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Positive and Normative Analysis when Collective Choice Matters

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## The Political Economy of Taxation: Positive and Normative Analysis when Collective Choice Matters

by

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### **Abstract**

In this paper we review both positive and normative aspects of taxation. We examine how to study why taxes and revenue structures have taken their present form and why they are used in a particular way as part of the democratic process. In addition, we also consider the classic normative questions, namely what makes a good tax system and how to assess the efficiency of taxation. In dealing with both aspects of the tax literature, we attempt to set out a plan for a more complete and comprehensive analysis of taxation in the face of collective choice than is attempted in most of the available literature on fiscal issues.

Key words: taxation, revenue structure, collective choice, democratic process, optimal tax.

JEL classification: D70, H10, H11, H20, H21

## 1. Introduction

There are many reasons for studying taxation. As the ancient Roman writer Cicero pointed out so succinctly, when he called it the sinews of the state, taxation is central to the existence and functioning of a nation, as well as to the functioning of its lower levels of government. Taxing citizens is a vital method of financing the most essential public sector activities, such as the courts, the legal system, national defense and police protection. In addition, it provides the means for producing social programs, such as public health services, education and welfare. Finally, taxation is one of the most important ways in which a community's distributional goals may be attained.

The study of collective choice is an essential part of any comprehensive analysis of taxation. The activities of communities differ in nature from activities carried out by the private sector. Provision of most publicly provided goods or services cannot be accomplished and organized through markets. Instead, collective choice procedures are needed to allocate required resources and to decide the level and extent of public provision. In democratic countries, governmental expenditures, and the ways of raising the necessary revenues, are usually determined by some type of majority rule, although such rule may be limited or attenuated by constitutional provisions and constrained by the operation of a competitive system of political parties. Taxation thus represents an essential tool for decision makers who want to command scarce resources for use in the public sector as part of the democratic process.

In this paper we review both positive and normative aspects of taxation. We examine how to study why taxes and revenue structures have taken their present form and why they are used in a particular way as part of the democratic process. In addition, we also consider the classic normative questions, namely what makes a good tax system and how to assess the efficiency of taxation. In dealing with both aspects of the tax literature, we attempt to set out a plan for a more complete and comprehensive analysis of taxation in the face of collective choice than is attempted in most of the available literature on fiscal issues.

Since our emphasis is on the positive and normative study of tax structure and tax systems, we pay only limited attention to the political economy of redistribution. Some branches of the fiscal literature make the link between progressive taxation and redistribution their main focus, while trying to analyze how income tax rates are determined as part of the political struggle over a society's income shares. While we shall consider studies of this nature, we conceive of fiscal analysis as an enterprise of broader scope than is implied by the approach adopted in this work. In our view, questions of efficiency as well as of redistribution are involved in studying political equilibria, and fiscal policy encompasses the use of many different kinds of taxation as well as of other policy instruments such as regulation that affect the drawing of resources into the public sector.

Although most dictatorial regimes also make use of taxation, we deal primarily with fiscal choices in democratic states in this essay. The reader with a special interest in the analysis of authoritarian regimes may want to consult the recent work by Wintrobe (1996), where a theory of such states is developed. Comparative international analysis relevant to this topic can be found in Musgrave (1966) and Kenny and Winer (2001), where tax systems in a large sample of countries are examined in an econometric framework.

In view of space constraints, references to the literature will be illustrative rather than exhaustive. The essay emphasizes theoretical ideas and empirical issues relevant to the study of tax systems and tax structure. Further bibliographic material can be found in Hettich and Winer (1999); in Boadway and Keen (2000) concerning the political economy of redistribution; in Gould and Baker (2002) and

Kirchgaessner (2002) with respect to taxation and political institutions; and in Webber and Wildavsky (1986) concerning fiscal history.<sup>1</sup>

## 2. Basic Issues

### 2.1 *Two major approaches*

There are two broad approaches to the study of taxation, both with an extensive and well-developed literature. The first one is associated with the work of Wickseil (1896) and Lindahl (1919), two of its most important early proponents, as well as with work of Buchanan (e.g., 1968, 1976). Here, taxation is seen as part of an exchange - albeit an imperfect one - between citizens and their government. Tax payments are made to obtain public goods and services, and to some extent, to participate in collectively determined redistribution. The emphasis is on taxation as a price for public output consumed by voters, and on institutions or methods designed to link the fiscal and the expenditure sides of the budget.

A second approach sees taxation as a set of policies that are linked only indirectly to the expenditure side via the government budget restraint. Taxation is analyzed as the coercive taking of resources to finance largely unspecified government activities. The emphasis is on ways to minimize the efficiency costs of taxation through the policy choices of a social planner. Such a planner may also take account of distributional aims in achieving his or her objectives, by including distributional weights in the design of fiscal policy. Such weights will be derived from an exogenously given welfare function, rather than being the outcome of a political process. The second approach has its origins in the work of Edgeworth (1925), Ramsay (1927) and Pigou (1952) and has been developed with great analytical sophistication by Mirrlees (1971) and others in the recent literature on optimal taxation.<sup>2</sup>

Although the two approaches to taxation are quite distinct in emphasis and in the results that they reach, both must contend with the same central problem, namely the separation of taxing and spending. Governments provide goods and services that are different in nature from those provided through private markets. So-called public goods, such as defense, are consumed equally by all members of the collectivity, and it is not possible to ration such goods according to price, as is done in markets for private goods. The same is true for goods that are mixed in nature, having both public and private characteristics. The difficulty of excluding those who do not pay voluntarily from enjoying the benefits of public output gives rise to the problems of preference revelation and free-riding. In response, most collectivities use coercive taxation to finance public output, creating tax systems where there is only a diffuse and distant link between additional consumption of publicly provided goods and increases in tax liability.

The separation of taxing and spending gives rise to welfare losses over and above the losses due to the tax payment itself, a primary focus of the tax literature.<sup>3</sup> Individual taxpayers will respond to tax

<sup>1</sup> There are also several excellent studies of the political and economic aspects of specific taxes or episodes in tax history of particular countries. This literature notably includes Witte (1995) on the income tax system of the United States and Gillespie (1991) on the tax structure of Canada. ➡

<sup>2</sup> For a review of Optimal Taxation, see for example Stiglitz (1987).

<sup>3</sup> See Creedy (1998) for extended discussion of the meaning and measurement of excess burden.

rates by adjusting their activities so as to reduce their tax liability, with such adjustments being quite unrelated to the consumption of publicly provided goods. If an income tax is levied, for example, taxpayers may reduce work effort and consume more leisure, in order to maximize utility in the face of such taxation. This results in a reduction of economic welfare in comparison to a situation where payment for the same public output elicits no such trade-off or evasive adjustment. The size of this loss - the excess burden or deadweight cost of taxation - is used in the literature as a measure of the inefficiency created by a particular tax. The same type of analysis can also be used to compare the efficiency (or inefficiency) of different available tax instruments.

Separation of taxing and spending also has implications for redistribution. Since markets cannot be used to allocate public goods and their costs among users, and to determine what level of such goods should be produced, other mechanisms must be employed to reach such decisions.<sup>4</sup> All available collective decision processes create their own incentives for redistribution between those in the majority and those in the minority with regard to a particular fiscal issue. In addition, the separation of the two sides of the budget makes it more difficult to understand the distributional implications of various ways of providing and financing of public programs. This opaqueness may be exploited by those who are in a position to use public resources for their own purposes.<sup>5</sup>

Although both basic approaches to taxation must confront the separation of taxing and spending, they deal with its implications in quite different ways. The first approach focuses on collective decision processes and fiscal structures designed to create a closer link between taxing and spending, or on institutional and fiscal constraints that would have the effect of limiting coercion. Wicksell was the first to suggest ways to reduce coercion, and thus separation, by proposing unanimity, or qualified unanimity, as a budgetary decision criterion. Increases in budgets, as well as the ways of financing them, could only be adopted if they passed according to this criterion. Lindahl further formalized the analysis by providing a theoretical process where tax shares and the output of public goods were jointly decided in bargaining among the affected decision makers.<sup>6</sup>

The second basic approach adopts a rather different perspective. Decision processes are taken as exogenous, and their effects are not examined as part of the analysis. This is exemplified by the assumption of a social planner who makes decisions on behalf of the collectivity according to an exogenously given welfare function. In this literature, the emphasis is shifted to the identification and measurement of welfare losses, and to the design of tax systems that maximize social welfare, given the assumed analytical framework.

