Information, Co-ordination, and Tax Policy Making

by

Stanley L. Winer* and Walter Hettich**

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* School of Public Administration, Carleton University, Ottawa, Ontario, Canada, K1S5B6. (stan_winer@carleton.ca)

** Department of Economics, California State University, Fullerton CA, USA, 92834. (whtch@aol.com)

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Abstract

Although the Optimal Tax literature contains a rich variety of theoretical results, it has had a limited impact on the design of actual tax policies. Those concerned with reform of particular tax systems raise two fundamental criticisms. The first emphasizes the information requirements of OT. Since optimal tax plans take account of the general equilibrium structure of the economy, they tend to be complicated and complex. A second criticism focuses on the decision-making process. Since tax policies must be adopted in a political setting and using the advice of the bureaucracy, one may question whether normative analysis can abstract from the collective choice and tax policy processes that underlie the determination of goals and the adoption and implementation of policy**.**

In this paper we argue that the information requirements facing political parties and tax policy makers are even greater than those confronted by an optimal tax planner. We then focus on possible solutions to the information problem facing public decision makers in a collective choice setting. We argue that the answer lies in decentralized information gathering and policy processes rather than in the development of simplified guidelines (such as tax neutrality) for improving the decisions of central planners, a lesson that may also apply to optimal tax analysis

1. Introduction

The publication of the Carter Report (1966) probably represents the apogee of traditional advocacy for a comprehensive income tax in the Haig-Simons tradition. Shortly thereafter, the economic analysis of taxation took a different turn. Following the work of James Mirrlees (1971) and others, Optimal Taxation (OT) rapidly established itself as the most influential normative approach. Developed as an extension of welfare economics, OT provides a guide to the design of tax systems that are to be implemented by a social planner having no political or economic agenda of his own. Optimal tax plans reflect the two concerns most widely emphasized in normative analysis, efficiency and distribution. Most commonly, they are designed to collect a fixed amount of revenue in a manner consistent with equilibrium in private markets that keeps welfare losses to a minimum, while at the same time achieving the distributional goals expressed in a given welfare function.

Although the OT literature contains a rich variety of theoretical results, it has had a limited impact on the design of actual tax policies. Those concerned with the reform of particular tax systems raise two fundamental criticisms. The first concerns the informational requirements of OT policies. Since optimal tax plans take account of the general equilibrium structure of the economy, they tend to be highly complicated and complex. Implementation of optimal commodity taxation, for example, would require very extensive information on economic margins and elasticities. In practice, such knowledge can be acquired only at very high cost. The problem is particularly acute in developing countries, where the necessary information systems are largely absent, but it also exists in more developed nations, where planners face a bewildering array of different goods and constantly changing market conditions.

Suggestions in the OT literature for dealing with the information problem center around rules of thumb, or simplified guidelines such as tax neutrality. As one writer has put it:

> While not nearly as intellectually satisfying a guide to tax policy as "optimal taxation," neutral taxation is to be preferred as a benchmark until such time as analysts are able to identify optimal departures from neutrality in real world policy settings, and until such time as administrative capacities are equal to the task of operating necessarily complicated optimal tax structures. In both developed and developing countries that time will not likely arrive before the twenty-first century.[1]

A second line of criticism directed at OT theory focuses on the decision-making process. Since tax systems or policies must be adopted in a political setting and using the advice of the bureaucracy, one may question whether normative analysis can abstract from the collective choice and tax policy processes that underlie the determination of goals and the adoption and implementation of policy. While writers on OT at times acknowledge the existence of political and bureaucratic constraints that may prevent adoption of suggested tax policies or force alterations in their design, they have not as yet dealt with tax policy processes as an integral part of their framework.[2]

Elsewhere, we have developed a normative theory of taxation that makes use of a probabilistic voting framework to incorporate the collective decision process (Winer and Hettich 1998, Hettich and Winer 1999). We refer to this theory as Optimal Representative Taxation (ORT). A brief outline of this approach is presented in the next section, and elements of the theory are

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1. The quote is from Gillis (1989, 515). Bird also draws attention to the "chasm" that exists between optimal tax theorists and practitioners (1991, 38). Harberger (1990) suggests simplified policy rules based on packages of complementary or substitute goods. For a review of the issues concerning uniformity versus selectivity in commodity taxation, see Stern (1990).

2. The best-known example where the political environment is acknowledged without being integrated into the analysis is found in the Meade Report (1978, 44). Ahmad and Stern (1991, 69) and Stern (1990, 105) also make reference to the possible influence of interest groups once optimal tax provisions have been established.

described more formally in an Appendix. The essential point in the present context is that ORT is concerned with the relationship between political institutions and the normative character of tax policies that emerge in an economic equilibrium that includes political as well as economic forces.

In this paper, we focus on possible solutions to the information problem in such a collective choice setting. As we discuss at greater length below, the information requirements facing political parties and policy makers are even greater than those confronted by an OT planner. We argue that the answer lies in decentralized information gathering and policy processes rather than in the development of simplified guidelines for improving the decisions of central planners, a lesson that may also apply to optimal tax analysis. The paper extends the ORT framework to examine the effects of decentralizing policy choices, and uses the analysis to discuss the influence of differences in constitutional structure on the adoption of informational strategies and to review the nature of tax reform.

2. From OT to ORT

Recent developments in the literature on the probabilistic voting model provide a basis for explicitly incorporating collective choice into a normative theory that may be called Optimal Representative Taxation (ORT) [3]. In this framework, the political equilibrium resulting from competition between parties is studied jointly with the equality of supply and demand in private markets.

The probabilistic voting model assumes that political institutions allow for regular elections and free entry of new political parties. Voters choose between parties strictly on the basis of how proposed policies will affect their economic well-being. Continual pressure from the opposition forces each party

3. For the theory of probabilistic voting models, see for example Enelow and Hinich (1984) and Coughlin (1992).

to adopt a fiscal platform designed to maximize its total expected plurality or expected vote in the next election. Since their only aim is reelection, parties use all available policy instruments to pursue this goal, and there will be political as well as economic trade-offs in the use of policy instruments.

As the name of the model suggests, parties do not know with certainty how voters will cast their ballots. (Of course, political parties will try to limit uncertainty by taking polls and consulting with experts, but complete certainty about voting behavior cannot be achieved since information is costly.) The existence of such uncertainty makes it possible for an equilibrium to exist despite the underlying threat of vote-cycling under majority rule. When voting is strictly deterministic, each voter may 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 become the objects of a bidding war between parties, leading to endless vote-cycling over alternative policy platforms. However, if voting behavior is probabilistic, a change in a policy platform directed at any voter will only lead to a change in the **probability** of support from that voter. As a result, it is no longer possible for a party to construct a platform that will allow it to win an election with certainty no matter what the opposition may propose.

