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**“Rational Ignorance, Rational
Expectations, and Fiscal Illusion”**

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Roger D. Congleton

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Rational Ignorance, Rational Expectations, and Fiscal Illusion

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October 24, 1991

Abstract

The existence of fiscal illusion is generally argued to be a consequence of the process of optimal information acquisition. However, there has never been a careful statement of the conditions required for the process of information acquisition to generate biased expectations. This paper develops sufficient conditions for the existence of fiscal illusion in a context where the rational expectations hypothesis is used as a first approximation of individual expectations for policy matters on which they are at least partially informed. In this case, the *only* areas in which individuals could possibly have biased expectations are those in which they are *completely* ignorant. Given this, the central theoretical issue for the existence of fiscal illusion is whether or not circumstances exist where individuals remain completely ignorant of whole policy areas or relevant policy details rather than becoming weakly informed as assumed in rational expectations models. The paper characterizes conditions under which individuals will *choose* to remain completely ignorant of at least some policy matters and demonstrates such rational ignorance is a sufficient condition for the existence of fiscal illusion. Implications for electoral politics are explored.

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I. Introduction

Fiscal illusion occurs whenever voters have systematically biased expectations about the benefits or costs of public programs. To this extent, the existence of fiscal illusion is inconsistent with the existence of rational expectations. However, it is clearly possible that individuals might have unbiased expectations about some fiscal parameters, yet biased ones about others. Such a situation can arise, even in cases where individuals use the best available estimation procedures, if the information sets relied upon are not proper samples of the underlying distributions or are improperly filtered. This paper develops a theory of fiscal illusion based on the existence of rational ignorance, and analyzes properties of the fiscal knowledge most likely to be gathered and the fiscal errors that are most likely to occur. Even in cases where informed expectations are unbiased, the analysis suggests that the existence of rational ignorance is sufficient to cause biased estimates of the costs and/or benefits of government programs.

The modern public finance and public choice literatures have long been concerned with the extent to which voters are well informed on fiscal issues.¹ Downs (1957) and

¹ Buchanan (1960) attributes the first clear statement of the idea of fiscal illusion to Puviani (1897, 1903), although he himself is probably the leading modern exponent of fiscal illusion, see Buchanan (1965, 1966). Mueller (1989) provides an overview of recent developments and applications of fiscal illusion. Oates (1988) provides a somewhat skeptical overview of empirical evidence of the effect of fiscal illusion on the growth of government budgets. This author is less skeptical of the empirical case for fiscal illusion than Oates is, in part because the results of this paper suggest that fiscal illusion is likely to be commonplace.

Tullock (1967) state the original theoretical rationale for rational ignorance in a voting context. Because any single voter is unlikely to be decisive in a general election, each voter has very weak incentives to go to the poles and cast a vote based upon candidate differences, or to gather information about candidate policies. Appeals to civic duty are often required to explain why anyone is well informed or participates in elections.

This paper departs from the public choice tradition on fiscal illusion by focusing attention on private incentives to acquire fiscal information as a means of improving personal consumption decisions. Information about fiscal matters allows individuals to better allocate private funds to take account of complementary and substitution relationships between public services and private services. For example, knowledge of future mass-transit plans allows one to shift resources from (or to) private transport to (or from) other activities. The opportunity to vote in elections also affects decisions to acquire fiscal information, but this is, as we shall see, mainly because of increased uncertainty about future policies rather than prospects for influencing policy by casting votes. The analysis shows that individual incentives to learn fiscal details are greater after an election than before an election. Consequently, private plans may be based on better information than public plans.

The "personal planning demand" for fiscal information implies that individuals will be better informed about fiscal policies than the voting literature seems to imply. Yet, it also allows the possibility of considerable rational voter ignorance. Survey evidence provides ample evidence of citizen ignorance. See Neuman (1986). However, as long as whatever information obtained is unbiased or suitably filtered, rational ignorance is not necessarily a severe problem.² Voters would still vote for the candidates or policies that

The analysis below does not imply that government growth will be systematically increased by fiscal illusion, but, rather, that resources will be misallocated relative to a first best fiscal policy.