## *2.2 A comprehensive approach with collective choice*

In describing the two approaches, we have emphasized what may be called normative questions. Tax analysis has an additional dimension, however. Although it is interesting to ask how efficiency in taxation should be defined, and how it can be measured, it is of equal importance to examine the nature of existing fiscal systems. In this context, we ask why tax systems have the characteristics that

**This problem has given rise to several normative approaches to the distribution of the tax burden as alternatives to taxation according to benefits received, including most notably the principle of taxation according to ability to pay. See for example Musgrave (1959, chapter 5).**

<sup>5</sup> Wagner (1976), Buchanan and Wagner (1977), West and Winer (1980) and others have considered the role of fiscal illusion in the political manipulation of taxation and public debt.

<sup>6</sup> On the concept of a Lindahl equilibrium, see also Foley (1970), Johansen (1965) and Head (1974)

we observe and what may explain the variations in revenue systems among different jurisdictions. This type of examination is usually called positive analysis.

The study of actual revenue systems reveals that there is a similar underlying structure despite of the many variations that are observed (Hettich and Winer 1999). Taxes are imposed on several major bases, such as personal income, corporate profits or property. Each tax has a rate structure, which may be simple or more complex. In addition, there are special provisions that affect the definition of the base and that may specify separate rates for particular components of the base, such as capital gains. In practice, tax policy is a manipulation of some aspect, or a combination of characteristics, of this *tax skeleton*. If we follow the methodological approach that underlies all economic theory, we can interpret observed tax systems as equilibrium outcomes of economic and political processes and forces.

A comprehensive or complete approach to taxation will include both positive and normative analysis. It will allow us to analyze observed tax systems, as well as guide us in asking questions about possible improvements in the many existing features of such systems. To achieve this, we need models that encompass theoretical analysis of both positive and normative questions and that allow statistical testing of hypotheses derived from them (Hettich 2002).

If we briefly return to consider the two approaches to taxation reviewed earlier, we see that only the first one provides a suitable starting point for the development of a comprehensive analysis. Observed tax systems arise from decisions made through collective choice processes. To explain them, we must start by modeling such processes and by linking actual revenue systems to the predictions of our models. The assumption of a social planner does not provide a starting point for meaningful theoretical or empirical research of this nature. Although we can derive a sophisticated normative analysis with the planner framework, we cannot fully link it to the results of positive analysis as required by a comprehensive approach.<sup>7</sup>

Creation of an inclusive fiscal policy analysis is not an easy task. Although the literature contains many of the necessary elements, they have not been assembled as yet into a fully integrated theoretical system. Figure 1 gives a schematic presentation of the different elements in a complete analysis and shows their interrelation. As in traditional microeconomics, we start with the behavioral assumptions of essential decision makers. In democratic countries, decision makers include voters, who have additional roles as taxpayers and consumers of public goods, and who also participate in the private economy. In most models, they are assumed to maximize their utility. We also have politicians who propose policies or platforms and whose goal it is to be elected. The interactions of voters and politicians takes place in a given constitutional framework (written or unwritten), a postulate that parallels the assumption of a set of existing property rights in the study of private markets.

(Figure 1 here)

To be useful, any proposed model must yield stable equilibria and must be accompanied by

**In addition to bypassing the essential role of collective choice, a social planning approach imputes motives to public decision makers that differ from those of their self-interested private counterparts included in the same framework. Brennan and Buchanan (1980), Kau and Rubin (1981), Levi (1988), Wilson (1989), Edwards and Keen (1996) and others have drawn attention to the importance of motivation by public officials in the analysis of taxation.**

proofs of their existence. Otherwise, it is not possible to carry out comparative static analysis of the kind common in economics. The model should yield predictions or hypotheses useful for positive analysis, whether based on partial equilibrium analysis or on a more general framework, so that they can be tested with accepted statistical techniques. A comprehensive approach can also be used for computational general equilibrium analysis that includes an explicit voting mechanism in the modeling of the public sector. This will allow investigation of how exogenous shocks or changes in policy affect the economic welfare of different voting groups, and how these changes in welfare feed back to determine the choice of tax and other policy instruments via the collective choice mechanism represented in the model.

It is desirable that the same framework can also be used for normative analysis. This requires that, under specified conditions, political equilibria satisfy certain characteristics, such as Pareto Optimality. If this demonstration can be accomplished, the framework can also be used for work described in the boxes on the right-hand side in Figure 1. One should note the similarity between the proposed scheme and the approach common in economics applied to the private sector, where positive and normative analysis are both based on the same model of competitive markets, where the First Theorem of Welfare economics (the 'invisible hand' theorem) links positive and normative analysis, and where the study of market failure is used as an aid to restore the operation of decentralized market forces. However, any examination of optimality must now refer to *political* markets, not to their private counterpart. The same is true when we turn to the study of deviations from optimality. We now deal with political market failure, rather than with the malfunction of private markets.

### **3. Political Equilibria and the Partial and General Equilibrium Study of Tax Systems**

A comprehensive approach to the political economy of taxation begins with positive theory, represented schematically by the left side of Figure 1. In proceeding down the left side of the figure, we confine the discussion by and large to two frameworks that have been most widely used for positive theoretical and empirical work. These are the median voter and probabilistic voting models. Subsequently, we will turn to the use of these models in normative theorizing. While it will become apparent that neither of them is entirely satisfactory from the perspective presented here, there is much that has been learned about the political economy of taxation from exploration of these approaches.

We begin the discussion of each model with a brief description of its constitutional structure and key behavioral assumptions, and then turn to the question of the existence of equilibrium. We shall see that the manner in which this question is dealt with has a determining influence on the development of the theory.

#### **3.1 *The median voter model and its extensions***

One of the first models of the public sector to explicitly incorporate a collective choice mechanism was based on the median voter theorem of Duncan Black (1958). This is a model of direct democracy where alternatives to the status quo may be proposed without cost, and in which the institutions of representative democracy do not play an explicit role. Behavioural assumptions for individuals are straightforward: citizens vote sincerely for the policy platform that maximizes their welfare, given the structure of the private economy, and there is no uncertainty about how any voter will behave at the polls.

The model focuses on the problem of coercion made possible by the use of majority rule and aggravated by the separation of spending and taxing.<sup>8</sup> It is successful in explaining coercive redistribution, despite the tendency for redistributive voting games to lack equilibria (see McKelvey 1976 and Schofield 1978), because the analysis is carried out in a carefully limited framework. With some exceptions, mentioned below, application of the median voter theorem to describe a political equilibrium requires that the fiscal system be reducible to one independent parameter over which (indirect) preferences are single-peaked. Even if preferences are well-behaved in more than one dimension, endless cycling over alternative proposals rather than an equilibrium tends to occur, and the model is then of little help in understanding observed tax policy, which exhibits considerable stability over time and place.

A standard model involves a single rate of tax (usually in a linear progressive system) that is chosen by majority rule, and a uniform subsidy or one pure public good on which all revenue is expended. Voting over the average tax rate, or equivalently over the size of the subsidy provided, continues until one rate emerges - the Condorcet winner - that cannot be defeated by any other proposal in a pair-wise majority vote. This tax rate and the implied subsidy level maximize the welfare of the median voter - the voter whose preferred tax rate is at the median of those most desired by each voter (see for example, Romer 1975 and Meltzer and Richard 1981). If the median voter's income is below the average, the median voter demands and receives a positive tax rate and corresponding subsidy.