The equilibrium fiscal system in such a framework is the stable outcome of a game between expected vote maximizing parties, with each voter counting to some degree. This must be so - otherwise the vote cycle would re-emerge. However, voters do not have equal influence on outcomes. Parties are sensitive to differences in political behavior, giving greater weight to voters who respond to a given change in their welfare with a greater increase in the probability of political support.

To see how a fiscal system emerges in such a model, assume initially that all voters have the same propensity to alter the probability that they will support the incumbent government when they are promised a policy outcome more favorable to them. In this case, the government will try to implement a tax structure that equalizes the marginal loss in economic welfare per unit of revenue across voters. To do so, it will take all of the economic characteristics of voters of which it has knowledge into

account when setting tax rates.

Unless marginal welfare losses per unit of revenue are equalized for voters with equal political sensitivities, the government can alter the structure of taxation so as to increase its overall expected support. Imagine an electorate composed of just two voters, with the first one having a lower marginal loss in welfare per unit of revenue than the second one. If the government raises another dollar from the first voter, it reduces his or her welfare and hence the probability that this person will vote for it in the next election. But such a tax change also allows the government to lower the tax collected from the second voter by one dollar, thereby increasing the probability of support from this voter by a larger amount than the loss in expected support from voter one, while maintaining the same total tax revenue. Competition for electoral support insures that in equilibrium, no such politically profitable policy changes remain to be adopted.

The discussion implies that the equilibrium tax system will be economically efficient. A tax system that equalizes marginal welfare costs per dollar of revenue across voters also minimizes the total economic burden of raising any given level of revenue from the electorate. Underlying this result are the assumptions that voters are well-informed about the consequences of alternative policies and vote instrumentally - that is, solely on the basis of how tax and other policies affect their economic welfare - and that political competition leaves parties no room to cater to the ideological or other tastes of their leaders.

Allowing for differences in the sensitivity of voting probabilities to changes in the level of individual welfare will alter the pattern of taxation across voters, but not the efficiency of the resulting equilibrium. It is in the interest of the governing party to reduce the tax rate on voters who are viewed as being particularly sensitive to a change in their welfare, and who are therefore more likely to switch their vote to the opposition, even if such a change in the tax rate increases the overall economic burden of taxation by making marginal welfare losses higher for some voters than for others. This leads to a

different pattern of taxation, where the marginal losses in expected support per dollar of revenue raised, rather than the marginal losses in welfare per unit of revenue, are equalized across voters.

However, even in this case it will not be possible for any party to propose an alternative tax system that reduces the welfare loss from taxation for any voter without increasing it for some other voter, implying that the tax system is Pareto-efficient. If it were possible for some voters to be made better off without harming others, a party proposing such a Pareto-superior tax system could increase its expected level of support relative to that of the opposition. Again, political competition insures that no such economically and politically superior policies remain to be adopted.

So far we have considered only the pattern of taxation. The provision of public services may also be incorporated into the model. For convenience, let us assume that there is only one public good. In political equilibrium, the level of the public good and the structure of the tax system will be jointly adjusted until the gain in expected votes from spending another dollar on the public good is equal to the (absolute value of the) marginal loss in support from raising the additional dollar.[4] Only then will the total expected support from raising tax revenue and providing the public good be maximized.

In the simple ORT model outlined above, underlying political and legal institutions (which are largely implicit in the framework) are responsible for maintaining political competition. Together with the instrumental nature of voting behavior, such competition forces parties to propose and implement policies that are consistent with efficiency in the allocation of resources. A similar concern with the relationship between institutions and the social allocation of resources underlies the

4. We have not considered the role of administration costs in the determination of the equilibrium tax system. Such costs enter the framework as a wedge between the collection of tax revenues and the provision of public services, and affect the loss in support associated with raising a given net amount of revenue (net of administration costs) from the various tax sources. For extensive discussion of the role played by administration costs in determining the nature of an equilibrium tax structure, see Hettich and Winer (1999).

first theorem of welfare economics, which relates competitive market structure to the normative character (i.e. the Pareto-efficiency) of market equilibrium. Because of its emphasis on the implications of political competition for equilibrium policy outcomes, ORT is fundamentally different in nature from OT, which focuses on choices of policies by a central planner that are compatible with an exogenously specified social norm.

3. ORT and the Information Problem

Incorporation of a competitive political process into the analysis of equilibrium fiscal systems does not resolve the information problem associated with the design of tax policy already noted in connection with OT. As pointed out in the introduction, information requirements for an OT planner are very large. To develop a comprehensive blueprint of the tax system, he or she needs knowledge of the social welfare function, as well as data on preferences, endowments and technology for all participants and sectors in the economy. If we restrict the analysis to commodity taxation, the primary need is for information on demand functions and commodity characteristics. Stern (1987) has discussed the conceptual problems involved in the generation of such data:

> The derivation of the appropriate set of commodity taxes requires information concerning patterns of complements and substitutes that is very difficult to extract from the data. Our attempts to extract it will require specifications of functional forms, which, as we saw, may have a profound effect on the recommendations. As Deaton ... observes: 'In consequence, it is likely that empirically calculated tax rates, based on econometric estimates of parameters, will be determined in structure, not by the measurements actually made, but by arbitrary, untested (and even unconscious) hypotheses chosen by the econometrician for practical convenience' (1987, 51).

One should recognize that similar difficulties would also arise in an ORT context. If party strategists were instructed to calculate tax rates that maximize expected political support, they would also require information on preferences, endowments and technology.

There is a major difference in information requirements between the two approaches however, one that is implicit in the description of political equilibrium given above. While an OT planner needs instructions concerning the marginal social worth of each individual, a full solution to the problem of maximizing political support requires knowledge of how changes in the welfare of different voters affect the probability of voting. Only then can the tax system be adjusted correctly to favor those voters who are more likely to offer the party support at the polls. ORT therefore adds information requirements of a political nature that play no part in OT analysis, and that would further increase the costs of reaching a centralized solution to the information problem.

The feasibility of planning in the face of large information requirements is a classic question in the history of economics. The traditional debate was concerned primarily with the choice between centralized planning and the use of markets. Among the most influential ideas in the debate were those advanced by Hayek (1945), who argued strongly that only decentralized markets could solve the immense task of processing the information necessary to reach efficient economic outcomes.