² Congleton and Sweetser (1991) demonstrate that unbiased fiscal ignorance may actually improve the performance of democratic decision making over what would have been the case

maximize their expected utility, and fiscal policies would reflect, in an expected value sense, the preferences of voters as weighted by the electoral system. Policy "errors" would be larger than would have been the case had voters obtained more or better information, but the results might well be as good as voters are interested in obtaining. Optimizing over informational matters can be fully consistent with rational policy expectations. On the other hand, if individuals gather information in other than a complete and uniform manner, their expectations may not be uniformly unbiased about all program details.

Much of the recent work on the power of special interest groups implicitly relies upon voter ignorance as the basis for the political influence of special interest groups. Under an open primary system, where any candidate may enter and seek to be elected, candidates who appeal to median voter self-interest would tend to do better than those who promote narrow economic, regional, or ethnic interests--unless many voters are ill-informed about relevant policy details or implications, or vote as if they were members of distinct interest groups. Recent pieces by Austin-Smith and Riker (1987), Tullock (1989), and Coughlin, Mueller and Murrell (1990) make explicit the manner in which informational problems may empower special interest groups.

The model developed below examines incentives to acquire information about fiscal parameters. To make the case for fiscal illusion as challenging as possible, a very strong version of the rational expectations hypothesis is adopted as a first approximation of individual expectations on policy matters for which they are at least partly informed. Informed individuals are assumed not only to be able to make efficient and unbiased estimates of fiscal parameters, but perfect ones. In this case, as we shall see, the problem of fiscal illusion reduces to whether individuals ever remain completely ignorant of whole policy areas or relevant policy details rather than become partly informed on all issues as

under perfect information by creating a Rawlsian veil of ignorance.

implicitly assumed in many rational expectations models.³

Section II of the paper develops a model of fiscal information gathering and characterizes sufficient conditions for rational ignorance. Section III models decisions to invest in intermediate levels of fiscal knowledge. Section IV of the paper examines properties of the fiscal illusion generated by rational ignorance and demonstrates that the existence of rational ignorance is a sufficient condition for the existence of fiscal illusion. Section V examines some best case electoral implications of fiscal illusion. It demonstrates that even well-behaved equilibria are unlikely to be first best outcomes in a setting where fiscal illusion is widespread. In the case examined, electoral outcomes *reflect the policy preferences of relatively well informed voters*, yet overall incorporate the effects of fiscal illusion.

II. A Model of Rational Ignorance

The conceptual foundation of fiscal illusion is what might be called natural ignorance. Individuals are born into the world in a naturally ignorant state, largely ignorant of all things. Through time the domain of natural ignorance shrinks as knowledge is accumulated and *decisions* to acquire more or less information play a larger role in determining whether various bits of information are acquired or ignored. As part of this process, awareness of one's own ignorance tends to *increase* as rational ignorance gradually displaces natural ignorance.⁴ This characterization of rational ignorance is, of

³ Fiscal illusion can also be the result of imperfect filtering or interpretation of data acquired. Imperfect filtering is ignored here to make the strongest analytical argument for the existence of fiscal illusion. See Heiner (1988) for a discussion of why imperfect filtering and decision making may tend to occur. It bears noting that even "perfect" filtering can yield biased expectations about events. This would be the case concerning events, although not losses, for individuals who use Bayesian filters chosen with an asymmetric loss function in mind.

⁴ In many areas of life, individuals are not even aware that decisions to invest in more or less information are possible. Most people are totally ignorant of the existence of quarks, the Feigenbaum number (4.6692...), the federal prerequisites for peanut production, the alloy

course, the resolution to the conundrum "the more we know the less we know."

Rational ignorance, unlike natural ignorance is systematic in the sense that it reflects the optimizing behavior of individuals given various constraints on information processing and acquisition.

