Hidden Taxes and Representative Government: The Political Economy of the Ramsey Rule

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A social planner finances a public good by taxing the consumption of two private goods. If leisure cannot be taxed, the tax burden is minimized by setting the tax rates on the two goods inversely proportional to their price elasticities of demand (Ramsey rule). The authors replace the social planner with an elected policy maker who cares not only about minimizing the tax burden but also about getting reelected. Electoral competition creates incentives for the incumbent to deviate from the Ramsey rule: He or she decreases the tax rate that is relatively visible and increases the tax rate that is relatively hidden.

HIDDEN TAXES AND REPRESENTATIVE GOVERNMENT: THE POLITICAL ECONOMY OF THE RAMSEY RULE

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1. INTRODUCTION

The theory of optimal taxation assumes the position of a social planner seeking to balance efficiency and equity concerns to derive normative prescriptions about the socially desirable tax structure (Atkinson and Stiglitz 1980, chap. 11-14). The tax systems observed in practice diverge from this theoretical benchmark. Social scientists have long sought to identify deficiencies of political processes and institutions that cause inefficient and inequitable taxes.

Conventional wisdom attributes tax distortions to special interest pressures (Olson 1965). Compared to the social welfare function maximized by the benevolent planner of optimal tax theory, the objective functions and constraint sets of elected policy makers are shaped by political selection pressures. If political candidates whose tax preferences are close to the tax preferences of special interests are more likely to survive competitive political races, the survivors will assign
higher weight to the welfare of special interests. Moreover, whereas
the social planner’s constraint set contains only the behavioral re-
 sponses of economic agents (the disincentive effects of taxation), pol-
 icy makers who are motivated by reelection concerns must also be re-
 sponsive to political constraints. Thus, they may offer favorable tax
 legislation to special interests in exchange for campaign contributions
 or other forms of political support.

 Over the years, this wisdom has been theoretically refined by two
 schools of political economy. The “Chicago school” accepts the idea
 that politically motivated redistribution occurs, but it disputes the no-
 tion that redistribution will take inefficient form (Stigler 1971; Becker
 1983; Wittman 1989). After all, policy makers who use inefficient tax
 instruments could increase their political support by switching to a
 more efficient tax policy. In a competitive political environment, pol-
 icy makers who fail to act efficiently are unlikely to survive for long.
 Thus, political competition creates decision and selection pressures
 for elected policy makers to use the most efficient transfer mechanism
 possible. With this interpretation, the notion that the observed tax
 structure is inefficient is necessarily based on an incomplete analysis
 of the incentive constraints faced by elected policy makers and of the
 selection pressures working on them. The intellectual challenge, then,
 is to identify additional economic or political constraints that would
 “rationalize” the observed tax structure as efficient (cf. Coate and
 Morris 1995, 1211).

 In contrast to the Chicago school, the “Virginia school” takes an in-
 tegrated approach to the analysis of redistributive taxes and tax disor-
 tions, building on the idea that “public misunderstanding of the actual
 situation is almost a logical necessity for the average rent-seeking ac-
 tivity” (Tullock 1989, 20).

 Electoral competition forces reelection-motivated policy makers to
 use disguised transfer mechanisms so as to hide the fact that they are
 favoring special interests at the expense of the large mass of voters to
 whom they are politically accountable. Thus, policy makers employ
 inefficient tax instruments because they are opaque (Tullock 1983,
 chap. 3; cf. Arnold 1990).

 Coate and Morris (1995) provided a rigorous theoretical underpin-
 ning for Tullock’s (1983) informal claim. In their model, policy mak-
ers must choose between an efficient cash transfer to a special interest and a potentially inefficient public project that benefits the special interest. There are two types of policy makers: a good type who cares about the welfare of the representative voter and a bad type who cares about the welfare of the special interest. Voters cannot directly observe whether the public project is inefficient, nor do they know the policy makers’ type. Policy makers who start out with a strong reputation for being the good type but are in fact the bad type would reveal their type if they made cash transfers to the special interest; to avoid losing office, they transfer wealth to the special interest by choosing the public project even when it is inefficient. The policy makers thereby partially hide their type because the good type also chooses the public project on occasion—namely, when it is efficient. Because the voters cannot observe whether the public project is efficient, they cannot perfectly disentangle the cases when the good type chooses an efficient public project and the bad type chooses an inefficient public project.

We do not dispute the notion that powerful special interests skew existing tax systems to their advantage, with inequities and inefficiencies going hand in hand because of informational constraints, along the lines suggested by Coate and Morris (1995). We do argue, however, that the tax distortions created by special interest pressures are merely a higher order expression of a more fundamental problem. It is not the existence of special interests but electoral competition itself that creates incentives for office-motivated politicians to distort the tax system, decreasing visible taxes and increasing hidden taxes. What distinguishes special interests from the general public is simply that they are better informed about taxes (or tax breaks) of special interest to them. Office-motivated politicians then have incentives to reduce taxes that are visible to special interests at the expense of raising taxes that are hidden to the general public (cf. Lohmann 1998). But the tax-distorting effect of electoral competition does not hinge on the assumption that taxes have distributional effects about which voters are differentially well informed. Even if the electorate consisted of a single representative voter, office-motivated politicians would choose to decrease visible taxes and increase hidden taxes—at the price of increasing the tax burden. This is the claim we explore and prove in our article.
We develop our argument in the context of the Ramsey (1927) model. Ramsey himself sought to demolish another conventional wisdom asserting that commodity tax rates should be equal across goods. To this end, he set up an artificial world in which a social planner must finance a public good by taxing the consumption of two private goods consumed by a representative agent. If the agent’s leisure cannot be taxed, the Ramsey rule requires the tax rates on the two goods to be set inversely proportional to their price elasticities of demand. This rule minimizes the deadweight loss of taxation.

We add three assumptions to the Ramsey model. First, we replace the social planner with an elected policy maker who cares not only about doing good (minimizing the tax burden) but also about getting reelected. Second, we assume that political candidates differ in some quality that influences their performance in office (how efficiently they provide the public good or, equivalently, how much tax revenue they must raise to provide the public good). Third, we assume that voters cannot directly observe the incumbents’ quality; instead, they take informational cues from the incumbents’ performance in office (how much they are taxed).

We find that voters, in forming an inference about the incumbents’ efficiency based on observed taxes, rationally place higher weight on visible taxes and lower weight on hidden taxes. The incumbents then further their reelection prospects if they deviate from the Ramsey rule, decreasing visible taxes and increasing hidden taxes, with the effect of presenting themselves to voters as efficient providers of the public good.

In a related model from Rogoff and Sibert (1988), a government seeking to demonstrate competence and enhance its reelection prospects relies excessively on the seigniorage tax, which is very imperfectly observed, and sets the more visible income tax suboptimally low. Rogoff (1990) suggested that government spending is biased toward immediately observable consumption and against government investment, whose full impact becomes apparent only after the election.

These models assume that the government knows its own competence, but its voters do not. Indeed, Rogoff and Sibert (1988, 4) suggested that the assumption of asymmetric information is critical: “It
would be pointless for the incumbent party to try to deceive the public unless it has an information advantage.”