The historical debate points in a rather different direction from the OT literature, where simplified central planning rules have been proposed as primary solutions to the information problem.[5] It suggests that a more effective approach may be to decentralize policy making into separate, semi-independent areas, while mobilizing special interest groups to provide valuable information as part of their attempts to influence policy outcomes. (One may note that the most commonly used OT formulation subsumes a segmentation or decentralization of policy by separating

5. For an interesting review of this debate, see Simon (1981, chp. 2).

taxation from expenditures, although authors do not generally justify this assumption by making reference to the information question.)

The study of policy making in modern societies indicates that decentralization of policy areas is a common feature of democratic government. While the apparent lack of coordination that may result is often decried by economic analysts, this lack may in fact represent a rational response to information problems associated with complex policy choices.

Decentralization is a well-known aspect of budgetary policy in many countries. In the United States and Canada, for example, decisions on taxation and expenditures are taken separately at the political level, and implemented by different administrative bodies, while special procedures, such as annual budget resolutions or cabinet directives, are used to maintain broad overall coordination. As far as taxation is concerned, further segmentation of policy making and administrative organization tends to occur in accordance with particular fiscal instruments or major tax bases. Moreover, tax commissions and tax reform are usually directed at selected parts of the revenue structure. To fully understand the nature of an ORT equilibrium in the presence of information costs, it is necessary to define and examine the benefits and costs associated with such segmentation, and to relate them to the provision and processing of economic and political information necessary for electorally effective policy.

4. Decentralization, Information and Co-ordination

In this section we extend the framework introduced above in order to examine decentralization as a method of coping with the planning problem facing political parties in a competitive political system.[6] In setting up the analysis, we shall make use of two polar tax systems:

6. A decentralized tax policy process can also be described as a piecemeal policy process. An interesting, early discussion of the advantages of piecemeal policy making in the tax field is provided by Bird (1970, 455-457). Bird also remarks on the obvious connection between piecemeal policy

one chosen in a world where information and co-ordination is costless, and one where co-ordination among decision makers is so costly that no co-ordination among them is attempted. As will be shown in Section 5, the ORT system defined in the presence of information costs, which is an appropriate standard of reference for a representative democracy, lies somewhere between these two solutions. A more formal presentation of the arguments in this and the next section is provided in the Appendix.

To simplify the following discussion of tax policy making, we do not allow for the principal-agent problems that often arise when the policy process disperses decision making power within the bureaucracy. We assume that all decision makers, whether in the governing party or the public service, pursue the same objective, namely maximization of expected votes in the next election.

For convenience, let us think of the fiscal system as consisting of a set of proportional tax rates on well-defined tax bases and one public good. Under the threat posed by the opposition, the governing party adjusts each tax rate and the size of public expenditures until the marginal loss in expected support of increasing any rate per dollar of additional revenue just equals the marginal gain in support from spending another dollar on the public good. As previously argued, achievement of this equality is necessary; otherwise the opposition could propose an alternative combination of tax rates and public spending that would yield a higher level of expected support.

Define the marginal political cost, or MPC, of a small increase in a given tax rate as the (absolute value of the) loss in expected electoral support from taxing the affected base more heavily, and let the increase in tax revenue that results from the higher rate be $\triangle T$. If MPB represents the marginal political benefit, or gain in expected support, from spending another dollar on the public good, the fiscal equilibrium described earlier may then be represented as the choice of tax rates and the level of public expenditure such that, for each tax rate,

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making and Lindblom's (1969) argument for incrementalism in policy making.

$$MPC / \triangle T = MPB, \quad (1)$$

or

$$MPC = MPB \times [\triangle T]. \quad (2)$$

Condition (2) states that in a political equilibrium, every party adjusts tax rates and the level of public spending so that the loss in expected support from a small increase in any tax rate is just equal to the gain in support from spending the resulting increase in revenue on the public good.

In order to study information and coordination problems in this setting, it is useful to decompose the right and left sides of condition (2) in the following manner. Concerning the left side, we may think of a change in any particular tax rate as having three distinct effects on expected electoral support: (i) an impact effect, reflecting mainly the distributional consequences for voters of a change in the rate, while holding the level of all economic activities constant, (ii) a direct effect that results from the consequences of economic adjustments (normally a decline) in the level of economic activity on which the tax is levied, and (iii) an indirect or general equilibrium effect that reflects the consequences of substitution towards tax bases and activities not directly subject to the rate increase. Here and below, we are assuming that it is possible to distinguish impacts of a short-run and mainly distributional nature from the longer-run effects of taxation that result in substantial induced changes in private economic behavior

Concerning the right side of (2), we may decompose the change in tax revenue following a small increase in the tax rate into two parts: a direct effect on tax revenue that follows when all taxable activities other than the immediately affected tax base are held constant, and an indirect or general equilibrium effect that takes account of the implications for total revenues caused by substitutions away from the activity that is more highly taxed.

Using these decompositions, condition (2) can be re-written as follows[7]:

MPC = [Impact effect on support + Direct Effect on support + Indirect effect on support]

= MPB x [Direct effect on tax revenue + Indirect effect on tax revenue]. (3)

where the second term in square brackets on the right side of (3) is the term [$\triangle$T] in equation (2).

The decomposition in (3) is helpful in understanding the implications of decentralizing the decision process. Consider a finance ministry or budget office choosing a set of tax rates along with an appropriate level of public services. In a world where information and coordination problems are absent, all the effects represented in the decomposition will be fully taken into account by tax officials, including the indirect or general equilibrium terms. In a world where such costs are considerable, however, institutional arrangements will arise within the ministry that lead to complete or partial neglect of some of the effects.

To analyze these cases further, we introduce a situation where each tax rate and the corresponding tax base are the responsibility of a separate group of decision makers within the ministry who can determine only this single rate. Each group of policy makers is assumed to be fully informed about the impact and direct effects of a change in their rate, but it has no information concerning the indirect or general equilibrium effects caused by the tax instrument under its control.[8] This set-up represents a situation where decentralization of the policy making process allows specialization in information acquisition, while at the same time creating a problem of coordinating semi-autonomous policy makers.

In the following section we develop a diagrammatic analysis that contrasts the choice of tax rate in a world where information and coordination costs are absent, with the choice in one where

7. A mathematical derivation of condition (3) is provided in the Appendix.

such costs are so high that no co-ordination among policy makers is attempted. These two boundary cases allow us to determine a range into which an efficient choice of tax rates must fall. The graphic analysis relates the efficient choice to the decomposition in condition (3) discussed earlier, and sets the stage for an examination of how actual institutions affect the nature of possible solutions to the information and coordination problems in tax policy making.