An individual who is rationally ignorant of fiscal details makes private plans without full knowledge of available government services available or of the tax burdens borne. For example, a house might be purchased without acquiring information concerning planned real estate tax increases or changes in local government service levels. It is clear in such cases that additional information about public services potentially allows an improved allocation of private consumption expenditures and consequently a greater expected utility level.⁵ Knowledge of public service levels allows marginal rates of substitution between public and private services to be known. Knowledge of tax burden allows the private budget constraint to be known. The informative issue for a rationally ignorant person is whether the expected improvement in his private plans is sufficient to warrant the cost of additional fiscal information.

Both natural and rational ignorance can potentially generate fiscal illusion. For example, consider the case of an individual who is uninformed about a tax used to finance a desired public service. Regardless of the origins of an individual's ignorance, (never thought about learning about this tax, or thought about learning about this tax but decided not to), the result may be an estimated marginal tax price for this service that

composition of catalytic converters, and bicycle tariffs without ever having considered the possibility of being well informed on such matters. Natural ignorance remains commonplace even in adulthood. The model of rational ignorance developed above examines systematic aspects of decision making at the boundary of policy ignorance.

⁵ Fiscal information can also potentially improve private supply decisions as well. Trucking firms and farmers will change planned acquisition of new trucks and/or pasture land according to the level road or extension agent services provided by government. More generally, individuals often engage tax planning specialists who suggest labor supply and investment levels.

may be *systematically* different than the actual marginal tax price, that is to say fiscal illusion. Such individuals may over estimate his lifetime income and make plans which are systematically different from those that maximize utility. Ignorance of program benefits or costs can lead voters to systematically misjudge the worth of proposed programs. Whether such biased expectations do arise is a matter of the extent to which other information may be used to estimate the true values of unknown fiscal parameters.

Consider the following problem. Suppose that an individual acquires information sequentially and currently is informed of the existence of various fiscal parameters, but not their values. That is to say, suppose that the individual has to this point chosen to remain rationally ignorant of several fiscal parameters. Suppose further that the individual has the opportunity to purchase *definitive* information about future tax burden, and/or various service levels. Under what circumstances will the individual find it in his interest to be well informed?⁶

Essential features of this informational choice can be illuminated by analyzing the following model, which is the smallest that allows one to investigate both the allocative effects of fiscal knowledge and the demand for different kinds of fiscal knowledge. Let the typical tax payer's strictly concave utility function be monotone increasing in two private goods: current and future personal consumption, A and B, and two future government services, G and H. Assume that the individual knows the fundamental economic and fiscal arrangements. The individual knows his pretax lifetime income, Y, and understands that he will bear a tax equal to a fraction of the total cost of government services to be provided, $T = t (G+H)$. He does not at this point know the

⁶ Definitive information clearly is more valuable than information which allows one to make efficient unbiased forecasts. Thus if one can demonstrate that perfect information may not be worth its cost, the same conclusion would apply to equally costly but less accurate information. In a non-deterministic setting, one would have asked, under what circumstances would an individuals have been willing to assemble the information base necessary to generate rational (unbiased) expectations.

particular government service levels or, consequently, his future tax obligation, T .⁷

Individuals maximize expected lifetime utility by allocating their after-tax lifetime income between current and future consumption and fiscal information.

Initially it is assumed that "the government" determines future public service and tax levels independently of a particular individual's willingness to pay for them. In a median voter model of fiscal choice, this tends to be true for all individuals except those who share the median voter's ranking of fiscal policies. (Electoral implications of rational ignorance are taken up in Section V.) Knowledge of the underlying fiscal relationships allows us to use the structure of government finance to inform priors on the unknown fiscal parameters.

In order to characterize the value of partial and complete fiscal information, it is useful to examine first the choice that would have been made in a setting of perfect information. An individual who knows public service levels G , H and tax, T , would set current consumption A and future consumption B to maximize:

$$U = u(A, B, G, H) \quad (1.0)$$

subject to

$$Y - T = A + B \quad (2.0)$$

with

$$T = t(G+H)$$

and

$$0 \leq T \leq Y, \quad G = G_0, \quad H = H_0$$

$$U_A > 0, U_B > 0, U_G > 0, U_H > 0, U_{AA} < 0, U_{BB} < 0, U_{GG} < 0, U_{HH} < 0$$

$$U_{AB} > 0, U_{AG} > 0, U_{AH} > 0, U_{BG} > 0, U_{BH} > 0, \text{ and } U_{GH} > 0.$$

⁷ Under a proportional income tax with a balanced budget rule, this would simply be the fraction of total national income received by the individual in question, $t = Y/\sum^N Y_i$ for a population of N tax payers.