As a consequence of the asymmetric information assumption (which also underlies Coate and Morris’s [1995] analysis), these models are preoccupied with deriving the conditions under which pooling, separating, or partially pooling and separating equilibria arise; that is, they examine whether a competent government will set policy so as to distinguish itself from incompetent types. An incompetent government will mimic the behavior of competent types, or competent and incompetent types will behave identically in some states of the world and differently in others.

We assume, to the contrary, that policy makers and voters are symmetrically (ill) informed. In our model, incumbents are uncertain about their quality at the time of setting policy. This assumption allows us to isolate the tax distortions that arise because incumbents seek to pretend that their quality is higher than it truly is; we thereby avoid confounding policy effects that arise when incumbents know their own quality but the voters do not. By excluding asymmetric information, we demonstrate that tax distortions arise because of the strategic interaction between incumbents and their voters and not because of the strategic interaction between different types of incumbents. The tax distortions are driven by incumbents’ desire to make voters believe that they are of above-average quality, independent of their actual quality, and not by their desire to separate themselves from lower quality types or mimic the behavior of higher quality types. As suggested by Coate and Morris (1995, 1231), the key to understanding why elected policy makers follow distortionary policies lies with “politician uncertainty” along with politicians’ concern about protecting their reputations, but the asymmetric information assumption of our predecessor models turns out not to be critical.

Our symmetric information assumption comes with another feature to recommend it: an interpretation of “candidate quality” that is particularly attractive in the context of tax policy. We can think of both candidates and voters as being imperfectly informed about the fit between the candidates’ known “ideologies” defining the mapping of tax rates into tax revenues and tax burdens, on the one hand, and the unknown response elasticities of economic agents defining the true map-
ping, on the other (Piketty 1995; cf. Harrington 1993 and Roemer 1994). With this interpretation, candidate quality stands for the objective accuracy of a candidate’s ideology. Elections are selection mechanisms favoring the candidates with the relatively more efficacious tax ideology and pressuring candidates with ineffectual tax ideologies to modify their views in light of electoral losses. Here, it is plausible to assume that both candidates and voters are ill informed about the way the world truly works.

Section 2 motivates the central assumption underlying our analysis: Commodity tax rates differ in the degree to which they are visible or hidden. Section 3 incorporates electoral competition into the Ramsey model and derives the resulting distortions to the commodity tax structure. Section 4 presents some extensions of the model. Section 5 compares our theory to alternative political explanations of the commodity tax structure. Section 6 discusses the implications of our model for tax reform.

2. VISIBLE TAXES, HIDDEN TAXES

The starting point of our analysis is the assumption that commodity tax rates differ in the degree to which they are visible or hidden. This assumption requires further justification. After all, tax rate information is “public information” in the sense that the public has access to government publications listing tax rates on all sorts of economic activities in exhaustive detail.

Even if tax rate information is publicly available, the public is not necessarily well informed about tax rates, and it is more ill informed about some tax rates than about others. Existing tax systems are very complex. Acquiring detailed rate information is costly. People who have high economic stakes in getting rate information about a specific tax pay a cost. They are then better informed about that specific tax rate than they are about other taxes. For example, a taxpayer who hires a tax accountant to advise her on a complicated income tax transaction involving the sale of one house and the purchase of another ends up having a more precise idea of the (implicit) tax rate on housing, but she
remains ill informed about the excise tax she recently paid when she
bought a firearm unaccompanied by her tax accountant.

People do, of course, get costless tax information as a by-product of
economic activities they engage in and get taxed for. But in a complex
world, there is virtually an infinite amount of information competing
for people’s attention. In the presence of even a small cognitive cost of
processing information, people do not pay attention to all the “cost-
less” information they are smothered with. They acquire information
only if it comes in an easily digestible or entertaining form or if they
have a significant economic stake in the information. For example,
California has an 8.25% sales tax rate that is indiscriminately applied
to many goods and services (counter to the Ramsey rule). It is standard
for prices to be advertised net of the sales tax, which is explicitly ap-
plied at the time of the retail sales transaction. Most Californians ob-
serve the sales tax on a daily basis; they are aware that it exists, and
many of them have a precise idea of the exact rate. But most Califor-
nians are at best vaguely aware that there also exist federal producer-
level excise taxes that are levied prior to the retail sales transaction,
and they certainly do not have detailed rate information about special
taxes levied on items such as firearms, telephone service, insurance
policies, tires, vaccines, alcohol, tobacco, sporting goods, luxury cars,
chemicals, minerals, and fuel.

There is another reason why consumers are poorly informed about
their tax burden. It takes specialized knowledge (which is costly to ac-
quire) to make sense of costless information about taxes. Consider, for
example, the value-added tax (VAT), a commodity tax widely used in
many European countries. This tax is levied on producers prior to the
retail sales transaction. Because consumers do not bear the legal inci-
dence of the VAT, they do not learn about the tax in the course of the
sales transaction. The legal incidence of a VAT, or the obligation to re-
mit the tax payment to the revenue authorities, falls on producers. In
contrast, the economic incidence, or the true burden measured by lost
surplus, falls on both producers and consumers: Each side of the mar-
et bears a tax in proportion to the relative inelasticity of supply and
demand. Consumers would have to have an understanding of the eco-
nomic concept of tax incidence and information about the relevant
price elasticities to make a precise inference about the effective tax
rate they end up paying. This is clearly not standard equipment for the large mass of consumers.

There are many other hidden taxes on commodities. Imports are subject to an array of protectionist measures, including tariffs. In the United States, the employer portion of Social Security does not appear on employee payroll stubs. Unemployment insurance is funded entirely through employee-level taxes. Corporate income is subject to the corporate income tax, which is levied separately to and on top of the income tax paid by shareholders; to the extent that the corporate and noncorporate sectors produce different outputs, corporate-sector taxes can be regarded as a form of commodities tax.

Hidden taxes on commodities also show up in the form of regulatory mandates. These taxes are not directly observed by the shareholders, employees, and consumers who ultimately bear the tax burden. For example, environmental regulation imposes tax-like costs that consumers cannot directly observe and even experts find hard to measure. Health care coverage comes with a complicated array of mandatory and voluntary employer contributions; it takes specialized (and costly) accountants to negotiate this patchwork of provisions.