The extent of redistribution toward the median voter and the corresponding size of government are limited by behavioural responses to taxation. In the linear income tax case, the equilibrium tax rate, and thus the degree of average tax progressivity, depends on the elasticity of labour supply. As this elasticity increases, more substitution from work to leisure occurs at any rate of tax. This in turn causes a reduction in the aggregate size of the tax base and in the fiscal surplus (the difference between benefits received and the full cost including excess burden of the taxes paid) that can be enjoyed by the median voter. In equilibrium, the tax rate demanded by the decisive voter therefore declines.<sup>9</sup>

Extension of the median voter model to a non-linear income tax system is possible, such as when a second parameter that controls the degree of marginal rate progressivity is added to the average rate of tax. In this case, establishing existence of an equilibrium requires either that further restrictions be placed

**Even if there are no public goods, the use of majority rule allows coercion to exist. Separation of spending and taxing, which is necessarily present when public goods are provided, opens up additional routes by which coercion may be exercised.**

<sup>9</sup> **One longstanding and as yet unanswered question that may be raised at this point is why the extension of the franchise in the nineteenth century to those with lower incomes did not lead to the expropriation of capital through the fiscal system. A possible answer provided by the median voter, as well as by the alternative framework considered later, lies in the negative implications for wealth and income of high taxes on the rich, although this remains a conjecture. On this point, see for example Winer and Rutherford (1992), who explore the argument in a computable equilibrium model calibrated to the U.K. economy in the 19th century. Brosio and Marchese (1992) suggest that the answer may lie in understanding how and why the franchise was extended in the first place.**

**Roemer (2001) constructs an interesting model where equilibrium is established because of the need by every political party to construct a coalition of members with various interests, all of whom prefer its policies to that of the opposition. The difficulty of maintaining this coalition severely constrains the ability of political entrepreneurs to engineer a winning coalition, regardless of what the opposition proposes. This may be considered as an alternative general way of modeling political equilibrium. In such a framework, redistribution can be limited by a party's need to appeal to particular groups of voters - such as the poor and also religious voters, some of whom may be rich.**

on the nature of voter preferences (see Roberts 1977, Meltzer and Richard 1981, and Gans and Smart 1996), or it must be assumed that each fiscal parameter is decided by majority rule in a separate 'committee' of a legislature or in a separate election in which the median voter is decisive (as in Meltzer and Richard 1985).<sup>10,11</sup> Then, in addition to the skewness of income as indicated by mean relative to median income, the variance of income also affects the equilibrium size of government. With a higher variance, incomes at the high end of the income scale are even bigger, and this can lead to even more redistribution being demanded by the median voter whose income is below the average (Cukierman and Meltzer, 1991).

A further application of the median voter model allows for private supplementation of publicly provided private goods, such as with health care (Gouvia 1997, Epple and Romano 1996a,b). When equilibria in the model extended in this way can be established - a difficult issue in this more complex policy setting - an intriguing 'ends against the middle' result can be established. It may be that middle income earners who favor a large public sector are opposed by the poor who want lower taxes because they do not value the publicly supplied good highly relative to private consumption, and by the rich who want lower taxes so they can finance even higher levels of the publically supplied private good than will ever be forthcoming from the public sector. In the equilibrium, the middle income group may win out at the expense of both the poor and the rich.<sup>12</sup>

Before turning to the probabilistic voting framework, one may note that the splitting of dimensions that has sometimes been used to justify extension of the median voter model to multi-dimensional fiscal systems is an alternative way of establishing a political equilibrium (Shepsle 1979, Shepsle and Weingast 1981). Those who adopt this approach relate particular legislative rules and procedures, or norms of behaviour, (called the 'structure') to the nature and stability of policy outcomes in institutional settings where a vote cycle would otherwise occur.

The approach usually takes one beyond the median voter framework, where a single decisive voter gets what he or she wants. A norm of behaviour among politicians on a specific committee of a legislature, for example, may survive because members receive a return to co-operating, inducing them not to vote according to their narrow self-interest. They will do this because they recognize that voting according to broader criteria will eliminate the uncertainty that would result from cycling over alternatives.

A major challenge in using the structure-induced framework lies in identifying the specific institutional arrangements that result in a particular feature of the observed tax skeleton. This difficulty limits the application of the approach to taxation, including applications to non-linear tax systems. An exception is the work of Inman and Fitts (1990), who use the approach to focus on universalism and reciprocity ('you

**The restriction on preferences is related to the Mirrlees-Spence single crossing property, so that incomes and abilities of all voters are monotonically related. The application of this kind of restriction to allow another dimension of policy in the median voter model are reviewed in Boadway and Keen (2000). It appears that such restrictions cannot be used to allow a median or decisive voter model to extend to the analysis of the tax skeleton as a whole.**

<sup>10</sup> It should be noted that when we assume that decisions on different tax parameters are made sequentially in different election or committees, each policy parameter must have an independent relationship to welfare in the minds of those involved. Such a procedure requires indirect preferences to be Euclidean (represented by concentric circles), so that an optimal choice for any voter in a given dimension is independent of the choice of policies in other dimensions (Ordeshook 1992, 283-5).

<sup>12</sup> The triumph of the middle class in such a context is often referred to as Director's Law (Stigler, 1970).

scratch my back and I will scratch yours') as a norm of behaviour that emerges to overcome political instability in legislatures, with each legislator agreeing to support the allocations most preferred by every other member. As long as the benefits of public spending are concentrated within particular electoral constituencies, while the costs are spread by the tax system over the country as a whole, the norm leads legislators to agree to larger budgets and greater use of special tax provisions than would occur if benefits and costs were matched more closely within each district.<sup>13</sup>

### 3.2 Probabilistic voting

The application of the median voter model points to the role of the skewness of income in determining the extent of coercive redistribution through the fiscal system, as well as to behavioral responses to taxation and the resulting welfare losses as factors limiting the overall size of government. Because of the manner in which equilibrium is established, the model has little to say about the tax skeleton or tax structure as a whole.

The probabilistic voting model provides a basis for analyzing the tax skeleton as a whole, and it does so by using an approach to the problem of establishing equilibrium that does not require the number of tax instruments to be severely restricted. This is a model of representative democracy in which political parties are forced to compete for votes in order to win the struggle for power. Just as in the median voter framework, the specific institutions that maintain and shape electoral competition are not formally represented in the model.

In addition to differences in constitutional setting, the probabilistic voting model also adopts an alternative approach to political behavior. While economic behavior and the structure of private markets are essentially the same in both frameworks, individual voting, while still sincere, is no longer deterministic, a fact suggested by the model's name. In a probabilistic setting, political parties do not know with certainty how any voter will behave at the polls. This is the key assumption allowing for the possibility that an equilibrium may exist, even if the tax system is multidimensional (Hinich 1977, Coughlin and Nitzan 1981, McKelvey and Patty 2001).

When voting is strictly deterministic, as in the median voter model, each voter will abruptly switch support from the incumbent to the opposition (or vice versa) if promised a sufficiently favorable policy outcome. The points at which voters switch their support from one party to another become the objects of a bidding war between the parties, leading almost inevitably to vote-cycling over alternative platforms. However, if voting behavior is probabilistic, a small change in a policy platform directed at any voter will lead at most to a small change in the probability of support from that voter, not to a total loss of his or her support. If, in addition to the probabilistic nature of voting, the objective functions of the parties - total expected votes or expected plurality - are also concave in policy choices for each platform of the opposition, a Nash equilibrium in the electoral game may exist despite the complexity of the fiscal system being decided upon.<sup>14</sup> In this setting, each party is forced by competition to maximise its total expected vote defined across all citizens, and the equilibrium

**There are also a few explorations of U.S. tax reform in the structure-induced equilibrium tradition, including Stewart (1992) and McCubbins (1992), who concentrate on the implications of a divided Congress for the politically feasible set of tax proposals.**

**<sup>14</sup> See Enelow and Hinich (1989) for a discussion of the conditions underlying the concavity of expected vote functions.**

in the model represents a balancing of the heterogeneous and conflicting economic interests of all citizens. Here every voter, and not just the median voter, has some direct political influence on the equilibrium fiscal system.

It should be noted that if the policies of opposing parties become very polarized, the probability that some radical voters will support the party at the other end of the spectrum may fall to zero. If this happens, the expected vote functions of both parties may not be sufficiently concave over the entire policy space, and a vote-cycle may reemerge (Usher 1995). Thus the instability of majority rule continues to cast a shadow, even in this framework. For this reason, use of the probabilistic voting model implies the important assumption that issues that would lead to extreme polarization of the electorate are kept out of the political arena, thereby limiting the domain over which policy instruments can be defined.