5. A Graphical Analysis

A full or perfect solution to the problem of designing an equilibrium political strategy requires that all of the terms in equilibrium condition (3) for each tax rate be known. This will be possible only if information costs about the impact, direct and indirect effects of taxation as well as the costs of coordinating policy makers are negligible. Such a solution for the rate of tax on the kth tax base is represented in Figure 1 by t_k*.

[Figure 1 here]

In the figure, the upward sloping line "MPC" represents the left side of condition (3), and shows how the marginal loss in expected support that results from a small increase in t_k increases with the level of the tax rate. The right side of (3) is represented by the downward sloping line "MPB x [Change in Tax Revenue]". This line shows how the increase in expected support that results from spending the additional revenue (produced by a small increase in t_k) declines with the level of the tax rate. The intersection of the two lines yields the equilibrium rate for the kth tax base when information and co-ordination costs are negligible, t_k*.

At the other extreme to a world of costless information and co-ordination is a situation where each instrument is assigned to a separate group of decision makers with the additional instruction that no co-ordination between decision makers to take the indirect terms in (3) into account is to be

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8. Each tax rate could also be thought of as a set of closely related tax instruments.

attempted. This reflects a world where the costs of acquiring information about the indirect effects in (3) are prohibitive, or where co-ordination costs are so high that using any information about them does not increase net support. Each decision maker takes into account only the distributional and direct incentive effects associated with his or her own tax instrument, and ignores the implications for support that follows from the effects of his decision on the tax bases assigned to other decision makers.

In terms of Figure 1, rate t_k is then set according to condition (3) with the indirect terms on the right and left sides set to zero. The tax rate that results depends on the sign and size of the terms that are ignored in the setting of tax policy. Figure 1 is drawn on the assumptions that the indirect effect on support of raising any tax rate on balance adds to the loss created by the impact and direct effects, and that the indirect effect on revenue of raising the kth tax rate on balance adds to total revenue. In this situation, the line representing the marginal political cost from raising the kth rate, and that representing the marginal political support from spending the additional revenue, both lie below the corresponding lines when all terms in condition (3) are taken into account, and the equilibrium rate that results is shown in the figure by t_k'.

It can be seen from Figure 1 that complete decentralization without co-ordination leads to a net loss of support equal to the triangle abc.[9] This net loss can be decomposed into the difference between the loss in support from raising the kth rate from t_k^* to t_k', equal to area $t_k^* abt_k'$, and a gain from spending the extra revenue, area $t_k^* act_k'$. Note that even though t_k' is chosen assuming the indirect effects are zero (or completely ignored), the full increase in support from using the revenue generated still occurs.

Neither t_k^* nor t_k' is politically or economically efficient. The first solution presupposes that

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9. It should be noted that the triangle is a partial equilibrium representation of the loss in support.

information and co-ordination are costless, while the second would be optimal only if there are no benefits to co-ordination across decision makers. The best feasible solution involves trading off the benefits from decentralizing decision making, including the gains in support from being able to economize on the costs of acquiring and processing information, with the costs of doing so. These costs include the loss in support that occurs because of the added difficulties associated with co-ordinating semi-autonomous decision makers. The politically optimal rate for the representative tax base thus lies somewhere between the two rates shown in Figure 1. The arguments concerning the effects of political competition when voters are informed and parties have no room to satisfy the ideological tastes of party activists suggests that this intermediate rate will also be Pareto-efficient.

Characterization of the structure of this ORT tax system, and investigation of the relationship between this structure and the equilibrium system that results under various institutional arrangements remains to be accomplished. In the next two sections, we contribute modestly to these tasks. We consider how differences in specific political institutions may be related to the problems of acquiring information and co-ordinating policy makers, and thus to the nature of observed tax systems. We also consider the meaning and nature of tax reform in a world in which information and co-ordination problems are of paramount importance.

6. Tax Policy Making in Congressional and Parliamentary Political Systems

Decentralization of decision making must be implemented through institutions. Unfortunately, not much is known about how existing political institutions contribute to the solution of the information and coordination problems discussed previously. It is reasonable to suspect, however, that different institutional arrangements give different results.

While we cannot provide a full normative theory of institutional design in this paper, we can consider the functioning of two important existing institutions in relation to the information and

coordination problems. We discuss differences in the nature of policy processes in congressional and parliamentary systems, and relate the discussion to elements of the theory underlying Figure 1.[10] Although such an analysis is only a preliminary step toward the design of more efficient institutions, it is nevertheless important since such institutions must function in an actual political setting.[11]

The tax policy process in the congressional system, as described for example by Breton (1991) and Pechman (1987, chp.3), is one in which the executive as well as legislators from both the House and Senate are directly involved in lengthy negotiations on tax proposals that are well known to all participants. The negotiations required to fashion the compromises that are finally passed into law often center on the work of standing tax committees in both branches of Congress that have the power to initiate and to block tax legislation. The possibility of exerting meaningful influence at several points in the process such as in the tax writing committees draws representations by lobbyists on behalf of various special interest groups. The large number of legislators and interest groups involved and the intensity of the resulting negotiations makes the process of passing tax legislation, in Pechman's words "a grueling experience, demanding physical stamina as well as analytical and political acumen" (p. 62).

The policy process in the Canadian parliamentary system, described by Breton (1991) and in Hartle (1982), differs radically from that in the United States. The most important phase of the tax policy process occurs within the federal bureaucracy, especially the Department of Finance, and is usually conducted in secret.[12] Ministers heading other departments and even the Prime Minister

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10. Breton (1991) provides an interesting comparison of the structure of decision making in parliamentary and congressional systems, as well as a review of literature on this topic.

11. Douglas Hartle contributed substantially to this task over the course of his career. See, for example, Hartle (1982,1988).

12. Occasionally a 'White Paper' may be issued that sets out a proposed reform for general discussion, but this is an infrequent occurrence.

normally exercise only minor influence. The secrecy of the tax policy process and especially the fact that most tax legislation is fashioned behind the closed doors of a non-partisan bureau makes it difficult for ordinary members of parliament and representatives of interest groups to exert a direct influence on tax legislation as it is being drawn up. Influence may of course be exerted indirectly in the normal course of political debate. But on the whole, the tax policy process in the Canadian parliamentary system seems substantially more impervious to representations by legislators and lobbyists than that in the congressional system.

