploring alternative modelling approaches. However, empirical analyses are also carried out whereby potential orders of magnitude of various components of the models are obtained. The empirical analyses may therefore be described as illustrative of the models and approaches. Thus, no claim is made that the models are properly subject to empirical econometric tests, and of course the models are in many ways too simple to capture all the complexities of reality: nevertheless it is argued here that they can help in considering important factors and inter-relationships involved.

The models can also help to shed some light on earlier empirical results which have been obtained using reduced-form specifications which have not considered the structure of models in any detail. Indeed, in the case of the normative approaches any kind of empirical testing would not be meaningful. But it is possible to consider what kind of value judgements appear to be consistent with observed expenditure patterns. Ideally, it would be useful to have time series data about a range of countries, but such data are simply not available. Furthermore, it is likely that there would be insufficient variation over time in important variables. Attention is therefore restricted to cross-country comparisons, though here there are important data limitations associated with the measurement of expenditure components and wage rates, which are discussed in detail.

Within both the political economy and public finance approaches, relatively few studies have concentrated on the composition of expenditure. The vast majority of the literature has instead given more attention to the total
government size or the tax rate. Typically in the models a single type of government expenditure, usually a transfer payment, is financed by income taxation. The choice of government expenditure level in these models is determined, via the government budget constraint, by the tax rate. It is well known that explicit solutions (both for voting and optimal tax models) can be obtained only if strong assumptions are made, for example about individuals’ preferences and the extent of population heterogeneity. However, a major result which arises from the majority voting models in this literature is that a lower median income relative to mean income increases the demand for redistributive expenditure. Similarly, in the optimal tax literature, a higher degree of basic inequality (of individuals’ ability levels and hence wage rates) gives rise to a higher tax rate and thus more redistribution.

However, empirical cross-sectional studies have not unambiguously confirmed this result. Lind (2005) summarises empirical studies concerning this relationship, based on cross-sectional data for a range of countries, and finds mixed results. There are of course many complicating factors and differences among countries which are not included in the simple models. These complications include the existence of multiple social contracts, the prospects of relative income mobility, multidimensional policies, race and the question of redistribution versus social insurance: they are surveyed by Harms and Zink (2003) and Borck (2007). Furthermore, Tridimas and Winer (2005) emphasise the role of political influence and thus the ‘supply side’ of government.

There are, in addition, dynamic issues and adjustment lags which are not modelled in cross-sectional analyses. For example, changes in policy may respond to changes in inequality with a significant lag. According to Persson and Tabellini (2000, p. 123), in most countries ‘transfers rose most quickly during the 1960s and 1970s, when income inequality was generally on the decline; during the 1980s and 1990s, in contrast, inequality instead turned upward, whereas redistributive transfers rose less quickly’. Such dynamic aspects are not modelled here.
Since the emphasis of the present study is on the composition of expenditure, rather than its total, the income tax rate is instead assumed to be exogenously fixed: it is not a decision variable. The tax rate is assumed to be determined by a separate process. It may be thought of as determined by some conventional view regarding taxable capacity, or other constraints are imposed on governments regarding the rate. Bearse et al. (2001) also assume that the tax rate is given exogenously, when examining majority voting over a uniform transfer and public education. A similar assumption is also made by Tridimas (2001, p. 308) and Tridimas and Winer (2005), who consider voting over tax-financed public goods. Tridimas (2001, p. 308) suggested that this assumption ‘is less restrictive than it first appears, since in practice governments are often constrained in the policy instruments that they may vary at any one time’. In practice, tax and expenditure policies are usually debated separately and stronger constraints are usually imposed on changes in income tax rates. Allowing the tax rate to be endogenous would raise considerable difficulties both with multidimensional voting, as discussed by, for example, Mueller (2003, pp. 87-92), and maximisation of social welfare functions. It is also possible to envisage the decision problem considered here as a second stage in a two-stage process, where the first stage concerns only the tax rate, and the second stage concerns the composition of expenditure conditional on a given tax rate.1

A strong result of the present study is that the various models examined here, using different structures and different decision mechanisms, give rise to a general result regarding basic inequality and redistribution, which may be compared with the result of the earlier literature concerned with the choice of government size. It is found that a more redistributive structure – in terms of a higher proportion of expenditure being devoted to transfer payments – is associated with a higher degree of wage rate inequality. Importantly,

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1On such two-stage voting in a public choice context, see McCaleb (1985), who emphasises uncertainties involved during the first stage.
inequality can in all cases be defined in terms of the proportional difference between a particular measure of location of the wage rate distribution, and the arithmetic mean wage. In positive majority voting models the measure of location is the median wage. In normative optimal expenditure models, where a social welfare function is maximised, the location measure turns out to be a type of welfare-weighted mean wage. The welfare weights depend on the degree of inequality aversion of the judge or decision maker. In general the optimal expenditure allocation, expressed in terms of such an inequality measure, does not provide a closed-form solution. However, an approximation is proposed which allows the general property to be transparent.

However, numerical illustrations show that the relationship between (appropriately defined) inequality and the ratio of transfer payments to public goods expenditure is relatively flat over the relevant range of inequality. This may shed some light on why empirical studies have found mixed results concerning inequality and redistribution.