Since it is reasonable to assume that expected support for any party will rise with an increase in expected welfare for any voter, every party has an incentive to adjust the tax mix so as to make the aggregate excess burden of taxation as small as possible, although increases in the welfare cost of taxation will be tolerated if this allows for greater satisfaction of particular, politically sensitive or influential groups. For this reason, the probabilistic voting model is well suited to the study of how the full costs of taxation, including excess burden, are taken into account in determining the nature of the tax skeleton.

Each tax instrument, such as a particular tax base or special provision, will have a different loss of expected votes or political cost associated with it, reflecting factors such as the costs of organizing political opposition and the welfare losses resulting from the economic adjustments to the use of the instrument. Governments that are forced by competition to maximize expected support will thus aim for a tax skeleton that equalizes the marginal political costs of raising another dollar of revenues across tax sources. This logic will be familiar to those who adopt the optimal tax approach to fiscal design, although such logic must be substantially adapted in the present context. First we must allow for the difference between social welfare and expected political support, and second, we must acknowledge that the task is to characterize a political equilibrium that may or may not be efficient. (We consider the efficiency of political equilibria in the models we are discussing in section six below.)

In the probabilistic voting framework it is possible to understand how tax policy instruments may arise endogenously, if we acknowledge that systems which are costly to administer reduce the level of services and subsidies and hence the level of political support that can be obtained with a given total revenue (Hettich and Winer 1988, 1999 and Warskett et al 1998). Tax bases, rate structures and special provisions can be explained in this manner. To economize on the administrative costs of actually operating a tax system, governments must group related activities into composite tax bases to lower transaction costs for themselves - the costs of becoming informed about taxpayers, of designing tax structures, and of enforcing tax laws. In a similar manner, they combine taxpayers into rate bands, rather than taxing each individual at a unique rate. However, such grouping creates a loss in expected support, since differentiated treatment of heterogeneous taxpayers would maximize expected political support in a frictionless world. Governments must balance this loss against the gain in support from spending fewer resources for administrative activities and more resources for the provision of public goods.

By extension, similar arguments can also be used to explain the existence of special provisions. If there is a group which offers effective opposition to the inclusion of a specific economic activity in a particular base, it may be cheaper to placate it with a special provision, rather than with the creation

of a separate base for the disputed item. Thus, capital gains may become part of a fairly broadly defined income tax, while being taxed at a rate that differs from the rate applied to other types of income. It should be noted that in this framework, special provisions are a rational response by governments who expect to compete with opposition parties in future elections. They cannot be interpreted as deviations from some ideal tax base designed to satisfy particular normative criteria, which in actuality may have limited support among voters. Nor are they introduced primarily as a hidden substitute for direct subsidies, as is so often argued in the tax expenditure literature.<sup>15</sup> Special tax provisions would exist even in a world where no attempt is made to give direct subsidies to encourage particular activities.

Moreover, since revenue structures are equilibrium outcomes, they should be expected to adjust whenever a significant exogenous shock occurs, such as when some exogenous factor alters the size of a potential tax base and thus changes the economic and political consequences of relying on that tax source.<sup>16</sup> We should therefore expect tax systems to change frequently, although this will not be a sign of political instability or of 'tax reform'.

The focus on the equilibrium mix of policies also has other important implications for positive tax analysis. For example, it casts doubt on the separate treatment of particular sources of revenue, such as tariffs, debt or seignorage, which have often been studied without reference to the rest of the fiscal system. Tariffs are an instrument of protection, but they were also a major source of revenue of the advanced democracies in the 19th century and are still important revenue producers in many less developed countries today. In the probabilistic voting framework, the setting of tariffs will involve tradeoffs between protection and revenue, as well as tradeoffs between tariffs and other sources of revenue (Winer and Hettich 1991). Similar arguments will also apply to the study of debt or to seignorage, or for that matter, to the study of other single revenue sources.

At a more abstract level, the issue raised here concerns the difference between partial and general equilibrium analysis of tax instruments, a distinction made on the left side of Figure 1. Analysis of a part of the whole tax system is often a productive way to proceed, just as limiting the analysis to one private market allows for greater focus and detail. But at the same time, such an analysis must be carried out while remaining cognizant of the broader equilibrium setting.

A further illustration of general equilibrium analysis applied to the tax skeleton that is made possible by probabilistic voting concerns the so-called "flat" tax, which we will interpret for argument's sake as a uniform proportional tax on a single base with only limited exemptions. If special provisions are indeed a means of making the fiscal system politically more efficient, helping to adapt taxation to the characteristics of voters in an administratively effective manner, as was suggested above, it will be unlikely that a policy can succeed that removes this type of policy instrument completely. We may therefore expect democratic tax systems to be complex. While "reforms" can occur that simplify tax

<sup>15</sup> The tax-expenditure literature is derived from the work of Henry Simons (1939) who argued for a tax on comprehensively defined income as the mainstay of the tax system. A tax-expenditure is a deviation of actual tax payments from tax liabilities that would apply if taxation was levied on this ideal base. We consider Simons' approach to taxation further in section six.

<sup>16</sup> If the size of a potential tax base expands, we may expect the marginal excess burden of relying more heavily on that source to fall relative to the excess burden from using other bases. Opposition to increasing reliance on the growing base may also decline because the fixed costs of organizing opposition are spread across more taxpayers.

laws to some extent, if this becomes a politically popular aim, the result will probably be a fiscal system that retains considerable complexity.

Finally, one should note the implications of taxation for the use of other policy instruments. Any constraint on the use of a particular fiscal instrument, such as imposition of a 'flat' tax on income, may lead to the introduction of more special provisions in other tax bases, or to the increased use of policy instruments such as regulation, which can have similar economic effects on voters. Forced simplicity in taxation may thus lead to additional, and perhaps more obscured, complexity in other places.

In summary, the probabilistic framework predicts stable equilibrium outcomes for choices in multiple dimensions. It emphasizes the incentives that governments have to deal with the full costs of taxation, while taking the relative political influence of various groups of taxpayers into account and making it possible to show how the tax skeleton arises endogenously. On the other hand, the model has not been used extensively to study coercive redistribution, and it lacks specific institutional features and detailed references to actual governing arrangements, a limitation that also affects the median voter model.

#### 4. Statistical Research

A complete program of work on the political economy of taxation will include statistical modeling and testing of hypotheses in addition to theoretical work. It may also involve the construction and use of computable general equilibrium models. In this and the next section, we complete the coverage of the elements of a comprehensive approach depicted on the left side of Figure 1 by considering how the two approaches have been used to inform empirical research.

Statistical analysis using the median voter and probabilistic voting models can be compared by imposing restrictions on the following system of semi-reduced form equations:

$$s_k = s_k(s_1, s_2, \dots, s_{k-1}, \dots, s_{k+1}, \dots, s_K, G, x); \quad s_k \geq 0; \quad k = 1, 2, \dots, K \quad (1a)$$

$$G = G(s_1, s_2, \dots, s_K, x); \quad G > 0. \quad (1b)$$

Here time subscripts and error terms are omitted, revenue structure  $s = \{s_1, s_2, \dots, s_K\}$  includes all tax bases, rate structures and special provisions that define the tax skeleton,  $G$  equals the level of public expenditure, and  $x$  is a vector of conditioning variables including, in principle, all exogenous or predetermined factors relevant to decisions by economic and political agents.

These equations are consistent with a wide variety of models of political equilibrium. They acknowledge that in an equilibrium, the use of any policy instrument depends in general on the setting of all other instruments. For example, tax structure depends on how much revenue in total is to be raised, and the reliance on any particular type of tax depends on how much revenue is raised in other ways.

While the equations are quite general, they still omit many aspects of fiscal structure. In particular, the formation of the tax instruments themselves is suppressed as is the structure of public expenditures. Relationships between fiscal instruments and other policies such as regulations and laws are ignored.

Moreover, fiscal institutions are not explicitly represented, although their effects will be embedded in the coefficients of the estimating equations and might be included to some extent in the vector of exogenous factors.

To our knowledge, no one has yet estimated such a system to explain a complete tax structure consisting of bases, rates and special provisions. The problems of doing empirical research with such general systems resemble the difficulties associated with empirical work in any general equilibrium context. In fact, the problems are more acute here than is the case in the study of the private economy since the equilibrium framework must take account of the interaction between the private economy and the political system. In such a setting, it is often useful to proceed by simplifying further, while justifying why some particular part of the larger fiscal system is deserving of special attention.