3. FORMAL ANALYSIS

THE RAMSEY BENCHMARK

The starting point for our formal inquiry is the partial equilibrium model of the Ramsey tax problem developed by Atkinson and Stiglitz (1980, 367-69), which abstracts from cross-price and income effects. The model consists of a representative agent and a social planner. The agent consumes two private goods, indexed \( i = 1, 2 \), one public good, and leisure. The supply of private good \( i \) is perfectly elastic at producer price \( p_i \). An ad valorem tax \( t_i \) raises the consumer price \( q_i \) of good \( i \) to

\[
q_i = p_i (1 + t_i).
\]

The agent’s choice variables are the quantities demanded of the two private goods, \( x_1 \) and \( x_2 \). The Marshallian demand curves are given by
The agent’s utility increases with the consumer surplus derived from the provision of the two private goods. When taxes are imposed, consumer surplus declines by more than the tax revenue raised. (In Figure 1, the decrease in consumer surplus is given by area ABEDC, the increase in tax revenue by area ABDC.) The excess burden of taxing good \( i \) at rate \( t_i \) is given by

\[
b_i = \int_{x_i}^{\overline{x}_i} D_i(x_i)dx_i - p_i(\overline{x}_i - x_i),
\]

where \( x_i \) and \( \overline{x}_i \) are the quantities demanded before and after the tax is introduced. (In Figure 1, the area BEGF corresponds to the first term in Equation (2), the area DEGF to the second term; the difference between these two areas, ABEDC − ABDC = BEGF − DEGF = BED, captures the excess burden of taxation.)

The social planner’s choice variables are the two tax rates, \( t_1 \) and \( t_2 \). He or she wishes to minimize the total excess burden of taxation subject to the constraint that he or she must meet the revenue requirement.
$r^2$ to provide the public good. The revenue raised by a given set of taxes is

$$r = \sum_{i=1}^{n} t_i p_i \bar{x}_i.$$  

(3)

Thus, the government budget constraint is

$$\sum_{i=1}^{n} t_i p_i \bar{x}_i \geq r^0.$$  

(4)

The social planner’s constrained maximization problem is formulated as

$$\max_{\{t_1, t_2\}} = \sum_{i=1}^{n} b_i(t_i, t_2) + \lambda \left[ r(t_i, t_2) - r^0 \right]$$  

(5)

The first-order condition with respect to the tax rate $t_i$ is given by

$$-\frac{\partial b_i}{\partial t_i} + \lambda \frac{\partial r}{\partial t_i} = 0.$$  

(6)

Because

$$\frac{\partial b_i}{\partial t_i} = -q_i \frac{\partial \bar{x}_i}{\partial t_i} + p_i \frac{\partial \bar{x}_i}{\partial t_i},$$  

(7)

and

$$\frac{\partial r}{\partial t_i} = p_i \bar{x}_i + \lambda p_i \bar{x}_i + \lambda p_i t_i \frac{\partial \bar{x}_i}{\partial t_i},$$  

(8)

it follows that the first-order condition (6) is equivalent to

$$q_i \frac{\partial \bar{x}_i}{\partial t_i} - p_i \frac{\partial \bar{x}_i}{\partial t_i} + \lambda p_i \bar{x}_i + \lambda p_i t_i \frac{\partial \bar{x}_i}{\partial t_i} = 0.$$  

(9)

Using Equation (1), Equation (9) can be rewritten as

$$t_i \frac{\partial \bar{x}_i}{\partial t_i} + \lambda \bar{x}_i + \lambda t_i \frac{\partial \bar{x}_i}{\partial t_i} = 0.$$  

(10)
Equivalently, it holds that

$$\frac{\lambda}{1 + \lambda} = -\frac{t_i}{\lambda} \frac{\partial \bar{x}_i}{\partial t_i}$$  \hspace{1cm} (11)

The right-hand-side of Equation (11) can be rewritten as

$$\left( \frac{t_i}{1 + t_i} \right) - \frac{\partial \bar{x}_i}{\partial p_i(1 + t_i)} \left( \frac{p_i(1 + t_i)}{\bar{x}_i} \right) = \left( \frac{t_i}{1 + t_i} \right) \varepsilon_i,$$  \hspace{1cm} (12)

where $\varepsilon_i \equiv \frac{\partial p_i}{\partial q_i \bar{x}_i}$ is the price elasticity of demand for good $i$. (The elasticity is defined so as to be positive in sign.) Equations (11) and (12) imply the standard Ramsey formula for an efficient commodity tax structure, requiring the tax rate on good $i$ to be set inversely proportional to the price elasticity of demand for that good:

$$\frac{t_i}{1 + t_i} = \frac{\theta}{\varepsilon_i},$$  \hspace{1cm} (13)

where $\theta \equiv \frac{\lambda}{1 + \lambda}$. The first-order condition (6) leads to Equation (13), which defines the relative tax rates. The absolute tax rates are determined by the social planner’s first-order condition with respect to the tax revenue constraint,

$$r - r^0 = 0,$$  \hspace{1cm} (14)

or, equivalently, using Equation (3),

$$r^0 = t_1 \bar{x}_1 + t_2 \frac{p_2}{p_1} \bar{x}_1.$$  \hspace{1cm} (15)

The Ramsey rule serves as a benchmark for our subsequent analysis: The efficient commodity tax structure sets relative tax rates inversely proportional to price elasticities of demand. This is the tax structure implemented by a social planner seeking to minimize the tax burden.

The distinction between relative tax rates, which satisfy Equation (13), and absolute tax rates, which satisfy Equations (13) and (15), is important in our analysis; henceforth, the bold font shall distinguish relative tax rates, $t_i$ and $t_2$, from absolute tax rates, $t_1$ and $t_2$. The
ENTER ELECTORAL COMPETITION

We now develop a two-period Ramsey model with electoral competition. The social planner turns into an elected policy maker, the representative consumer-taxpayer into a representative voter. In the first period, the policy maker sets the tax structure. The voter observes the tax structure and decides whether to reelect the incumbent or replace him or her with a challenger. The election winner sets the tax structure in the second period.

With this general idea of the model in mind, we now define more precisely the players’ preferences, the information structure, the balanced budget requirement, and the exact sequence of moves. We then derive the equilibrium tax structure in the first and second periods and the voter’s equilibrium voting rule. Finally, we discuss the mechanics of how an incumbent can “fool” a rational voter and the implications of relaxing the finite-horizon assumption.

PREFERENCES

The incumbent, the challenger, and the voter have identical preferences about the tax structure: They desire relative tax rates to be set so as to minimize the tax burden subject to the budget constraint, as specified in Equation (5). The incumbent’s preferences differ from voter’s, however, in that he or she also cares about holding office. (Whether a challenger cares about holding office in the event that he or she wins the election is irrelevant because the game ends after the first period in office.) The incumbent’s office motivation is captured by an index variable \( \pi \) that enters the incumbent’s maximization problem in an additive way. This variable takes on the value \( \pi \) when the candidate holds office and the value zero otherwise, \( \pi \in [0, \infty) \). The parameter \( \pi \) captures the degree to which the incumbent is office motivated; it is zero if the incumbent cares only about voter welfare and goes to infinity as the reelection goal becomes dominant.

The incumbent’s choice variable is the tax structure. He or she sets relative commodity taxes, \( t_1 \) and \( t_2 \), so as to minimize the first-period tax burden subject to the budget constraint, on one hand, and to maximize the probability of reelection multiplied by the value of reelection, \( \pi \).
The voter’s choice variable is whether to reelect the incumbent \( v = 1 \) or replace him or her with a challenger \( v = 0 \). The sole purpose of the election is to serve as a selection mechanism. Political candidates differ in the tax burden they generate in providing the public good. We can think of candidates being drawn randomly from a pool of candidates with different revenue requirements. Formally, we assume that the candidate-specific revenue requirement is drawn from a normal distribution with strictly positive mean and strictly positive but finite variance \( \sigma^2_r \).