Although the representation of special interests is more muted and indirect in the parliamentary system, control over the revenue implications of tax legislation is much more direct. The doctrines of cabinet solidarity and budget secrecy, as well as the strong support for the Minister of Finance traditionally accorded by the Prime Minister give this Minister substantial control over the expenditure and tax policy processes. All tax policy proposals must pass through the hands of the Minister of Finance and his or her senior officials. The Minister can ask for changes in the proposals put forward by specific branches of the Department of Finance if the aggregate revenue implications of proposed legislation are inconsistent with overall expenditure targets. Moreover, and most importantly, the Minister can ask for changes in particular aspects of the tax code without rejecting a package of reforms as a whole, so that the cost of co-ordinating amendments to proposals put forward by officials is substantially lower. In the U.S. system, the President can also reject specific tax reform proposals, but only by vetoing the entire package. As Breton (1991, 34) point out, this is a crude instrument compared to the power of the Minister of Finance, and can be used only sparingly because of the difficulties it creates for the President in the future when the support of members of Congress on other matters is required.

Translated into the present framework, the preceding sketch of policy processes suggests that the costs of information about the nature of the indirect or general equilibrium effect on the left side

of condition (3) are smaller in the U.S. congressional system, while the costs of co-ordination required to take the indirect revenue effect on the right side of (3) into account are lower in the Canadian parliamentary system. In the U.S., interest groups have a greater incentive to supply information to the executive and to legislators concerning the consequences for political support of proposed tax changes, while in the parliamentary system, the costs of co-ordinating the aggregate revenue implications of different tax proposals appear to be lower. So too would be the co-ordination costs of taking into account the indirect implications for support of various tax proposals, **if the Minister knew them**. But in the parliamentary system, the role of special interests in the tax policy process is muted, in comparison to the U.S. system, and hence less information is supplied in the normal course of events.

Figure 2 illustrates the consequences of the argument for the equilibrium fiscal system. To allow the congressional system to be represented diagrammatically, we set the indirect revenue effect of any change in a tax rate on the right side of condition (3) to zero, indicating that it is not taken into account because of the nature of the political system in which tax policy is made. To represent the parliamentary system, we set the indirect effect on support of a change in any tax rate on the left side of (3) to zero.

[Figure 2 here]

How does the resulting rate in the congressional system compare to that in the parliamentary one? That depends on the sign and size of the indirect or general equilibrium effects in (3). The same assumptions as made previously about these effects imply that the tax rate in the congressional system is $t_k^{\mathbf{C}}$, while in the parliamentary system it is $t_k^{\mathbf{P}}$. It can then be seen from the figure that there is a tendency for tax rates in the congressional system to be too small relative to full information, support-maximizing rates, while the opposite result holds for the parliamentary system. The intuition here is that interest group politics in the congressional system supplies information about opposition

to tax proposals more cheaply than in a parliamentary system, and that the costs of co-ordinating proposals to realize the full revenue implications of any tax proposal are relatively lower in the parliamentary system. It appears, therefore, that the basic nature of political institutions substantially shapes tax policy outcomes, and, given our assumptions about the signs of the indirect effects, that the congressional system has a tendency to produce lower equilibrium tax rates than the parliamentary system.

It is interesting to note that both outcomes $t_k^{\mathbf{C}}$ and $t_k^{\mathbf{P}}$ may be inferior to one chosen without any attempt to take the indirect effects into account. Using information about just one of these general equilibrium terms may lead to an outcome that departs to a greater extent from the full-information solution than if decision making is completely decentralized and co-ordination among tax departments is not attempted. We should expect, and we do observe, efforts in both political systems to take the indirect effects on both sides of condition (3) into account. In the congressional system, attempts to replicate the direct authority exercised by a Minister of Finance are ongoing and include the Congressional Budget and Impoundment Control Act of 1974 and Gramm-Rudman-Hollings Act of 1985 (McCubbins 1991). In the parliamentary system, the Minister of Finance regularly meets with representatives of various interest groups while the relatively powerless standing committees of the House of Commons hold extensive meetings to hear the views of special interests, the results of which are communicated to the government through party caucus meetings and in various official reports.

Whether these procedures in congressional and parliamentary systems are the best possible means for acquiring information and co-ordinating tax policy that are consistent with the basic character of the respective political systems remains an open question. Providing answers to this questions is a crucial task. In the face of information and co-ordination problems of the sort discussed, the way that tax policy is made may have as substantial and enduring an effect on the

nature of the tax structure that is actually implemented as does advice about tax reform based on rules of thumb such as tax neutrality.

7. Tax Reform

Hayek's (1945) argument for the supremacy of a decentralized price system over centralized planning as an allocation mechanism depends on the fact that the conditions underlying economic decisions are in a constant state of flux. It is impossible, in Hayek's view, for a highly centralized policy process to mimic market responses to constantly changing conditions. A problem similar to that facing the central planner is encountered by political parties and their advisors trying to design ORT systems, and lies behind the reliance by the government on a decentralized policy making process. In the following paragraphs, we consider the concept of "tax reform" in this light.

We shall employ the term tax reform to refer to policy responses concerning specific aspects of taxation by the governing party, as well as to other more comprehensive changes in tax laws that may be needed to re-establish overall policy coordination. This differs from more common usage, which relates reform to the implementation of plans devised by experts on the basis of given normative criteria.

One can distinguish between two types of reform that correspond to two different outside influences. First, we may observe shocks of a limited nature that affect primarily a particular tax instrument or base. Adjustment will be restricted to that instrument, and effects on other areas (the indirect effects in equation (3)) will be ignored. Changes of this nature may conform to what in practice is sometimes called "technical" reform.

Shocks of a broader nature will have an impact on several tax instruments at the same time. Here the need for coordination is greater. Responses may include joint adjustment of two or more policy areas, such as the co-ordinated change of related provisions in the individual and the corporate

income taxes, or adjustment of two or more important aspects of the same major part of the system. Interdependence between the affected areas will be recognized to some extent, although the full value of indirect terms in (3) will not be taken into account in the determination of policy.

As a number of adjustments of a partial nature are made over time in response to different shocks, coordination problems will become more severe. The indirect effects of tax changes will acquire more importance, both because of the build-up of maladjustments and because tax elasticities underlying these effects are generally larger in the long-run than in the short-run. As a result, a need for coordinating reforms will arise in order to rebalance the overall tax system. In this context, the indirect effects of changes in any instrument become crucial to the nature of reform, even though it may have been optimal to disregard them partially or completely for more limited responses and over shorter time horizons.