Researchers who base their work on the median voter model have focused on the implications of coercive redistribution for the overall level of taxation. In this case, the number of fiscal instruments is usually reduced to two (that is, usually  $K = 1$ ), such as a single proportional tax rate in addition to the overall level of public expenditure. Specific estimating equations are derived by maximization of the median voter's utility subject to the relevant constraints. The vector  $x$  of exogenous variables reflects the median voter's characteristics, such as his or her income, and the factors that determine behavioral responses to taxation.

When  $K$  is equal to one, the government budget restraint will determine one of the two policy variables, and estimation of only one equation has to be carried out (see for example, Meltzer and Richard, 1983). It should be noted that modeling the average tax rate on a particular base, such as income, rather than modeling an overall average rate, is not a proper empirical application of the median voter model. This must be so unless one believes that coercive redistribution is only exercised via income taxation.

Implementation of the estimating equation requires that the researcher first figure out who the median voter is, and this usually involves additional assumptions so that the median voter can be identified as the person with median income. The ratio of mean to median income is a critical explanatory variable resulting from application of the model, with skewed distributions hypothesized to lead to larger public sectors, and with more elastic behavioral responses expected to offset this tendency.

Another approach to applying the median voter model starts with an assumption that a complex tax structure is fixed independently of public spending. The median voter model is then solved for the level of public expenditure most desired by the median voter as a function of exogenously given tax shares and other factors (Borchert and Deacon 1972, Bergstrom and Goodman 1973).

There is an extensive body of empirical work, which we cannot review here, in which the median voter model is used to explain the overall size of government for different political jurisdictions. It is fair to say that over the last three decades, this approach has dominated empirical public choice.

More recently, the probabilistic voting model has been applied to model tax systems where  $K$  in (1a) and (1b) is equal to two or more. In these applications, the instrument set  $S$  is usually interpreted as the shares of total revenue coming from several sources such as profits, personal income, consumption, trade, property, seignorage and public debt. Instead of including characteristics of the median voter, the vector  $x$  now consists of exogenous factors that determine the marginal political costs associated with relying on each revenue source. These include the factors determining the full

economic costs of each tax source, such as the size of potential tax bases, and the factors determining how the full costs of raising revenue in each way are translated into political opposition.<sup>17</sup>

Empirical work of this nature has been conducted by Pommerehne and Schneider (1983) who model the revenue structure of Australian national governments, by Winer and Hettich (1991) for the government of Canada in the 19th century and by Kenny and Winer (2001) for a sample of 100 countries. Some research in this vein considers just one or two parts of the larger equilibrium system. Moomau and Morton (1992), for example, limit themselves to the property tax, Winer and Hettich (1992) look at the relationship between state income taxation and special provisions for the property tax, while Kenny and Toma (1997) examine the choice between income taxation and the inflation tax in the US. Chernick and Reschovsky (1996) use a partial approach to study determinants of tax progressivity among U.S. states.

#### *4.1 Some evidence concerning the role of institutions*

The role of political institutions is only implicit in the empirical work described above, as it is in the theoretical models that underlie these applications. By estimating reduced form equations across electoral systems, or by doing analogous case studies, interesting stylized facts about the role of institutions can be generated.

There is a growing body of work of this kind, much of it dealing with the consequences of alternative electoral systems for the overall level and composition of spending (see Kirchgaessner 2002 and Gould and Baker 2002 for reviews, and Persson and Tabellini 2001 and Milesi-Ferretti et al 2002 for recent contributions). As yet, few studies relate electoral systems or other aspects of governance to specific features of the tax system except at an aggregate level. However, existing research points to future directions for work applied more directly to taxation.

Of particular interest is a branch of the literature that investigates the relationship between electoral systems or structural characteristics of government and overall fiscal discipline. Persson and Tabellini (2001), for example, find that aggregate spending and deficit financing is less responsive to the economic shocks in presidential regimes and under majoritarian elections (where a first-past-the-post rule is coupled with single member constituencies) than in parliamentary regimes using proportional representation.

Using data on OECD countries, Ashworth and Heyndels (2002) investigate how volatility in tax systems is affected by the degree to which government is fragmented, while Volkerink and de Haan (2000) ask similar questions with regard to reliance on deficit financing. Fragmentation is measured by the number of decision makers involved in fiscal decisions or by the number of parties in a governing coalition. Their studies show that fragmented governments tend to have tax systems that exhibit more persistence in the face of exogenous shocks, and larger deficits.

The effects of legislative rules and laws for insuring that at an aggregate level at least, spending is kept in line with revenues have also been investigated. Many of these studies, reviewed in Kirchgaessner (2002) and Poterba (1997), use data from U.S. states. It appears that balanced-budget

<sup>17</sup> See Hettich and Winer (1999, chapter 8) and Kenny and Winer (2001) for further details.

rules and other types of limitations have to some extent been successful in linking spending to available revenues and in inducing somewhat more rapid fiscal adjustments.

There is also some statistical evidence concerning the role of specific policy processes in linking spending and taxing. In an analysis of European Union countries, von Hagen (1992) finds that overall fiscal discipline is stronger where there is a top-down budgetary process run by a strong Prime Minister, and where parliament has limited powers of amendment.<sup>18</sup>

Finally, there is some exploratory work on institutions that bears on the nature of the tax skeleton. Hettich and Winer (1999, chapter 11) use descriptive statistics to show that the Canadian tax system is less complicated and involves more frequent major reforms than that of the U.S., a result they explain with the greater transactions costs facing politicians in the congressional system, characterized by checks and balances, than in the Canadian parliamentary setting. And Steinmo (1993) uses the case study method in an interesting attempt to relate stylized differences in tax structures among Sweden, the U.K. and the U.S. to differences in their political systems.

This is a rapidly evolving literature. It would be of much interest if research of this nature could be grounded in the application of formal structural models in which the tax skeleton is represented. To accomplish this is particularly difficult for electoral systems based on proportional representation because of the well recognized problem of modeling the post-election bargaining among prospective coalition members that affects final equilibrium policy outcomes.<sup>19</sup>

## 5. Computable Equilibrium Modeling and the Representation Theorem

Another way to further our understanding of taxation is by constructing an applied or computable equilibrium model that can be used for simulation. Rather than being estimated econometrically, these models are calibrated either to synthetic or real data sets for specific jurisdictions at a point in time.

In applying the median voter framework, one must specify how the private economy depends on the tax instrument or size of government that is determined in political equilibrium. (The structure must be such as to insure that voters' preferences are single peaked over the relevant policy instrument.) Public policy is chosen so that, given the relationship between the median voter's well-being and the private economy, the median voter's welfare is maximized. When a computable model of a federal system is constructed and the median voter model is applied at each level, it is necessary to assume

**But see also Bohn and Inman (1996). Breton (1996) models the power of a Prime Minister in a parliamentary system to control spending and compares this power to that of the President in a U.S. congressional system of checks and balances. He suggests that a strong Prime Minister backing a strong Minister of Finance coupled with traditions of budgetary secrecy and cabinet solidarity combine to offer distinct advantages for maintaining the overall balance of spending and taxing.**

**<sup>19</sup> Austen-Smith (2000) builds on the median voter model, and on models of agenda control by Romer and Rosenthal (1978) to formally compare the average rate of tax in an electoral system with a FPTP to one in a three-party system with PR. Austen-Smith's study is motivated by the desire to model the observation that average income tax rates appear to be higher and post tax distributions of income flatter in countries with proportional representation, than in countries with a first-past-the-post electoral system. The key to his explanation appears to lie in differences between electoral systems regarding the pivotal or decisive voter and the incentives created for taxpayers to choose among available occupations.**

that voters make their decisions about whom to support in each election without considering the consequences for policy at other levels of government.

Nechyba (1997, 1999) explores various issues, including the setting of property tax rates and the effects of school vouchers, in a large scale median voter model of the relationship between state and local governments. The model allows for tax competition between cities and interjurisdictional migration and is calibrated to data for New Jersey. Voting decisions at each level of government are assumed to be independent in the minds of the voters, and at each level the median voter is decisive. Holtz-Eakin (1992) has constructed a synthetic political economy in order to compare the results of various experiments based on the median voter theorem to results when a probabilistic voting approach is used with the same data.