To simplify notation, all four goods are measured in the manner which yields a unit price for each good. Relative prices are assumed to be constant over the period of interest.⁸ Subscripted variables denote partial derivatives with respect to the subscripted variable.

Solving the constraint for private good B in terms of Y and T, substituting the result into the objective function, and differentiating with respect to A, allows the optimal level of private good A to be characterized for a given fiscal package.

$$U_A - U_B = 0 \tag{3}$$

Private good A would ideally be consumed at the level where the marginal utility generated by additional consumption equals the marginal opportunity cost of reduced consumption of B for the combination of government services provided.

The implicit function theorem allows the ideal, perfectly informed, consumption levels of good A and the resulting utility level to be written as functions of the parameters of the optimization problem. The individual consumes in the present according to the following "plan":

$$A^* = a(t, Y, G, H) \tag{4}$$

which yields utility level:

$$U^* = U(A^*, Y - A^* - t(G+H), G, H) \tag{5}$$

⁸ This would tend to be the case if all four goods are produced via a constant returns production technology. The rate of time preference is subsumed into the utility function. I abstract from the existence other known current services or taxes in order to simplify exposition. The focus here is on the expected utility generated by different levels of fiscal ignorance rather than relative price effects or historical service levels, so such details are minimized to facilitate analysis.

for given levels of G , H , t and Y . Consuming good A according to plan A^* ensures that levels of A and B are those which maximize utility for the existing fiscal parameters.

Now consider the case where fiscal information is neither possessed nor costlessly available. Fiscal ignorance changes the nature of the opportunity set faced by the tax payer/voter. If the individual is rationally, rather than naturally, ignorant of public service levels and tax burdens, he is aware of the existence of the tax burden and public services but not their values. Knowledge of the existence of various programs and tax obligations allows fiscal parameters to be guessed at, or estimated, but rational ignorance implies that such estimates will be of poor quality even if they are based upon the best use of currently possessed information.

The conventional Bayesian estimate in such circumstances is based on diffuse priors over the unknown parameters. In the case of interest here, the individual is assumed to know from past experience some general features of private and government finance. This general knowledge allows the domain of the diffuse priors to be bounded.⁹ The balanced budget constraint implies that the range of possible tax burdens can be no less than zero and no greater than the (lifetime) income (wealth) of the tax payer of interest. Thus, the prior probability distribution over possible tax burdens is bounded by the 0 - Y interval, with $f(T) = 1/Y$. It is zero elsewhere. Tax revenue similarly constrains the range of possible service levels that can be funded. The balanced budget assumption implies that public service levels lie between 0 and the maximum allowed by tax revenues. Knowledge of any two fiscal parameters implies a value for the third. Different

⁹ Better forecasts would have been made if the individual had past experience with these particular programs and their tax costs. In order to simplify analysis and strengthen the case for the existence of fiscal illusion, it has been assumed that any information that becomes available to an individual allows him to make *perfect* forecasts of relevant fiscal parameters--not just better ones. This sharp informational assumption allows us to postpone analysis of any bias generated by processing and/or filtering readily available (*costless*) information for future research. Simply put, the programs of interest here are ones that can not be costlessly learned about.

assumptions about public and private budget constraints would impart different but fundamentally similar knowledge of the range of possible values for unknown programs.

Expectations based upon such Bayesian calculations are rational in Muth's (1961) sense insofar as they are conditioned on the *best use of all the information possessed* by the individual at the moment of choice. However, the resulting expectations differ from Muth's original specification in that rational ignorance implies that expectations are not based upon complete knowledge of the underlying political and economic processes involved and therefore may not be unbiased.