INFORMATION STRUCTURE

If the voter could directly observe the candidates’ revenue requirements, he or she would keep the incumbent in office if the incumbent’s revenue requirements were lower than the challenger’s and replace the incumbent otherwise. The tax rates set by the incumbent would not affect his or her reelection prospects, and the incumbent would have no reason to deviate from the Ramsey rule. Our model becomes interesting only if the voter cannot directly observe the candidates’ revenue requirements. To analyze the effects of hidden taxes, we must impose some additional information structure on the Ramsey model, which in its original formulation implicitly assumes that both the representative agent and the social planner are fully informed about all the variables in the model.

We assume that the voter has no information about the challenger’s revenue requirement; the voter only knows the distribution of revenue requirements in the pool of available candidates from which the challenger is drawn. The voter forms inferences about the incumbent’s revenue requirement based on observed taxes. Specifically, we assume that the voter observes the tax signals \( s_1 \) and \( s_2 \), which are correlated with the absolute tax rates \( t_1 \) and \( t_2 \):

\[
s_i = t_i + e_i, \quad (16)
\]

where the error \( e_i \) is randomly drawn from a normal distribution with zero mean and strictly positive but finite variance \( \sigma^2_{e_i} \); the errors \( e_1 \) and \( e_2 \) are independent draws. The visibility of a tax rate is inversely related to the variance of the error in the tax signal, \( \sigma^2_{e_i} \).
generality, we assume that the tax rate applied to Good 1 is relatively visible, whereas the tax rate applied to Good 2 is relatively hidden: 
\[
\sigma^2_{e1} < \sigma^2_{e2},
\]

Market prices are another potential source of information about tax rates. To calculate the demand, the voter must be able to observe consumer prices \( q_1 \) and \( q_2 \). We assume, however, that the voter cannot directly observe producer prices \( p_1 \) and \( p_2 \), which are subject to random market shocks. This assumption ensures that the voter cannot make a perfect inference about the tax rates \( t_1 \) and \( t_2 \) using Equation (1). For simplicity, we assume that the producer prices are drawn independently from the same distribution, which has strictly positive support and infinite variance. The assumption that the two producer prices have the same variance allows us to focus on the role of differentially precise tax signals.\(^3\) The assumption that the producer price distribution has infinite variance simplifies the voter’s inference problem; because producer prices are pure noise, the voter’s price estimates do not feed into his or her tax estimates.

We assume that the incumbent does not observe producer prices, nor does the incumbent know his or her revenue requirements when they set tax rates prior to the election. The assumption that the incumbent does not know producer prices is both convenient and empirically plausible. The assumption that the incumbent is uncertain about his or her efficiency in providing the public good plays an important analytical role, discussed earlier, and simplifies the analysis. The consequences of relaxing this assumption are laid out in related models in Rogoff and Sibert (1988), Rogoff (1990), and Coate and Morris (1995).

**BALANCED BUDGET REQUIREMENT**

We assume that the incumbent is constrained to balance the budget. The incumbent obviously cannot set taxes to balance the budget if he or she does not know the producer prices and the revenue requirement. Instead, we assume that the incumbent’s choice variable consists of the relative tax rates, \( t_1 \) and \( t_2 \), on the two commodities. The absolute tax rates, \( t_1 \) and \( t_2 \), are then determined by the government budget constraint after the producer prices and the revenue requirement are real-
ized. This sleight of hand comes at no cost in explanatory power because the central claim of our analysis pertains to relative tax rates.

SEQUENCE OF MOVES

The model consists of two periods. For simplicity, the discount factor is set equal to 1. To reduce notational clutter, first-period variables are assigned lower-case letters, and second-period variables are given capital letters. It is also useful to keep in mind that relative and absolute tax rates are distinguished by the bold font. For example, first-period relative tax rates are labeled $t_1$ and $t_2$, and second-period relative tax rates are labeled $T_1$ and $T_2$; first-period absolute tax rates are labeled $t_1$ and $t_2$, and second-period absolute tax rates are labeled $T_1$ and $T_2$.

In the first period, the policy maker sets the relative tax rates $t_1$ and $t_2$. Nature draws the producer prices $p_1$ and $p_2$, and the incumbent’s revenue requirement $r^0$. The absolute tax rates $t_1$ and $t_2$, the consumer prices $q_1$ and $q_2$, and the quantities demanded $x_1$ and $x_2$ are thus determined via Equations (1) and (15). Nature also draws the errors $e_1$ and $e_2$. The voter observes the tax signals $s_1$ and $s_2$, as well as the consumer prices $q_1$ and $q_2$. The voter then decides whether to reelect the incumbent or replace the incumbent with a challenger. The election winner resets the relative tax rates to $T_1$ and $T_2$. Nature draws the producer prices $P_1$ and $P_2$. If the incumbent was dismissed, Nature draws the challenger’s revenue requirement $R^0$; otherwise, the incumbent remains in office with the revenue requirement $r^0$. The absolute tax rates $T_1$ and $T_2$, the consumer prices $Q_1$ and $Q_2$, and the quantities demanded $X_1$ and $X_2$ are thus determined. The game ends, and the players’ payoffs are realized.

DEFINITION OF EQUILIBRIUM

A perfect Bayesian Nash equilibrium is given by: the relative tax rates $t_1^*$ and $t_2^*$ set by the incumbent; the voter’s voting rule, which $v(s_1, s_2, q_1, q_2)$ maps the voter’s observations (tax signals and consumer prices) into a decision to vote for the incumbent ($v = 1$) or replace them with the challenger ($v = 0$); and the relative tax rates $T_1^*$ and $T_2^*$ are set by the election winner. The player’s strategies are best responses. The voter uses Bayes’ rule to update his or her beliefs, summarized by the
conditional expectation $E(r^*|s_1, s_2, q_1, q_2)^*$. (The asterisk indexes equilibrium strategies and beliefs.)

**EQUILIBRIUM SECOND-PERIOD TAX STRUCTURE**

The finite-horizon assumption conveniently allows us to solve the model by backwards induction, and so we begin by analyzing the election winner’s decision problem. In the second (and last) period, re-election is infeasible by assumption. The election winner thus cares only about minimizing the tax burden. He or she follows the Ramsey rule in setting relative tax rates $T_1^*$ and $T_2^*$ (Equation (13)). The absolute tax rates are determined by the relative tax rates and Nature’s draws of the producer prices and the election winner’s revenue requirement (Equation (15)). The second-period tax burden increases with the election winner’s revenue requirement (cf. Equations (2), (7), and (15)).

**EQUILIBRIUM VOTING RULE**

At the time of the vote, the voter cannot ex post change the first-period tax burden, but he or she can influence the expected second-period tax burden by voting to maximize the probability that the candidates with the highest expected revenue requirement hold power in the second period. This is equivalent to maximizing the voter’s “indirect utility function” over the election winner’s revenue requirement. The equivalence comes with the assumption that the election winner sets relative tax rates that are uninfluenced by his or her revenue requirement, consistent with the Ramsey rule.