In a computable version of a probabilistic voting model, what is optimized by the choice of (several) policy instruments is a political support function defined across all voters, rather than the median voter's utility. This technique is illustrated at some length below. Work of this sort includes Rutherford and Winer (1999,2002) and Hotte and Winer (2000), who use the model to work out the effective political influence that must be imputed to each of several groups of voters so that the model replicates a benchmark fiscal system (the U.S. rate of tax on labor, capital and the size of government in 1973 and 1983). These weights are then used to construct counterfactuals that allow changes in the benchmark system over time to be decomposed into a part due to changing economic structure and a part due to changes in relative political influence.

Since it will be useful in the next section where normative issues are considered, we illustrate the derivation of the optimization problem referred to above that can be used to compute an equilibrium in a probabilistic model. This derivation is based on the work of Coughlin and Nitzan (1981).

To simplify, we limit the discussion to a situation with two political parties, two tax bases, two tax rates and one public good. To acknowledge tax administration and information costs implicitly, we assume that the number of tax rates is less than the number of voters and that taxation is proportional rather than lump sum. Indirect utility for voter  $h$  is  $v_h(t_1, t_2, G)$  and, after substitution of the general equilibrium structure of the private economy, the government budget restraint can be written as  $G = R_1(t_1, t_2, G) + R_2(t_1, t_2, G)$ .

Each party chooses tax rates and the size of public expenditure to maximize its total expected vote. The probability that voter  $h$  supports the incumbent as perceived by the party,  $f_{hi}$ , depends on the difference in the voter's evaluation of his or her welfare under the incumbent's policies (i) and those of the opposition (o):  $f_{hi} = f_h(v_{hi} - v_{ho})$ . The expected vote for the incumbent government then is  $EV_i = \sum_h f_h(v_{hi} - v_{ho})$ , and the vote for the opposition is defined analogously. In addition, we assume that knowledge of the probability density functions describing voting behavior and of the structure of the private economy is common to the competing parties.

Given the platform of the opposition, first order conditions for the choice of tax rates that maximize  $EV_i$  subject to the budget restraint are of the form

$$\frac{\sum_h \partial f_h / \partial v_h \cdot \partial v_h / \partial t_1}{\partial (R_1 + R_2) / \partial t_1} = \frac{\sum_h \partial f_h / \partial v_h \cdot \partial v_h / \partial t_2}{\partial (R_1 + R_2) / \partial t_2} \quad (2)$$

From (2) it can be seen that the platform chosen by the incumbent equalizes the marginal effect of tax policies on expected votes per dollar of revenue across tax sources. The condition illustrates the equalization of 'marginal political costs' across tax instruments referred to earlier. A Nash equilibrium, if it exists, is a simultaneous solution to such first order conditions for both incumbent and opposition parties.<sup>20</sup>

After substitution of equilibrium values of the partial derivatives in (1), the resulting condition can also be used to characterize the tax system that emerges in a Nash equilibrium. Let  $\theta_h = \partial f_h / \partial v_h$  be the particular values at a Nash equilibrium of the sensitivities of voting to a change in welfare, and let the other partial derivatives also be evaluated at the equilibrium. Then the first order conditions characterizing optimal equilibrium strategies take the form:

$$\frac{\sum_h \theta_h \cdot \partial v_h / \partial t_1}{\partial (R_1 + R_2) / \partial t_1} = \frac{\sum_h \theta_h \cdot \partial v_h / \partial t_2}{\partial (R_1 + R_2) / \partial t_2} \quad (3)$$

Now it can be seen that this equilibrium condition may be replicated by solving a particular optimization problem. It is straightforward to show that maximization of the following 'political support function' ( $S$ ) by choice of the same policy instruments, subject to the same government budget constraint, leads to the identical condition:<sup>21</sup>

$$S = \sum_h \theta_h v_h \quad (4)$$

The use of this optimization problem to compute a political equilibrium constitutes what we shall call the Representation Theorem.<sup>22</sup> Note that since  $S$  is maximized in a political equilibrium, it makes sense to think of the weights  $\theta_h$  in the support function as measures of the effective influence exerted by different voters on equilibrium policy outcomes.

As well as permitting the probabilistic voting model to be operationalized, the Representation Theorem has important implications for the normative evaluation of tax systems.

## 6. Normative Analysis

In our initial discussion of the elements depicted in Figure 1, we pointed out that a fully general approach would have a normative as well as a positive dimension. Although there is an extensive literature using collective choice models as a basis for positive theoretical and empirical research, there is only a limited body of work on how to explicitly link them to normative questions. Filling in the boxes on the right side of Figure 1 remains a challenging task. In this section we consider some of the issues involved in using the median voter and probabilistic voting models to do so. We also

<sup>20</sup> Neither the existence of an equilibrium (nor the convergence of platforms that occurs in this version of the model) is guaranteed under all conditions.

<sup>21</sup> Second order conditions sufficient to insure the existence of a constrained maximum must also be satisfied. For further details see Coughlin (1992) and Hettich and Winer (1999).

<sup>22</sup> Note also that the support function  $S$  is not a social welfare function. The weights in  $S$  are determined *within* the model by voting behavior, and different types of behavior will give rise to different support functions (see Coughlin 1992).

briefly consider some other contributions to the normative literature in the light of the comprehensive approach to political economy.

In normative analysis, we evaluate imperfect situations by comparing them to a state that has defined optimal properties. Three steps are needed in this kind of work. To start with, one must define a counterfactual or standard of reference representing an optimal allocation of resources. The underlying theoretical analysis must prove that this allocation exists and that it is a stable equilibrium outcome of a relevant or acceptable collective choice process. (It should be recalled that public goods and the corresponding taxes cannot be allocated or distributed without recourse to a collective choice process.)

Once this has been accomplished, a second step becomes possible. Imperfect situations can be contrasted with the socially optimal, democratically arrived at allocation. Finally, the loss in welfare resulting from the imperfect operation of the decision process is measured in monetary terms.

The three steps are well-known from neoclassical welfare economics relating to competitive markets, where the First Theorem serves to define the ideal counterfactual or standard of reference, and where the second step is represented by the analysis of market failure. In a final step, the implications of imperfect markets are then measured by quantifying the resulting welfare losses.

Although the same sequence of steps must be followed in a normative analysis of taxation that includes collective choice as a significant component, there are important differences of interpretation. Since the relevant equilibria must now refer to a political process, the counterfactual, as well as the analysis of imperfections, must refer to the working of political mechanisms rather than to the operation of private markets. Thus, we are interested in the identification and measurement of the consequences of *political* market failure. This involves identifying the sources of such failures, and then relating such failures to specific identifiable parts of tax structure that are undesirable as a result. Such a political market failure analysis of tax policy remains to be accomplished.<sup>23</sup>

The importance of establishing a normative analysis that includes collective choice in such a systematic manner can be better understood if we use it to evaluate a well-known result derived from the social planner model where politics play no role. The latter approach has been widely used to argue for tax policies that minimize excess burdens measured in relation to lump sum taxation. To achieve such minimization, it is necessary to adjust the tax system so as to equalize the marginal excess burden created by raising an additional dollar of revenue across all different tax sources.

The limitations of this sort of policy recommendation can be seen clearly if we ask the same questions in a framework based on a collective choice model such as probabilistic voting. In a probabilistic voting model, political competition tends to force parties to adopt Pareto efficient policies. Otherwise the possibility remains that the opposition can propose a Pareto improving policy platform and thereby increase its expected electoral support. This tendency is readily apparent from

**Political failures may occur as a result of lobbying and the use of advertising to sway voters, or in a dynamic context where the problem is to insure the consistency of policies over time. Contributions on the first aspect of political economy are reviewed in Grossman and Helpman (2001) and on the second in Drazen (2000, chapters 4-6). The link to specific features of tax systems in this literature remains to be more fully developed. In this regard, see also footnote 25 below. Political market failure may also result from unregulated tax competition between jurisdictions: the relevant literature is reviewed by Wilson (1999).**

the Representation Theorem stated in the previous section, which shows that under certain conditions, the equilibrium can be replicated by maximizing a particular weighted sum of utilities subject to the general equilibrium structure of the economy.<sup>24</sup>

This does not imply, however, that marginal excess burdens per dollar, or marginal efficiency costs, will be equalized across tax sources, thereby minimizing total excess burden. The reason is that voters differ in their effective political influence even when the franchise is universal. Hence in directing resources towards voters who the governing party thinks are especially influential, the incumbent party will accept an increase in the marginal efficiency cost of a particular tax source above that of other taxes if it thinks this will improve the chances for reelection.