Initially, the individual is rationally ignorant of T, G and H. Since each combination of public service levels implies a particular tax level, a tax payer's diffuse fiscal priors can be written as a function of G and H, $f(G,H) = (t^2/Y(Y-tG))$ within the feasible range of public services. This implies an expression for expected utility of the form:

$$U^e = \int_0^{Y/t} \int_0^{(Y-tG)/t} U(A, Y - A - t(G + H), G, H)(t^2/Y(Y-tG)) dH dG \quad (6)$$

It bears noting unless one's tax burden is known, after tax income is unknown. Committing to specific levels of either current or future consumption implies that the other is undetermined prior to learning the actual tax burden. The temporal order of decision making implies that an individual will select a value for current consumption, A, and adjusts future consumption, B, as necessary given the tax burden revealed.

Differentiating equation 6 with respect to A and setting the result equal to zero, yields the first order condition that characterizes the level of A which maximizes this individual's utility given his diffuse fiscal expectations.

$$U^e = \int_0^{Y/t} \int_0^{(Y-tG)/t} (U_A - U_B)(t^2/Y(Y-tG)) dH dG = 0 \quad (7)$$

Current consumption, A , will be such that the *expected* (or average) marginal utility from current consumption over the range of possible values of government services G and H equals the expected marginal utility of future consumption B . The implicit function theorem implies that the solution to equation 7 can be written as a function of the other choice parameters. Denote A'' as the solution to equation 7.

$$A'' = a''(t, Y) \tag{7.1}$$

The expected utility of continued fiscal ignorance is equation 6 evaluated at A'' .

Knowledge of the expected utility of plans made in the completely ignorant and completely informed cases allows the expected net advantage of perfect information to be assessed. Let $2C$ be the cost of perfect information about H and G .¹⁰ Prior to obtaining the information, the range of possible values of G and H is the same as in the uninformed case developed above in equation 6. The possibility of purchasing information does not alter one's initial uncertainty about G and H .¹¹ After purchase of the information, concrete consumption commitments can be made for both private goods according to a variant of plan A^* developed in equation 4. Once fully informed, consumption of private good A can be set according to plan A^* evaluated at $A^* = a(t,$

¹⁰ C is the price of a single discrete unit of information. The assumption that only discrete units of information can be purchased is consistent with models of information based on Shannon and Weaver's (1949) concept of informational quanta, the bit. However, all that is required here is the existence of some minimal fixed cost for acquiring and processing information. This would be the case for an information acquisition process that requires one to *redirect and focus* ones attention on the matter of interest before absorbing any new information in as much as this implies a minimum informational opportunity cost.

¹¹ It would be more precise to say that knowledge that perfect information is available for purchase is itself valuable information. The potential purchaser of such information knows that the details of interest are knowable. The availability of perfect information is a simplifying assumption for the purposes of this paper rather than a topic of analysis itself.

$Y - 2C$, G , H) and consumption of good B set to $B^* = Y - A^* - t(G+H) - 2C$, according to the values of G and H revealed.

The *ex ante* expected utility associated with acquiring perfect information is equation 5 evaluated at A^* with a personal budget constraint equal to $Y - 2C$.

$$U^e = \int_0^{Y/t} \int_0^{(Y-tG)/t} U(A^*, Y - A^* - t(G + H) - 2C, G, H) (t^2/Y(Y-tG)) dH dG \quad (8)$$

The relative sizes of equation 6 evaluated at A'' and equation 8 determine whether perfect information is worth its cost or not.

Perfect and costless information always allows one to make plans that are at least as good as those of the uninformed case. The utility level associated with A'' for various combinations of H and G can be no greater than that associated with A^* as long as both A and B are goods in the usual economic sense. This conclusion applies to expected utility as well, inasmuch as the ranges of integration are identical. A'' is adopted whatever the actual levels of H and G . Under plan A^* , A and B maximize realized utility for each specific combination of public service levels.