Co-ordinating reforms may involve changes in primarily one important aspect of the tax system, bringing it into line with what may be presented as 'economic realities', or, less frequently perhaps, it may involve co-ordinated changes in two or more areas of the tax system. In the later case, co-ordinated changes may be separated in time in order to avoid overloading the ability of the government to handle political pressures from a large number of adversely affected taxpayers.

The view of tax change suggested by this analysis implies that reform will be an integral and regular part of public policy, with frequency and scope being affected by outside forces as well as by existing political institutions. The authors have shown elsewhere (Winer and Hettich 1991, 1999) that tax reform happens more often in the parliamentary system of Canada, where transaction costs are lower, than in the congressional system of the United States, where tax policy is subject to much more extensive political negotiation.[13] One would expect this to be true particularly for reforms

13. See also Ashworth and Heyndels (1997).

aiming to re-establish coordination, since transaction costs play an especially important role in this case.[14]

7. Conclusion

While the information requirements of OT are extensive, those of Optimal Representative Taxation are even larger, since the acquisition of knowledge about political margins must be added to tasks facing the OT planner. We argue in this paper that decentralization of policy making is the best solution to the information problem. Such decentralization has two impacts. On the one hand, because of the costs of co-ordinating policy makers, it leads to choices based on a more restricted consideration of policy effects. On the other hand, it makes possible reliance on political and bureaucratic institutions that motivate interest groups and other participants to provide relevant economic and political information as a by-product of rent-seeking behavior, while permitting gains from specialization in the study of particular aspects of taxation to be realized.

Astute politicians and tax advisors are aware of information and co-ordination problems. Nonetheless, much of the formal theory of taxation that tax experts rely upon implicitly assumes costless information and perfect co-ordination. Simplified policy rules, such as tax neutrality, have an important role as a method of coping with information and co-ordination costs. However, it is unlikely that rules of thumb, by themselves, allow governments to design and implement successful tax policies in the face of constantly changing economic and political conditions.

A better understanding of how political institutions allow policy makers to cope with information and co-ordination problems would permit the construction of a better normative theory

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14. Maslove (1989) has observed cycles of tax reform in the Canadian parliamentary system. A complementary view of tax reform is found in Velthoven and van Winden (1991).

of institutions, and, thereby, would provide the basis for the implementation of more efficient tax systems. The analysis of public policy towards private markets has long since moved from a concern with equilibrium prices and quantities to a concern with the institutional arrangements under which private markets operate. As useful as the Carter report was in many ways, and as interesting as subsequent developments in Optimal Tax Theory have been, we suggest that the theory of taxation would be enriched by an analogous transition.

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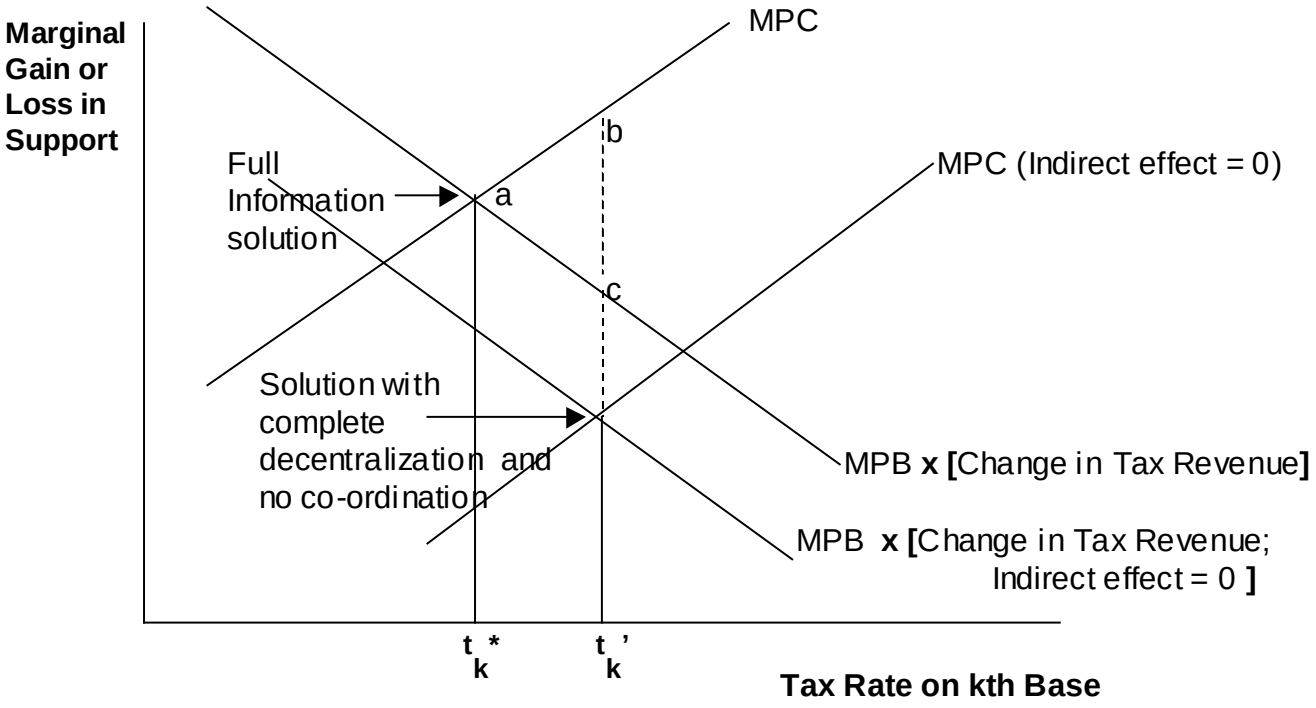
Figure 1