We can clarify this point by continuing with the development of the model introduced in section five. Using condition (3) in the special case where the equilibrium political influence weights (the  $\theta_h$ 's) for all voters are equal, we can substitute the change in aggregate welfare defined by  $W_k = \sum_h \partial v_h / \partial t_k$  into (3), subtract 1 from each side, and simplify to get

$$\frac{W_1 - \partial(R_1 + R_2)/\partial t_1}{\partial(R_1 + R_2)/\partial t_1} = \frac{W_2 - \partial(R_1 + R_2)/\partial t_2}{\partial(R_1 + R_2)/\partial t_2} \quad (5)$$

Here the numerator on each side of the equation is the marginal excess burden of the corresponding tax change - the change in welfare over and above the change in revenue - while the quotient on each side of (5) represents the marginal efficiency cost of each tax source.

Thus if the  $\theta$ 's are all equal, the tax system equalizes the marginal costs per dollar across tax sources and hence minimizes the total excess burden of taxation. On the other hand, if political influence is distributed unequally as in (3) and (4), unweighted marginal welfare losses for different tax sources may vary significantly as parties trade off the welfare of and support from different voters, even though Pareto efficiency is being achieved.

In other words, by weighting welfare changes for different people equally, traditional normative analysis imputes all observed inequality of marginal efficiency costs to the inefficiency of tax policy. This is an extreme view, given the existence of vigorous political competition for the support of rational economic agents.<sup>25</sup> Even if we allow for the existence of political market failures, which we

<sup>24</sup> We have implicitly assumed that political competition is perfect, in the sense that parties must continually maximize expected votes, and that no one can systematically influence voters with advertising misrepresenting how policies will affect individual welfare. If these conditions are not met, the equilibrium will not be efficient, and the optimization problem that is used to replicate the equilibrium will be different from what has been stated above. See Hettich and Winer (1999, chapter 6). Other situations may also lead to political market failure.

<sup>25</sup> An important general lesson here is that normative analysis that is not informed by a model of political equilibrium is likely to be misleading. Another interesting example of this is provided by the literature on the time-consistency of public policy. A policy is not time consistent if it requires a course of action today (about today and tomorrow) that will subsequently become undesirable. It is often argued that the inability of governments to commit to consistent policy over time will result in a loss of social welfare compared to a situation where governments are prevented from adopting discretionary policies based on period by period political optimization. (see, for example, Fischer 1980). The problem with this and similar arguments is that it does not allow for the constraints on misuses of discretionary power that exist in a democracy (Hettich and Winer 1985, Marceau and Smart 2002). People in democratic societies are not powerless in opposing unwanted government actions using normal political channels. Moreover, we may also find the legal system being altered to make it difficult for governments to unilaterally

have not done here, at least some part of the inequality of marginal efficiency costs in equilibrium will still be due to the pursuit of support from voters who differ in their effective political influence. (What part of the inequality is actually due to political market failure is unknown, and little studied.) Moreover, proceeding as if the marginal efficiency costs should be equalized when political influence actually differs across groups of voters may lead to reforms that only serve to move society along or possibly even inside of the Pareto efficiency frontier.<sup>26</sup>

Cost-benefit analysts have long recognized the problem of determining the proper direction of reform when the weights attached to various groups of people are not equal.<sup>27</sup> They have tried to infer such distributional weights (as they are called in this literature) from existing data and to use them in aggregating losses and gains for different groups.<sup>28</sup> Whether weights derived from existing political equilibria, which may be imperfect, are appropriate for normative analysis is unclear.

There is as yet no consensus on what institutional characteristics of the voting process would be required to yield an ideal outcome, or on what weights would be embedded in the equilibria arising in such a system. As a result, definition of a counterfactual ideal and measurement of losses as a consequence of political market imperfections remain unsolved analytical problems in the approach based on probabilistic voting, and in related or similar approaches.

What is the nature of normative analysis in work based on the median voter framework? While the probabilistic voting model emphasizes the problems of reconciling conflicting and heterogeneous interests, the median voter model draws our attention primarily to the consequences of coercion under majority rule.

There is an analogue to the role of the Representation Theorem in normative work based on the median voter model. It involves the demonstration that total revenue, or the aggregate tax rate, are efficient in equilibrium under certain special circumstances. The question of what the required conditions are has been extensively explored, with rather discouraging results. Efficiency of the public sector in this world will only occur in the special and rather unlikely case where preferences are symmetrically distributed around those of the median voter, so that the consequences of coercion for the welfare of voters on either side of the median just balance out (Bowen 1968, Bergstrom 1979).

Individual preferences are usually taken as given and inviolable. So it would be understandable if a policy analyst in search of efficiency, who based his analysis on the median voter model, were led to propose changes in the basic voting rule, rather than in particular policies, as a way of improving the allocation of resources.

**expropriate private property. As a result, it is not obvious that further restrictions on the ability of governments to respond to changing events, which must have social costs as well as benefits, are warranted to counteract possible time inconsistency.**

<sup>26</sup> For related but different arguments concerning the problems of doing welfare analysis without taking political equilibrium into account, see Coate (2000) and Besley and Coate (2002).

<sup>27</sup> See for example, the text by Boardman, Vining and Weimer (1996, chapter 2).

<sup>28</sup> Rutherford and Winer approached this issue by calibrating the weights so that maximization of the support function replicated the benchmark equilibrium.

## 6.1 Limiting majority rule.

Proposals for reform of the basic voting rule have a long history in the literature on taxation. There have also been several proposals to constrain the use of policy instruments as a way of indirectly limiting the exercise of coercion. Such proposals are not usually associated with either of the two formal models we have been analyzing. Nonetheless, to complete the discussion of normative tax analysis, it is of interest to briefly consider some of this work. The discussion will also point to the difficulties of normative theorizing without the use of a comprehensive framework.

As we noted earlier, Wicksell (1896) advocated the adoption of a qualified or approximate unanimity rule to limit coercive redistribution through the public sector. Of course he did not use the median voter model as a basis for his proposal. But he clearly understood the essential link between collective choice and the allocation of resources, and realized the dangers that are inherent in majority rule. He proposed an institutional solution in his perceptive analysis of what would be required to generate a more efficient political equilibrium in a democratic society.

Wicksell's analysis is an example of a 'process-oriented' approach to reform. His analysis does not include a blueprint for tax structure, and is confined to reform of the policy process. A concern with the coercive power of government also lies behind more recent process-oriented proposals. These involve detailed tax blueprints, the purpose of which is to make it difficult for democratic governments to engage in coercive actions while still permitting them to finance needed public services.

Simons (1938) was a successful advocate of a process-oriented approach to restricting the power of government to coerce private citizens. He was not primarily concerned with coercive redistribution between rich and poor, and was content to leave the determination of vertical equity to the political process. He argued instead for a tax levied on comprehensively defined income as a way of limiting the ability of governments to interfere in private markets (or, as he put it, to 'dip deeply into great incomes with a sieve'). Buchanan and Congleton (1998) have recently proposed a flat tax without exemptions, based on concerns similar to those expressed by Wicksell and Simons.

Normative tax theory after 1945 was dominated by discussion of the comprehensive income tax system advocated by Simons, until Optimal Taxation replaced his approach in the early 1970's. Simons' work also stimulated several important tax commissions during the period. This occurred even though the political foundations of Simons' argument for the comprehensive income tax were not generally appreciated.<sup>29</sup>

While not clearly connected to a formal model of political equilibrium, the arguments of Simons and Buchanan and Congleton carry with them a statement of what the ideal tax system should look like. As a result, they allow identification of the parts of existing tax systems that are undesirable, and measurement of departures from the ideal then becomes possible. These are key steps in a comprehensive normative analysis of taxation.