However, perfect information may not be worth its cost. As the cost of information increases, the expected utility associated with plans based on A^* now evaluated at the original income less $2C$, declines and eventually falls below that of the original fiscal ignorance case. To take an extreme case, the cost of information may be prohibitive in the sense that its purchase would require reducing current and future consumption levels to zero. In this case, there would be no possibility of using information about government service levels or taxes to improve one's planned consumption of private goods.

III. Intermediate Levels of Fiscal Illusion

Rather than choosing to be perfectly informed about fiscal matters, individuals may choose to be informed about a subset of fiscal variables. In the context of the model, this is a matter of whether the expected utility levels associated with knowing G , H or T exceed those associated with complete fiscal knowledge and continued rational ignorance of these parameters. Purchasing information about a single fiscal variable reduces, but does not eliminate, uncertainty about marginal rates of substitution, since these depend on the service levels of all goods.¹²

Consider the purchase of information about government service level G . Knowing that service level $G=Go$ implies that the tax burden faced will not be less than tGo and no greater than Y . Consequently, service level H necessarily falls between 0 and $(Y-tGo)/t$. Knowledge of service level $G=Go$, thus implies diffuse priors, $f(H|Go) = t/(Y-tGo)$, over H between the minimum service level, 0, and the maximum possible given the institutional arrangements, $(Y-tGo)/t$.

Let C be the cost of obtaining information about service level G . The expected utility associated with learning that $G = Go$ is:

$$U^e = \int_0^{(Y-tGo)/t} U(A, Y - A - t(Go + H) - C, Go, H) \frac{t}{(Y-tGo)} dH \quad (9.0)$$

Denote as A^G , the utility maximizing level of private good A obtained by differentiating equation 9 with respect to A and finding the consumption level of A which sets the result equal to zero.

$$A^G = a^H(t, Y, G) \quad (9.1)$$

¹² The fiscal budget constraint implies that information about any two of the unknown fiscal parameters, T , G , and H , implies a value for the third.

Note that plan A^G differs from the complete ignorance plan, A'' , because its value changes according to the value of G rather than being fixed for all G and H . It differs from plan A^* in that it is fixed with respect to values of H . Prior to obtaining information about G , the range of possible service levels that may be revealed by the information is the same as the range of service levels in the original complete uncertainty case. Consequently, the expected utility of information about service level G may be obtained by replacing contingent plan A^G for A^* in equation 8.

$$U^e = \int_0^{Y/t} \int_0^{(Y-tG)/t} U(A^G, Y - A^G - t(G+H) - C, G, H) (t^2/Y(Y-tH)) dH dG \quad (10)$$

In the costless information case, the utility level associated with plan A^G can be no lower than that associated with plan A'' and no greater than that associated with plan A^* . Here, the expected utility of obtaining information about service level G tends to fall between the perfectly informed and original uninformed cases. As information cost, C , increases, the value of plans A^* and A^G diminish. An intermediate levels of fiscal ignorance will be chosen in the range where the expected utility of plan A^G exceeds that associated with plans A^* and A'' as characterized above.

Two other intermediate plans are possible. Plan A^H is based on knowledge of service level H . Plan A^T is based on information about tax burden T . Knowledge of service level $H=H_0$ implies defuse priors, $f(G|H_0) = t/(Y-tH_0)$, over G , and expected utility:

$$U^e = \int_0^{(Y-tH_0)/t} U(A, Y - A - tH_0 - t(G+H) - C, G, H_0) (t/(Y-tH_0)) dG. \quad (11.0)$$

Differentiating equation 11 with respect to A and finding the level of A which sets the result equal to zero allows us to characterize plan A^H , which characterizes consumption levels of A according to the values of H revealed by the fiscal information.

$$A^H = a^H(t, Y, H) \quad (11.1)$$

Ex ante, the expected utility associated with knowledge of service level H can be determined by substituting A^H into equation 8 as previously done for A^G , and integrating with respect to G and for H.

$$U^e = \int_0^{Y/t} \int_0^{(Y-tH)/t} U(A^H, Y - A^H - t(G + H) - C, G, H)(t^2/Y(Y-tH)) dG dH \quad (12)$$