The voter computes a posterior expectation of the incumbent’s revenue requirement, $E(r^*|s_1, s_2, q_1, q_2)^*$. The voter also computes the expected revenue requirement of the challenger, $E(R^*)$, based on the distribution of revenue requirements in the pool of available candidates. The voter then compares his or her estimate for the incumbent, $E(r^*|s_1, s_2, q_1, q_2)^*$, to the expected value for the challenger, $E(R^*)$. The voter follows a cutpoint voting rule: If the estimate $E(r^*|s_1, s_2, q_1, q_2)^*$ lies below the cutpoint $E(R^*)$, the voter reelects the incumbent; otherwise, the voter replaces the incumbent with the challenger.
The voter’s point of indifference between voting for the incumbent and replacing him or her with a challenger.

The voter forms the equilibrium posterior estimate \( E(r^0 | s_1, s_2, q_1, q_2) \), making use of his or her observations, knowledge of the equilibrium first-period tax structure, and Bayes’s rule. The voter knows the equilibrium-relative tax rates \( t_1^* \) and \( t_2^* \) (the incumbent does not know his or her own type at the time of setting relative tax rates so that the choice cannot depend on their type, which implies that all types set the same relative tax rates in equilibrium). The voter knows the government budget constraint (15) that relates the revenue requirement \( r^0 \) to producer prices \( p_1 \) and \( p_2 \), absolute tax rates \( t_1 \) and \( t_2 \), and quantities demanded \( \bar{x}_1 \) and \( \bar{x}_2 \). The voter also knows Equations (16) and (1) relating the observed tax signals \( s_1 \) and \( s_2 \) and consumer prices \( q_1 \) and \( q_2 \) to producer prices \( p_1 \) and \( p_2 \) and absolute tax rates \( t_1 \) and \( t_2 \), and he or she knows the quantities demanded \( \bar{x}_1 \) and \( \bar{x}_2 \).

Solving Equation (1) for \( p_i \), substituting it into Equation (15), and taking expectations yields

\[
E(r^0 | s_1, s_2, q_1, q_2) = E(t_1 | s_1) q_1 \bar{x}_1 + E(t_2 | s_2) q_2 \bar{x}_2, \quad (18)
\]

where

\[
E(t_i | s_i) = \frac{\sigma_{e_i}^2}{\sigma_{e_i}^2 + \sigma_{r_0}^2} E(t_i^*) + \frac{\sigma_{r_0}^2}{\sigma_{e_i}^2 + \sigma_{r_0}^2} s_i. \quad (19)
\]

The voter’s estimate of the absolute tax rate \( t_i \), which feeds into his or her estimate of the incumbent’s revenue requirement \( r^0 \), is a linear combination of the voter’s prior \( E(t_i^*) \)—the expected absolute tax rate that follows from an incumbent of average quality setting the equilibrium relative tax rate \( t_i^* \)—and the observed tax signal \( s_i \). The relative weight the voter places on his or her observation increases with the variance of the distribution of revenue requirements, \( \sigma_{r_0}^2 \), and decreases with the error variance of the tax signal, \( \sigma_{e_i}^2 \).
EQUILIBRIUM FIRST-PERIOD TAX STRUCTURE

When compared to the social planner’s maximization problem, the first-period incumbent’s problem contains an additional term,

\[ \Pr[E(r^0|s_1, s_2, q_1, q_2)^* \leq E(R^0)|t_1, t_2]\pi, \]

that is, the probability that the incumbent is reelected, which occurs if the voter’s estimate of the incumbent’s revenue requirement, \(E(r^0|s_1, s_2, q_1, q_2)^*\), lies below the cutpoint \(E(R^0)\), multiplied by the value of re-election, \(\pi\). The incumbent’s first-order condition for setting the tax rate \(t_i\) thus contains an additional term:

\[ \frac{\partial \Pr\left[ E(r^0|s_1, r_2, q_1, q_2)^* \leq E(R^0)|t_1, t_2 \right]}{\partial t_i} \pi. \]

The magnitude of the electorally motivated deviation from the Ramsey rule for the relative tax rate thus depends on how much a marginal change in the relative tax rate changes the incumbent’s probability of reelection and how much the incumbent cares about reelection.

Before we analyze the reelection term in the incumbent’s first-order condition in detail, it is worth mentioning how the first-order condition is shaped by our assumption that the incumbent does not know his or her own quality at the time of setting tax rates. Such knowledge would strengthen or weaken the incumbent’s reelection motive. Because the incumbent cares not only about reelection but also about voter welfare, an incumbent of above-average quality would have a stronger incentive to get reelected because he or she prefers to stay in power rather than be replaced by a challenger who, in expectation, comes with a larger tax burden. Conversely, an incumbent of below-average quality would have a weaker incentive to get reelected. (Indeed, if the parameter \(\pi\) denoting the importance of the reelection goal were sufficiently small, we might even encounter incumbents who are so incompetent that they perversely distort the tax structure opposite to the direction predicted by our theory, increasing visible taxes and decreasing hidden taxes, so as to thwart their reelection chances!) In short, the assumption that the incumbent does not know
his or her own quality eliminates a reelection motive that by itself would serve as a source of behavioral variation across types.

We now return to the analysis of the reelection term in the incumbent’s first-order condition. From the incumbent’s perspective, reelection is uncertain: It depends on factors beyond his or her control—namely, Nature’s draws of the incumbent’s revenue requirement \( r^0 \), the producer prices \( p_1 \) and \( p_2 \), and the errors \( e_1 \) and \( e_2 \), all of which affect the voter’s estimates of the incumbent’s revenue requirement, \( E(r^0 | s_1, s_2, q_1, q_2) \), and thus affect the probability that this estimate lies below the exogenously fixed cutpoint \( E(R^0) \). The incumbent does, however, control one factor affecting the voter’s estimate \( E(r^0 | s_1, s_2, q_1, q_2) \): the relative tax rates \( t_1 \) and \( t_2 \).