1.1 Outline of the Book

The remaining chapter in Part I of this book is also introductory in nature. Chapter 2 provides an initial exploration of the basic issues which arise when attempting to model the composition of government expenditure in a simple static model, where there are just two components of expenditure. First, it considers the division between a transfer payment and a pure public good. Second, the division between a transfer payment and tax-financed education is examined. The choice of the composition of government expenditure is modelled for three decision mechanisms. These mechanisms are majority voting, stochastic voting and a decision maker who maximises a social welfare function. In order to focus attention on alternative choice mechanisms, incomes are assumed to be fixed. Individuals differ only in their ability, and hence wage, levels. There is no heterogeneity in tastes.
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Special attention is given to the relationship between the composition of expenditure and inequality. It is shown that inequality can be regarded as the proportional difference between the arithmetic mean income and another ‘measure of location’ of incomes: the precise location measure depends on the particular choice mechanism investigated. Using the majority voting result, the weight attached to the public good in utility functions is calculated for a sample of democratic countries, suggesting that different preferences for public goods resulting from cultural differences may be an important determinant in shaping the composition of government expenditure.

Part II of this book is devoted to analyses of voting models of government expenditure. Incentive effects are the key aspects when looking at transfer payments and the composition of government expenditure given the tax rate. Chapter 3 extends the fixed income analysis of Chapter 2 and studies majority voting over the division between expenditure on public goods and on transfer payments. A static model is constructed in which individuals have different abilities but similar preferences for consumption, leisure and public goods. Majority voting is made conditional on the tax rate in a proportional income tax structure. The voting equilibrium is studied within three environments. First, a baseline approach is considered where self-interested individuals vote on public goods. Individuals derive utility from private consumption, public goods and leisure. Then, in order to study the effect of altruism on majority choice, the baseline model is extended by allowing voters to care not only about their own consumption but also about inequality.

The model is then extended in Chapter 4 to consider how home production affects voting outcomes regarding the composition of government expenditure. Despite the importance of home production in some contexts, it is found that within the models examined, it has relatively little effect on the choice of the expenditure composition. For this reason, home production is neglected in the remainder of this book.

Chapter 5 turns to a dynamic model, in an attempt to deal with some
of the limitations of a static environment. For instance, a static model does not allow forward-looking decisions, such as investment, and the way they interact with policy choices to be examined. For example, increasing the level of expenditure on redistribution, for a given tax rate, affects investment in physical or human capital. In addition, if capital accumulation is added to the model, increasing the transfer payment reduces the incentive for saving and raises the interest rate and decreases the real wage. These effects cannot be studied in a static environment.\(^2\)

Chapter 5 examines the majority voting result for the division of government expenditure between public goods and redistribution in a partial equilibrium dynamic environment. This choice is considered in the context of an overlapping generations model in which a pure public good and a transfer payment, in the form of a pension, are tax-financed on a pay-as-you-go (PAYG) basis. The decision clearly involves much more than simply the redistribution of income among members of the same cohort. The unconditional pension requires a decision regarding income shifting between periods within the life cycle as well as intra- and inter-generational redistribution. Young individuals in the first period of their life pay tax to finance expenditure on public goods and pensions. Therefore there is ‘social contract’ across generation. The PAYG scheme must make the majority of each cohort better off than the private saving alone. Individuals support a public saving or a PAYG scheme as long as they receive higher welfare. The condition for support of social contract is obtained and it is shown to be an extension to the famous Aaron (1966) and Samuelson (1958) result. The decision mechanism involves majority voting by members of each cohort regarding desired pension and public goods expenditure during the retirement period, on the understanding that during the working period each cohort finances the expenditure previously agreed by the preceding cohort and voters are

\(^2\)The focus clearly differs from the large literature concerned with the effects on growth of different types of government expenditure; see the survey by Irmen and Kuehnel (2009).
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aware of the nature of the government budget constraint. In order to attempt to understand the way in which preferences and economic conditions may combine to influence the composition of expenditure, this chapter uses analytical results to produce an implied weight attached to public goods for each country.

Part III turns to the consideration of government expenditure in an optimal choice context. Chapter 6 uses the same framework as Chapter 3, but instead of examining the majority voting outcome, the choice of a social planner who maximises a social welfare function is considered. The social welfare function represents the value judgement of the social planner, and reflects an explicit trade-off between equity and efficiency.

In Chapter 7, the approach is extended to the more complex case of three components of government expenditure, by adding public education expenditure to the model. This is not considered in a voting framework because of the familiar problems with multidimensional voting. Despite the extra complexity arising from education expenditure by the government, where wage rates as well as labour supplies are endogenous, explicit solutions are obtained for expenditure shares.

Chapter 8 returns to the basic dynamic overlapping generations model of Chapter 5, to consider the maximisation of a welfare function defined over multiple generations.

Part IV turns to general equilibrium modelling. Chapter 9 examines the division of government expenditure between a pension and public goods in the context of a dynamic general equilibrium model with overlapping generation of heterogeneous individuals. In this chapter, a majority voting mechanism is considered in which individuals vote on the share of redistributive expenditure in the next period, for a given tax rate. The basic context is thus similar to that considered in Chapters 5 and 8. However, the rate of interest and wage rates are endogenous, as a result of the explicit modelling of the production function. The general equilibrium environment allows consider-
ation of the relationship between endogenous policy variables and capital accumulation and total output.