Alternatively, an individual might invest to learn his precise tax burden, T. Tax information allows an individual to know his private budget constraint but leaves the marginal utility of private consumption goods unknown if government services are complements or substitutes for the private goods. Knowledge of tax burden, $T=T_0$, implies diffuse priors over government service levels within the bounds of public revenues, $f(G|T_0) = t/T_0$, and an expected utility of:

$$U^e = \int_0^{T_0/t} U(A^*, Y - A^* - T_0 - C, G, T_0/t - G)(t/T_0) dG \quad (13.0)$$

Under this plan, levels for both private goods can be set with complete certainty, although the optimal mix remains uncertain insofar as these depend upon actual service levels of G and H. Differentiating equation 13 with respect to A and setting the result equal to zero allows one to characterize the optimal consumption level of A for given tax information, denoted as A^T .

$$A^T = a^T(t, Y, T) \quad (13.1)$$

The expected value of tax information is obtained by substituting A^T into equation 13 and integrating the result with respect to T over the range of possible tax levels, here

from 0 to Y. Diffuse priors over the range of possible tax burdens implies a probability density equal to $1/Y$ within the relevant range and an expected utility equal to:

$$U^e = \int_0^Y \int_0^{T/t} U(A^T, Y - A^T - T - C, G, T/t - G)(t/YT) dG dT \quad (14)$$

The relative value of different kinds of fiscal information is a matter of the expected utility levels associated with plans A^G , A^H , and A^T , as developed above in equations 10, 12, and 14. These equations characterize the value of the *expected best use* to which knowledge of an initially unknown value of G, H, or T can be put. This depends on the extent to which the marginal rates of substitution between private consumption and public services are affected by the cost and composition of public services.

IV. Properties of Fiscal Illusion

Proposition 1, *the rationality of rational ignorance*: given specific values for personal income Y, and cost share t, individuals can rank the value of specific fiscal information according to expected utility levels.

Demonstration: individuals know their own utility functions and therefore if the integrals exit for equations 8, 10, 12 and 14, individuals can calculate expected value levels for the various facts that might be obtained. The expected utility levels are real numbers which can be ordered according to magnitude.

Proposition 1 implies that it is possible to make rational assessments of the expected value of bits of fiscal information even in cases where little, *ex ante* is known about the particulars of the information that will be acquired. Rational ignorance is completely compatible with conventional models of self-interested individual behavior.¹³

¹³ Note that this is not true of matters over which one is naturally ignorant. Here the conventional Bayesian representation of learning as a process of amending priors breaks down.

Proposition 2, *pecuniary interests*: individuals with a personal economic interest in particular sorts of fiscal knowledge will never be less well informed than otherwise similar individuals without a pecuniary interest in the fiscal information.

Demonstration: note that a direct pecuniary interest in fiscal information implies that income increases as information is acquired. Since, greater income implies greater utility levels, the expected utility associated with a particular bit of knowledge will be higher for those who realize a direct pecuniary benefit than for those who receive only a planning benefit, if U is monotone increasing in A , B , G , and H . That is to say, if relevant public and private services are goods in the usual sense, then:

$$U(A, Y_2 - A - C - t(G+H), G, H) > \\ U(A, Y_1 - A - C - t(G+H), G, H) \text{ for } Y_2 > Y_1.$$

Since the expected value of being well-informed on fiscal matters is simply the average of the range of the utility levels that might be realized, it follows that the expected value of information about service level G is greater for an individual who receives income Y_2 contingent on knowing G than for otherwise similar people who receive only Y_1 .

Proposition 2 implies that members of economic interest groups tend to be better informed about personally relevant fiscal parameters than otherwise similar individuals who lack a direct pecuniary interest. It bears noting that a pecuniary interest in fiscal (and regulatory) details extends beyond those individuals who directly deal in fiscal information such as lobbyists and tax accountants. Individuals within firms or agencies with interests at risk are often well advised to keep up on relevant fiscal details because

Because the dimensionality of the underlying information space is unknown, no rational expected value calculus over the value of what might be known is possible. Priors over the value of a generalized *activity of learning* may allow a rational calculus to be applied to the process of discovering the personally unknown, but this method is not based on the value of particular kinds of information, but rather the utility of past instances of learning.

being well informed on matters of interest to "the firm" increases their intra-firm productivity and thereby their salaries.