Suppose the incumbent starts out with the relative tax rates prescribed by the Ramsey rule, \( t_1^R \) and \( t_2^R \), which minimize the tax burden. In our model, the two goods are identical (other than having different error variances in their tax signals), implying that they would be equally taxed: \( t_1^R = t_2^R \). Now suppose the policy maker decreases the visible relative tax rate \( t_1 \) so as to move toward the lower equilibrium tax rate \( t_1^* \) and increases the hidden tax rate \( t_2 \) so as to move toward the higher equilibrium tax rate \( t_2^* \). He or she thereby achieves a net increase in the probability of reelection because the posterior estimate \( E(r^0 | s_1, s_2, q_1, q_2) \) responds more sensitively to the decrease in the visible tax rate \( t_1 \) and less sensitively to the increase in the hidden tax rate \( t_2 \):

\[
E \left[ \frac{\partial E(r^0 | s_1, s_2, q_1, q_2)}{\partial t_1} \right] _{t_1 = (t_1^R, t_2^R)} = \frac{q_1 \bar{x}_1}{1 + E(t_1 | v_1)} \frac{\partial E(t_1 | v_1)}{\partial x_1} \frac{\partial x_1}{\partial t_1} \left| _{t_1 = (t_1^R, t_2^R)} \right. \\
> \left[ \frac{q_2 \bar{x}_2}{1 + E(t_2 | v_2)} \frac{\partial E(t_2 | v_2)}{\partial x_2} \frac{\partial x_2}{\partial t_2} \right] _{t_2 = (t_1^*, t_2^*)} \\
= \left[ \frac{\partial E(r^0 | s_1, s_2, q_1, q_2)}{\partial t_2} \right] _{t_2 = (t_1^*, t_2^*)}
\]
To see why Equation (20) holds, it is useful to study its components separately. First, the inequality

$$E \left[ \frac{q \tau_1}{1 + E(t_1 | s_1)} \right] > E \left[ \frac{q \tau_2}{1 + E(t_2 | s_2)} \right]$$

(21)

holds for $E(t_1 | s_1) < E(t_2 | s_2)$, which is the case for $t_1^* < t_1 < t_2^* = t_2 < t_2^*$.

Second, and most important, the inequality

$$\frac{\partial E(t_1 | s_1)}{\partial s_1} = \frac{\sigma^2}{\sigma_{e_1}^2 + \sigma_n^2} > \frac{\sigma^2}{\sigma_{e_2}^2 + \sigma_n^2} = \frac{\partial E(t_2 | s_2)}{\partial s_2}$$

(22)

follows from $\sigma^2_{e_1} < \sigma^2_{e_2}$.

Third, the equality

$$\frac{\partial s_1}{\partial t_1} = \frac{\partial s_2}{\partial t_2}$$

(23)

follows immediately from Equation (16).

Fourth, the equality

$$\frac{\partial t_1}{\partial t_1} = \frac{\partial t_2}{\partial t_2}$$

(24)

follows from the symmetric producer price distribution.

Figure 2 illustrates the mechanics of Equation (20), particularly the expression in Equation (22). (For the purposes of this illustration, we assume that the incumbent’s revenue requirement and the producer prices take on their mean values.) Recall that the voter knows the equilibrium relative tax rates $t_1^*$ and $t_2^*$; his or her inference problem is concerned with the absolute tax rates $t_1$ and $t_2$, which are informative about the incumbent’s revenue requirement $r$. The tax signals $s_1$ and $s_2$ do not “move” the voter’s posterior beliefs about the relative tax rates; they only affect his or her estimate of the absolute tax rates. If the incumbent sets the Ramsey-relative tax rates $t_1^R$ and $t_2^R$, he or she thereby generates the probability density functions of the tax signals $s_1 = t_1^R + e_1$ and $s_2 = t_2^R + e_2$, graphed in Figures 2A and 2B. Mean-
while, the voter expects the incumbent to set the equilibrium relative tax rates $t_1^*$ and $t_2^*$. As a result, the probability that the voter observes a tax signal $s_1$ implying an above-average absolute tax on good 1, $\Pr(s_1 \geq t_1^* \mid t_1 = t_1^R)$, is greater than the probability that the voter observes a tax signal $s_2$ implying a below-average absolute tax on good 2, $\Pr(s_2 \leq t_2^* \mid t_2 = t_2^R)$, which in turn is lower than average (the first probability is represented by the shaded area in Figure 2A, the second probability by the shaded area in Figure 2B):

$$\Pr(s_1 \geq t_1^* \mid t_1 = t_1^R) = \Pr(e_1 \leq t_1^R - t_1^*) > \Pr(e_2 \leq t_2^* - t_2^R) = \Pr(s_2 \leq t_2^* \mid t_2 = t_2^R).$$

(25)

By setting the equilibrium relative tax rates $t_1^*$ and $t_2^*$, incumbent equalizes the probability that he or she looks good on one tax dimension and look bad on the other (the respective probabilities, each of them equal to one half, are represented by the shaded areas in Figure 2C and 2D).

In summary, the incumbent deviates from the tax structure prescribed by the Ramsey rule, setting the visible tax rate $t_1$ inefficiently low and the hidden tax rate $t_2$ inefficiently high. The politically induced distortion to the tax structure increases with the strength of the reelection motive, $\pi$.

At first glance, it is puzzling why an incumbent who cares about the welfare of the representative voter but also desires to be reelected by that same voter would have incentives to be reelected by that same voter would have incentives to deviate from the Ramsey tax schedule. It would seem that there should be no conflict between the incumbent’s welfare and reelection goals, given that the voter is anxious to vote for a candidate who will minimize the voter’s future tax burden. This intuition is, however, wrong if

1. the voter cannot directly observe the candidates’ revenue requirement and the implied tax burden,
2. the voter forms inferences about the incumbent’s revenue requirement and the implied tax burden based on his or her tax information,
3. the voter is better informed about some taxes than about others, and
Figure 2: Probability Density Functions of Tax Signals

NOTE: $t_1 < t_1^R = t_2^R < t_2$, where $t_1^R, t_2^R$ are the Ramsey tax rates and $t_1, t_2$ are the equilibrium tax rates.
4. the voter cannot commit to ignore his or her tax information (specifically, he or she cannot commit to follow a voting rule that would eliminate the tax distortion).

The voter rationally weighs accurate tax information more heavily than noisy tax information. Because he or she knows the equilibrium tax structure, what the voter observes only affects his or her posterior beliefs about the relative tax rates; a voter’s posterior beliefs about the absolute tax rates, which are perfectly correlated with the incumbent’s revenue requirement. Thus, when a visible tax appears to take on a low value, the voter assigns a high weight to the probability that this observation is caused by the incumbent having a low revenue requirement and a low weight to the probability that this observation is caused by the random error in the tax signal; after all, the variance of that error is low. Conversely, when a hidden tax appears to take on a high value, the voter assigns a low weight to the probability that this observation is caused by the incumbent having a high revenue requirement and a high weight to the probability that this observation is caused by the random error in the tax signal; after all, the variance of that error is high. The incumbent takes as given the asymmetric weights in the voter’s inference problem and best responds to it. As a result, the incumbent achieves a net increase in his or her probability of reelection by looking good on the visible dimension of tax policy at the price of looking bad on the hidden dimension.

FOOLING THE VOTER

One concern we might have about this result is that it seems to allow the incumbent to fool the voter: Surely, a rational voter would see through the incumbent’s manipulations. The answer to this concern is that the voter’s inference problem does indeed take into account that the tax structure will be distorted. Recall that the incumbent does not know his or her own type at the time of setting relative tax rates, so the incumbent’s choice does not depend on type, which implies that all types set the same relative tax rates in equilibrium. The voter knows what the relative tax rates are, not because he or she can observe them directly but because the voter knows the incumbent’s equilibrium strategy. Because the visible tax is set lower than the hidden tax, the
tax signal on the visible tax will be lower on average than the tax signal on the hidden tax. When the voter processes the information contained in the two tax signals, he or she discounts observations by the known bias (cf. Equation (19)). (This result does not hinge on the voter knowing the exact bias in equilibrium. If the bias were subject to some random disturbance, or if different types of incumbents generated different biases, the voter would discount his or her observations by the expected bias.)