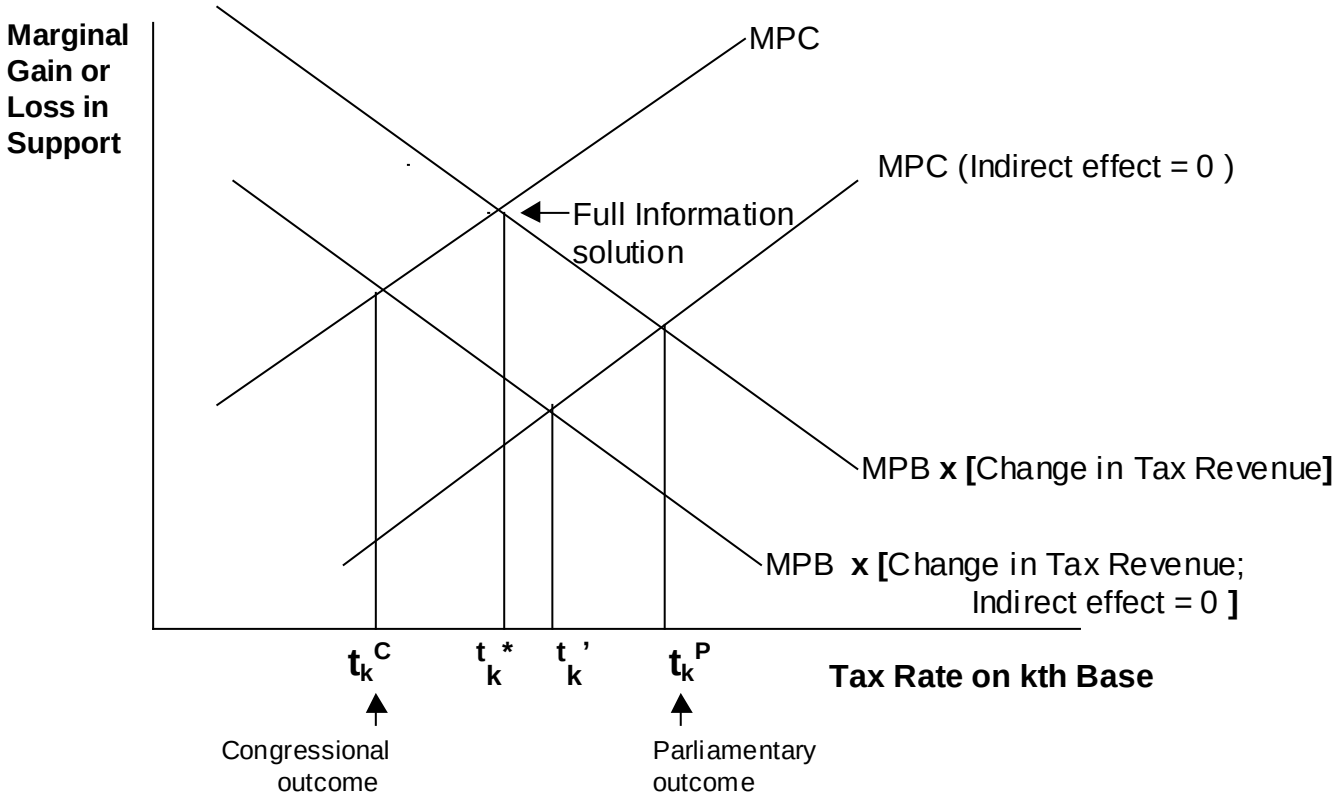
Decentralization and Tax Policy in Political Equilibrium



Note: In equilibrium, for a small increase in the tax rate on a given base,
MPC = MPB x [Change in Tax Revenue],
where:
MPC = [Impact effect on expected political support + Direct effect on support + Indirect effect on support]; and
Change in Tax Revenue = [Direct effect on tax revenue + Indirect effect on tax revenue]

Figure 2

Tax Policy Process in Parliamentary and Congressional Government



Technical Appendix

A. Probabilistic Voting, Political Equilibrium and Economic Efficiency

Assume for convenience that there are only two political parties, an incumbent party or government, and one opposition. (This assumption can be relaxed without affecting the following discussion.) Assume also that the electorate is divided into H interest groups of n_h identical voters. Let the probability of voting for the incumbent (i) by a representative member of group h, as viewed by the party, be a function of the utility differential that results from the fiscal policy platforms offered by the incumbent government and the opposition (o):

$$p_h = f(v_{hi} - v_{ho}) \tag{A1}$$

where v_h refers to an indirect utility function of the representative individual in group h. (Similarly for the probability of voting for the opposition).

We consider a representative democracy in which free entry into the competition for office forces every political party to adopt a fiscal platform that maximizes its total expected vote. Given (A1), the expected vote for the incumbent is

$$EV_i = \sum_h n_h \cdot f(v_{hi} - v_{ho}). \tag{A2}$$

The maximization of EV_i is constrained by a government budget restraint that incorporates the general equilibrium structure of the economy

$$R(t , G) = G \ , \tag{A3}$$

where t is a vector of J tax rates and G is the level of a single public good. Maximization of expected plurality could also be used as a party's objective without altering the argument. Maximization of expected plurality or votes seems a reasonable objective to impute to political parties that are uncertain about who their opposition will be in the next election.

Choice of an optimal fiscal platform for the incumbent requires that each tax rate t_k be

adjusted until the following first order conditions for the maximization of (A2) subject to (A3) are satisfied:

$$\sum_h \; n_h \frac{\partial f}{\partial v_{hi}} \frac{\partial v_{hi}}{\partial t_k} \; - \; \lambda \frac{\partial R}{\partial t_k} \; = \; 0, \quad k \; = \; 1, 2, \quad , J, \tag{A4}$$

where λ is the Lagrange multiplier associated with the budget restraint. An analogous condition describes the optimal choice of the level of the public good, and the fiscal policy choices of the opposition party.

Under appropriate conditions concerning the density functions in (A1), and assuming Nash behavior by political parties in their choice of platforms, equilibrium in the two party electoral game will exist and is unique (see, for example, Coughlin 1992). Existence depends on the continuity of the expected vote functions (A2), a continuity which stems from the probabilistic nature of voting behavior. Uniqueness and convergence of equilibrium policy platforms is assured if the expected vote functions are strictly concave in the policy instruments t and G.

An important feature of the equilibrium described above is that it is consistent with the attainment of Pareto-efficiency. To see that this is so, it is useful to consider the nature of the fiscal system that solves the following problem:

$$\underset{\{t, \, G\}}{Max} \; S \; = \; \sum_h \theta_h \cdot v_h, \tag{A5}$$

subject to (A3),

where the weights $\theta_h = (n_h \cdot \partial f/\partial v_h)$ are evaluated at the Nash equilibrium. (Each θ_h can be thought of as the influence weight implicitly assigned to group h by the political system). If we can show that the fiscal system that solves problem (A5) is identical to the one that solves the first order conditions (A4) evaluated at the equilibrium, then we will have shown that the equilibrium platform maximizes a particular weighted sum of voter utilities, and hence is Pareto-efficient. The general idea here is to

use an artificial planning problem that has a solution with well known properties as a means of studying the characteristics of an equilibrium. The trick is to find such a problem having a solution that replicates the equilibrium in question.