**See Hettich and Winer (1985, 1999) for review of the relevant literature on this point. It is of interest to note that measurement of deviations from the broadly based personal income tax, following Surrey (1973) and others, is the basis of tax-expenditure budgets, which have even been enshrined into law in some countries.**

However, there is a serious flaw in the design of the tax blueprints advocated by those concerned with the coercive power of government. These proposals are at odds with the understanding of political equilibrium developed using the probabilistic voting approach. In this framework, political competition creates pressures for any government to implement a tax system that is, to some extent, adapted to deal with excess burdens. As we have already seen, competition in such a political system pushes the government to implement a complicated tax skeleton which is unlikely to resemble the fiscal structures advocated by Simons or by Buchanan and Congleton.

## 6. Conclusion

There has been much work in the past two decades that approaches public sector problems from a political economy perspective. This is true for issues relating to taxation as well as for topics touching on other aspects of the public economy. Most of this research has not been part of a broad, comprehensive framework of the sort outlined in Figure 1 however. Authors have mostly focused on one specific aspect or problem, and have used a particular collective choice model to deal with a question or topic of limited scope.

We show in this chapter that public sector analysis can be carried out as part of a comprehensive theoretical framework. Although the discussion is concerned primarily with taxation, it has implications for all research on the public economy that acknowledges the necessity for collective choice. A truly general framework will allow for analysis of positive as well as of normative questions and will link the two areas of inquiry in a meaningful fashion. While most individual studies will continue to focus on some particular aspect of the government sector, their implications for related questions can be better understood when they are evaluated against the background of an inclusive approach.

Taxation is a crucial topic in public finance. It touches directly on the need for a collective choice mechanism, and it involves analysis of coercive redistribution arising from the use of majority rule. In addition, it requires an understanding of how tax systems are structured to deal with the welfare losses stemming from the separation of spending and taxing, a separation that arises from the very nature of public goods.

When using collective choice models to examine these issues, we must confront the theoretical problems related to existence and stability of equilibrium. Otherwise, predicted policy outcomes may be only transitory phenomena, unsuitable for comparative static analysis, the method of research that has provided the logical underpinning of most work in economics. Moreover, equilibrium must now include political as well as economic forces.

In this chapter, we focus on the two main collective choice models that have been used to examine taxation, namely the median voter model and probabilistic voting. In each case, we examine the nature of equilibrium analysis, along with the contributions of the model to the understanding of major fiscal issues. Although both approaches have given rise to extensive literatures from which many useful insights can be derived, our review shows that probabilistic voting is able to encompass a wider range of questions. In particular, this model allows for the examination of both positive and normative questions, while the median voter model has little to say on the efficiency of taxation. Regarding theoretical and empirical research, median voter analysis has provided a strong focus for the examination of coercive redistribution, but it has not proved suitable for the study of tax structure and tax design due to its limited success in dealing with multi-dimensional issues. Probabilistic

voting provides an appropriate basis for studying the nature of observed tax systems, and it can, at least in principle, also be used to shed light on coercive redistribution.

Both models still fall short of integrating into the analysis the wealth of existing fiscal institutions within which the exchange between citizens and governments occurs. While there is work on fiscal institutions, it is largely limited to linking them to the aggregate level of spending or to attempts to control budget deficits. Research in this area only rarely deals with specific features of observed tax systems or fiscal structure. A framework that encompasses taxation as an instrument of coercive redistribution, that can explain the tax skeleton and its relationship to excess burden, that accounts for the role of administration costs, and that assigns an explicit role to fiscal institutions remains to be constructed.

Whatever approach is chosen in future work, the nature of equilibrium remains crucial. If it is ignored, analytical results may be doomed to irrelevance or disregard in the political arena, a fate that has befallen a large number of proposals for a comprehensive income or consumption tax or a generalized flat tax. Advocates of such taxes have never demonstrated that they represent equilibrium outcomes of an acceptable and democratic collective choice process. Research based on probabilistic voting strongly suggests that democratic regimes will inevitably create complex tax systems with multiple bases, varied rate structures and a myriad of special provisions.

Although a comprehensive approach remains to be fully developed, consideration of existing work against the background of a generalized framework helps in seeing the strengths and weaknesses of available models and is useful in guiding the researcher in future work. It also makes clear that much has already been accomplished, and that the collective choice literature devoted to taxation is a rich and valuable source of analytical and policy-relevant insights.

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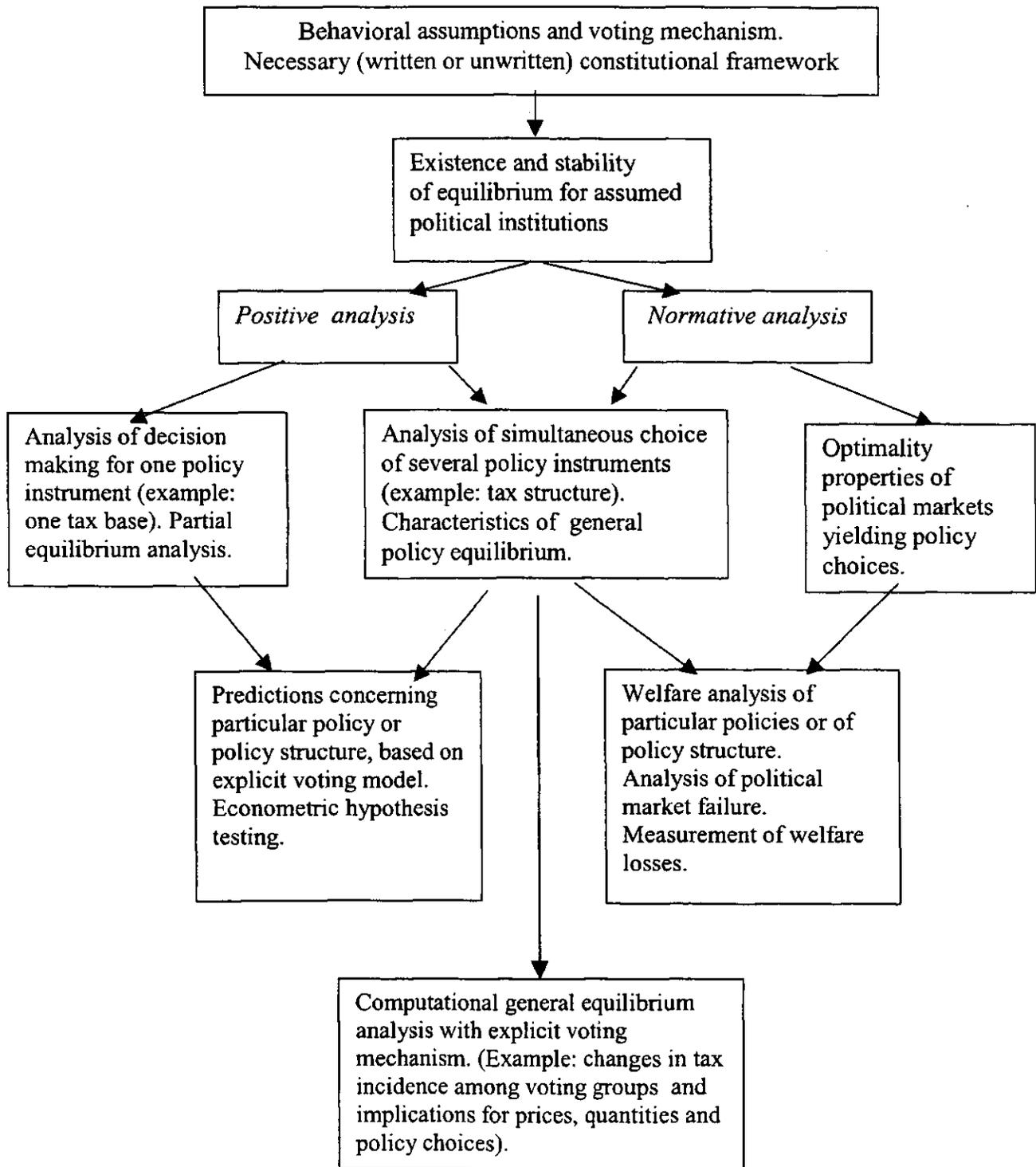
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Figure 1

**A COMPREHENSIVE ANALYSIS OF TAXATION  
WHEN COLLECTIVE CHOICE MATTERS**



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