Because the voter “folds” the electorally motivated distortion to the tax structure into his or her inference problem, the incumbent cannot systematically fool the voter and improve the incumbent’s reelection prospects in equilibrium. Nonetheless, the incumbent is trapped into executing the futile attempt to fool the voter precisely because the voter expects the incumbent to attempt to fool the voter. If the incumbent failed to attempt to fool the voter and instead followed the Ramsey tax schedule, the voter would not be able to tell that the incumbent was deviating from the equilibrium prescription, and so the voter would update as if the incumbent had attempted to fool the voter, implying that the incumbent’s probability of reelection would lie below the equilibrium probability of reelection. This reduced reelection probability would be unacceptable to the incumbent, who cares about his or her reelection prospects. Thus, the incumbent would have incentives to deviate from the Ramsey tax schedule up to the point where the marginal benefits from improving the incumbent’s reelection prospects and the marginal welfare costs of increasing the tax burden are equalized. In short, it is not the incumbent’s desire to mimic or distinguish himself or herself from other types that drive the incumbent’s tax manipulations; it is the incumbent’s desire to “beat” the voter’s expectations that the incumbent will manipulate the tax structure.

INFINITE HORIZON

Our qualitative results are robust with respect to the finite-horizon assumption (with the exception noted below). In an infinite-horizon setting, incumbents are pitted against challengers who are associated with an expected stream of future tax burdens, including those that are realized when the challengers, once elected, subsequently lose
office and are replaced by a fresh draw, who in turn will be replaced some time in the future, and so on. This expected stream of future tax burdens falls into the cutpoint of voters’ voting rule. The cutpoint defines the voters’ point of indifference between voting for the incumbents and challengers. It is relative to this cutpoint that the incumbents seek to “look good” by distorting the tax structure so as to convince the voters that they are associated with a lower stream of expected future tax burdens than their challengers.

The critical assumption that distinguishes the finite-horizon setting from its infinite-horizon counterpart is that voters cannot commit to a voting rule. At the time of the election, they vote for the candidate associated with the highest future expected utility. Bygones are bygones: Voters do not punish incumbents for distorting the tax structure. Banks and Sundaram (1993) developed an infinite-horizon model of moral hazard and adverse selection that sheds light on the difference that an infinite horizon would make in our model: Voters would have leeway to “design” a voting rule so as to punish suspicious patterns of taxation and eliminate the tax distortion. In practice, however, we believe that our finite-horizon analysis has relevance for the infinite-horizon case. In any realistic setting, the optimal tax structure is subject to shocks, and such “designer” equilibria would involve complex nonstationary policy making and voting strategies and trigger strategy punishments. It is doubtful that many generations of incumbent policy makers and huge numbers of voters can achieve the necessary coordination to bring about an efficient outcome.

EXTENSIONS

Our model extends straightforwardly to the tax treatment of income versus consumption. The Ramsey analysis applies to intertemporal consumption by the simple act of relabeling the commodities according to the date when they are available for consumption (Ramsey 1927, 59; cf. Atkinson and Stiglitz 1980, 442-51). Assuming that consumption elasticities are more or less constant across periods, it is optimal to tax consumption and exempt savings. In practice, of course, capital bears a heavy tax burden. We conjecture that this distortion
arises at least in part because it is difficult for voters to make accurate calculations about the effective taxation of capital. Because capital taxes are partially deferred, the effective tax rate on current capital income is not simply the current statutory rate; the rate also depends on expected holding periods, future interest rates, and future tax rates, all of which are uncertain. Corporate taxation is “naturally” opaque to begin with, but it is further complicated by political design (Arlen and Weiss 1995).

Informational problems multiply with heterogeneous voters. Suppose that voters have different incomes, so that the policy makers must trade off efficiency and equity. The optimal tax system would impose progressive rates on wage income; to the extent that high-income voters earn more capital income than wage income compared to low-income voters, the optimal tax system may involve imposing taxes on capital income. Yet with progressive tax rates, the calculation of effective capital tax rates becomes even more opaque. Virtually any capital tax will have some distortionary effects, favoring some assets at the expense of others, if only because some assets lend themselves to be taxed on an accretion basis, whereas other assets are more conveniently taxed at the time they are sold. Markets levy implicit taxes on tax-favored assets. With progressive rates, market participants pay different implicit tax rates, and the calculation of these implicit rates requires knowledge of not only market prices but also the entire market equilibrium. Once again, this is not standard equipment for the mass of voters.

If we allow for voter heterogeneity in income, we must also accept the fact that voters have different incentives to gather costly tax information, with the result that they end up being differentially well informed. Policy makers would then have incentives to offer tax breaks to well-informed voters at the expense of increasing the tax rates imposed on ill-informed voters (cf. Lohmann 1998). High-income voters tend to be better informed compared to low-income voters. As a result, high-income voters would enjoy special tax breaks. In combination with the tax structure coming out of the efficiency-equity trade-off, we get a nominally progressive income tax system riddled with regressive tax loopholes—which is, of course, exactly what we observe in practice.
Like our study, the literature on political business cycles employs the logic of rational retrospective voting: Policy makers who preside over good economic performance tend to get reelected because voters rationally form inferences about the quality of the policy makers on the basis of observed economic performance (Rogoff and Sibert 1988; Rogoff 1990). In this literature, the social cost of retrospective voting takes on the form of counterproductive fluctuations in government spending, taxation, budget deficits, and the inflation tax, timed to make the incumbents look good prior to elections and bad when the next election is far off. The empirical record of these political business cycle models is very mixed (Alt and Chrystal 1983). In our view, this is not too surprising given the inertia to change that is present in just about any political system and the long and uncertain lags by which many policy instruments translate into policy outcomes experienced by economic agents and political constituents. Instead, we propose that electorally motivated distortions show up in the long-run structure of government spending and taxation. Office-motivated politicians tend to spend in visible ways and tax in hidden ways, with some hidden taxes taking on the form of budget deficits (which shift the tax burden into the future and have murky side effects on interest rates and other macroeconomic variables) and inflation (which taxes money holdings and can be confounded with changes in relative prices) (cf. Lucas 1973).

Concretely, the political business cycle literature, along with our analysis, suggests that the commodity tax structure will “cycle” over the course of the electoral term, with visible taxes falling and hidden taxes rising prior to elections and reverting to the Ramsey rule in off years. As a practical matter, we may well observe an electoral cycle in some highly salient commodity tax, but Congress and state legislatures do not fine-tune the large mass of commodity taxes in an ongoing way. In our opinion, a suitable test of our theory would be based not on a time-series analysis relating commodity tax rates to the timing of elections but on a “cross-sectional” analysis relating commodity tax rates to the levels of tax information held by voters or to commodity attributes that have implications for the levels of tax information held by voters (e.g., whether the commodities in question are big-ticket or small-ticket items; whether the standard sales tax or a commodity-specific sales tax applies).
ALTERNATIVE POLITICAL EXPLANATIONS
OF COMMODITY TAXES

In our model, electoral competition and incomplete information lead to distortionary commodity taxes. The literature applies a variety of alternative political theories to explain the commodity tax structure. In *Federalist 10*, James Madison raised the specter of majority rule leading to a “tyranny of the majority” (Madison [1787] 1894). Hunter and Nelson (1990) applied this argument to commodity taxation. A majority can, through judicious choice of commodity taxes, shift the tax burden onto a minority. Hunter and Nelson’s model implies that the excise tax rate levied on a particular base will be an inverse function of the relative size of the population consuming that base.