In fact, it is straightforward to see that the first order conditions for a solution to (A5) are identical to those in (A4). Intuitively, the reason is that unless the "political support" function S is maximized, it would be possible for some party to increase its expected vote by making some voters better off (especially those whose influence weights are relatively large) without making any others worse off. Competition in the struggle for office ensures that no such opportunities remain in equilibrium.

It should be noted that even though the support function in (A5) is a weighted sum of utilities, it is not a social welfare function that is being maximized by a social planner or tax theorist. In the present framework, the form of the support function and the weights attached to each voter's utility are determined by assumptions about the nature of voting behavior and the objectives pursued by the parties, and the solution to the synthetic optimization problem is simply a useful way of characterizing the equilibrium policy platform.

B: Modeling Information and Co-ordination Problems

In order to consider information and co-ordination problems in the framework outlined above, several simplifying assumptions are helpful. First, in order to concentrate on issues of information and co-ordination, we ignore principal-agent problems that often arise when the policy process disperses decision making power. Second, we assume that the level of G cannot be chosen with a view to influencing the level of taxable activities. Thus tax bases, however defined, are independent of the level of public services G. Third, we assume that it is possible to distinguish short-run, mainly distributional, impacts of changes in tax policy from longer run effects that involve

substantial induced changes in private behavior. effects on support of induced changes in taxable activities. Finally, we assume for purposes of the following discussion that the definition, though not the level, of each tax base is exogenous and that all tax rates are proportional. (In a completely general model, the formation of tax bases and the nature of other tax instruments would all be endogenous, as in Hettich and Winer, 1999)

Together these simplifications allow the support function S in (A5) to be re-written as

$$S = S(t, B(t), G), \tag{A6}$$

where $t = (t_1, t_2,..., t_J)$ is a vector of proportional tax rates and $B = B\{B_1(t), B_2(t),..., B(t_J)\}$ is a vector of the corresponding tax bases, and where the possibility that each tax rate may affect a large number of tax bases is explicitly acknowledged. Reformulating the arguments of the support function in this manner allows a distinction to be made between the effect on political support of a change in each tax instrument holding constant the level of taxable economic activities, and the effect on support that depends on the interrelatedness of economic and political activities.

In view of the preceding assumptions, the planning problem that may be used to replicate the political equilibrium can be restated as:

$$\max_{\{t,G\}} \; S(t, B(t), G) \tag{A7}$$

subject to

$$\sum_j t_j \cdot B_j = G. \tag{A8}$$

The first order condition for tax rate t_k in the above problem is:

$$-\{ \frac{\partial S}{\partial t_k}\Big|_B + \frac{\partial S}{\partial B_k} \cdot \frac{\partial B_k}{\partial t_k} + C \} = \lambda_k = \lambda \cdot \{ B_k (1 + \varepsilon_k) + D \} \tag{A9}$$

where

$$C = \sum_{j \neq k} \frac{\partial S}{\partial B_j} \cdot \frac{\partial B_j}{\partial t_k}, \tag{A10}$$

$$D = \sum_{j \neq k} t_j \cdot \frac{\partial B_j}{\partial t_k} , \qquad \text{(A11)}$$

and where λ is the Lagrange multiplier associated with the government budget restraint, $\varepsilon_k = \partial B_k / \partial t_k \cdot t_k / b_k$ is the elasticity of base B_k with respect to tax rate t_k, and λ_k represents the gain in support from raising rate t_k and spending the resulting revenue on public services. An analogous condition holds for the other tax rates and for the level of public services. Equation (A9) is equivalent to condition (3) in the main text.

The C and D terms in (A10) and (A11) represent general equilibrium interdependencies between the choice of rate t_k and the choice of other rates that occur because of the inter-relatedness of economic and political activities. (Interdependencies that arise because of political structure are not clearly represented in equation A9 however.) These terms, which are referred to in the text as the indirect or general equilibrium effects in condition (3), can be expected to be smaller in the short-run than over longer horizons because tax elasticities tend to grow with time.

The problem of co-ordinating tax policy makers may now be introduced into the amended framework by thinking of each tax rate in the support function as being under the control of a separate group of decision makers who know everything about the impact and direct effects of their 'own' instrument. The problem of coordinating decision makers so that the indirect or general equilibrium effects of separate policy choices - the C and D terms in (A9) - are taken into account is of central concern in the paper. In a more general framework, use would be made of the near-decomposability (in the sense of Simon 1981, chp.7) of the economy and political system into semi-independent segments to group taxable activities into bases that are largely independent, so as to economize on the need for co-ordination in tax policy making. Decentralization of economic policy-making along these lines has also been advocated by Tinbergen (1954) among others

For purposes of illustrating condition (A9) graphically in Figures 1 and 2, we assume that all

the terms on the left side are negative. The intuition here is that an increase in the kth rate will cause a loss in support for three reasons: (i) the impact effect on support of a small increase in the kth rate, the first term on the left side of (A9), will be negative; (ii) there will be a further loss of support because of the direct, negative effect of the kth rate on the size of the kth base, hence the second term on the left side of (A9) is also assumed to be negative; and (iii) the cross effects of t_k on other bases B_j will, on balance, lead to yet further losses in support, represented by $C < 0$. Each of these three terms is assumed to decrease (algebraically) with t_k, and all of these assumptions are embodied in the positively sloped curve in Figures 1 and 2 referred to as the marginal political cost or MPC of raising the kth tax rate.

We also assume that the terms on the right side of (A9) are positive: (i) as usual we assume that increasing the level of public services generates additional support, hence $\lambda > 0$; (ii) it is reasonable to expect that as the kth rate increases, revenue from the kth base does as well so that $B_k(1 + \varepsilon_k) > 0$; and (iii) we assume that on balance the substitutions away from the kth taxable activity as t_k increases lead to additional revenues, represented by $D > 0$. Furthermore, these three terms are assumed to decline with the kth rate. In Figures 1 and 2, these assumptions are used in drawing the negatively sloped line representing the marginal political benefit or MPB of another dollar of public expenditure, multiplied by the change in tax revenue that results from a small change in the tax rate.

In a decentralized policy making process, a full solution to the set of first order conditions of which (A9) is a part is feasible only if information and co-ordination costs, especially those that arise in connection with the indirect or general equilibrium terms C and D, are negligible. Such a full information solution is represented in Figures 1 and 2 by t_k^*. The tax rate that emerges when no co-ordination among policy makers is attempted is found by solving (A9) with C and D set equal to zero. This rate is shown in the figures as t_k'.