Olson (1965) invoked the free-rider problem of collective action to suggest that political decision making will favor special interests that are small in number and thus well organized and active, at the expense of diffuse interests that are large in number and thus unorganized and passive. Consequently, Seiglie (1990) argued that the commodity tax structure will reflect the structure of organized and unorganized interests. For example, in some states, the tax rate on liquor depends on the number and organization of liquor wholesalers and retailers who prefer a low tax rate, on one hand, and the existence of a competing interest group that seeks to reduce the consumption of alcohol by minors, on the other.

According to Stigler (1971) and Becker (1983), policy distortions arise because political processes and institutions assign weights to various groups of voters that do not correspond to the weights applied by the social planner. (For example, the free-rider problem of collective action in effect assigns high weights to narrow interests and low weights to diffuse interests; the fact that each state in the United States is represented by the same number of senators—two—in the U.S. Senate in effect assigns high weights to agricultural interests, which tend to dominate underpopulated states, and low weights to urban interests, which tend to reside in states with large populations.) Office-motivated politicians apply these political weights when they redistribute wealth across voter groups so as to maximize their political support. Hettich and Winer (1984, 1988, 1997) and Winer and Hettich (1991) applied this argument to taxes; Anderson, Shughart, and
Tollison (1989) and Seiglie (1990) applied it specifically to commodity taxes. For example, high-income citizens are better represented politically, compared to low-income citizens, in part because they have higher electoral participation rates and because legislators themselves tend to have above-average incomes. By employing regressive commodity taxes instead of progressive income taxes, high-income citizens shift a portion of their tax bill to low-income citizens.

These alternative hypotheses about the political economy of commodity taxes complement rather than compete with our hypothesis. The value added that comes with our informational explanation is best illustrated with reference to the work of Hettich and Winer. In a representative models of theirs (Hettich and Winer 1988), the government must impose taxes to finance a public good and choose the tax structure that maximizes its expected political support. In a world where equality of franchise does not translate into equality of influence, the government in effect maximizes a weighted sum of expected votes. The probability that a given voter supports the government depends on the benefits he or she derives from the public goods and his or her loss in income from taxation. The weight on the individual vote depends on the individual’s membership in an organized interest group and other political factors.

Hettich and Winer’s (1984, 1988, 1997) analysis builds on a “reduced-form” voter reaction function mapping taxes into expected votes. The assumptions made about the form of the reaction function obviously shape the results in critical ways. Because the reaction function model lacks microfoundations, Hettich and Winer’s comparative statics are vulnerable to the Lucas critique: The decision rules of private agents, which are buried in the reduced-form assumptions, may not be invariant to changes in exogenous parameters (Lucas 1976).

Indeed, our analysis suggests that one of Hettich and Winer’s (1984, 1988, 1997) implications would not survive informational microfoundations. Their model assumes that the government can improve its chances of reelection by distorting the tax structure. Our model implies that the policy makers’ attempts to improve their reelection chances are futile in equilibrium. Whether policy makers can affect their reelection chances has implications for the prospects of tax
reform. Hettich and Winer’s models imply that the government has no incentives to reform the tax structure. Our model implies that the policy makers’ tax manipulation is futile because it is anticipated by the voters. Thus, policy makers would willingly embrace a commitment technology that would allow them to “tie their hands” publicly.

**TAX REFORM AND THE TRANSPARENCY OF THE TAX SYSTEM**

This brings us to the question of tax reform. In recent years, scholars have analyzed a variety of measures that would restrict the discretionary powers of political representatives to tax and spend: the balanced budget amendment, the line item veto, campaign finance reform, and term limits (Buchanan 1995; Joyce 1996; Joyce and Reischauer 1997; Corrado et al. 1997; Carey 1996). These analyses are, by and large, based on the premise that the underlying political distortion is due to special interest pressures or “legislative failure” (dysfunctional legislative norms or legislative organization) (cf. Shepsle 1978; Weingast, Shepsle, and Johnsen 1981).

We argue that the problem arises more fundamentally with electoral competition and information asymmetries. Reform efforts would be well served to invest in “variance reduction,” that is, procedures and instruments that improve the transparency of the tax system and reduce the noise confounding the electorate’s inferences about the quality of their political representatives.

Tax reform proposals coming out of the theory of optimal taxation tend to treat the complexity or opaqueness of the tax system as a neutral attribute that has no effect on efficiency or equity (other than influencing the transaction costs of raising taxes). The Ramsey rule overthrows the conventional wisdom that a flat commodity tax is efficient. Ramsey’s (1927) emphasis on efficiency does not, however, take into account that a checkered system of commodity tax rates makes it all but impossible for voters to be well informed about commodity tax rates and likely for different voters to be differentially well informed about specific tax rates. Similarly, the theory of optimal income taxation trades off efficiency and equity to conclude that a progressive income tax is optimal. In practice, the resulting income tax schedule will
be complex because it must accommodate the huge variety of economic and social activities people engage in. But the very complexity of the income tax schedule opens the door to regressive tax loopholes. In the presence of electoral competition and information asymmetries, the transparency afforded by flat or simple tax schedules has the potential to promote efficiency and equity.

According to the standard argument, the complexity of the tax system is a source of fiscal illusion that makes voters underestimate the tax cost of public expenditures, causing an excessive "size of government" (Wagner 1976). Our take on the complexity of the tax system differs from the standard approach. Our theory does not rely on fiscal illusion; all it takes is a voter rationally responding to the informational cues emanating from the tax "performance" of elected policy makers.

NOTES

1. The substantive interpretation of our model disallows revenue requirements taking on values below zero. Technically, we could meet this substantive constraint by truncating at zero the normal distribution from which revenue requirements are drawn. To avoid messy calculations, we prefer to assume that the mean value of the candidates’ revenue requirements is sufficiently high, or their variance sufficiently small, so that the tail of the distribution containing the negative values is "negligible."

2. The visibility of a tax rate might follow endogenously from the voters’ incentives to gather costly tax information or pay costly attention to publicly available tax information. Formally, the idea of costly information gathering could be conceptualized by allowing the voters to purchase a reduction in the error variance of their tax signal at a cost (Lohmann 1998).

3. If the producer prices of the two commodities had different variances, our analysis (suitably extended) would imply that the commodity with the lower price variance will tend to be undertaxed, the commodity with the higher price variance, overtaxed. This extension is of empirical interest because the prices of big-ticket items tend to fluctuate less than do the prices of small-ticket items, possibly for search cost reasons (Stiglitz 1993).

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