Proposition 3, *the existence of rational ignorance is sufficient condition for the existence of fiscal illusion.*

Demonstration: rational ignorance occurs whenever the cost of perfect fiscal information, $2C$, is such that equation 8 yields a smaller expected utility than equation 6 evaluated at A , or the cost of partial knowledge, C , is such that equation 8 yields a smaller utility level than equations 10, 12, and 14. In this case, the expected utility associated with perfect fiscal information is below that of some feasible level of rational ignorance, and an expected utility maximizing individuals will choose to be rationally ignorant. Rational ignorance generates fiscal illusion whenever a bounded diffuse prior estimator of fiscal parameters is a biased estimator. Note that a diffuse prior estimator over a fixed interval always yields the same estimate regardless of the actual value of fiscal parameters, e.g. the mid-point of the interval over which the uniform distribution is defined. Since the intervals over which diffuse priors are defined are not affected by the actual level of the services or taxes to be estimated, it follows that diffuse priors are not an unbiased estimator of service levels or tax burdens.

It bears noting that, although I have used the conventional Bayesian approach to simplify the analysis, this conclusion is not dependent on the use of a uniform distribution of priors.¹⁴ *Any prior distribution* conditioned only on the boundaries of the

¹⁴ One possible exception to this proposition might appear to be the case where actual fiscal policies are, for what ever reason, generated by the same stochastic process as the individual's prior distribution. For example, one could imagine a collective choice process whereby service levels are determined by rolling dice subject to the budget constraint. Purely stochastic processes of fiscal choice are ruled out here by the assumption that it is possible to know future service levels in the current period. With a less extreme assumption about what is knowable, bias would be assured as long as expected service levels are conditioned on other political or economic variables in addition to the fiscal budget constraint.

fiscal set would share this property. The expected value of such distributions is independent of the actual (or expected) value of the fiscal parameter of interest, and hence is not an unbiased estimator of that fiscal parameter. In this case, rational ignorance implies that it would be *irrational* to assemble and process the informational base necessary for uniformly "rational" expectations.

Proposition 4, *Rational ignorance in elections*: other things being equal, if there is any uncertainty over whether candidates may be elected, individuals will have less interest in the positions of political candidates before an election than those of successful candidates after an election.¹⁵

Demonstration: note that a candidate's unknown policy positions embody electoral uncertainty as well as fiscal uncertainty prior to the election. Voters are uncertain about whether the candidate's platform will in fact be adopted, as well as the details and effects of a candidate's espoused positions. Consequently, the expected utility of information about a candidate's position is weighted by the probability of electoral victory and eventual legislative success. This implies that pre-election information is less valuable than post election information, other things being equal.

For example, suppose that one is considering learning a candidates' unknown position on government service level G . The value of this information would be that characterized in equation 10 if one knew with certainty that this candidate would be elected and enact his espoused policy. However, if one is not certain about which candidate will win the election, the expected value of information about one candidate is the extent to which one's plans can be improved given the electoral uncertainty.

The expected utility of a two candidate-election is:

¹⁵ Note that this proposition implies that in a series of elections, incumbent positions will be better known than challenger positions. Given risk averse voters, this provides an explanation for the incumbent advantage reported in the empirical elections literature.

$$U^e = P U_1^e + (1-P) U_2^e \quad (15)$$

where P is the probability that the candidate of interest gets elected and implements the fiscal policies espoused during the campaign and $(1-P)$ is the probability that the other candidate wins. The expected utility of candidates 1 and two are denoted as U_1^e and U_2^e respectively.

The value of information about candidate 1's position is the extent to which the expected value of the election can be improved by that knowledge. Given previous work on elections which demonstrate that a typical voter has a vanishingly small effect on electoral outcomes in large electorates, the effect of acquiring information on the probability of electoral outcome is approximately zero. In this case, the entire effect of electoral information is through its effect on personal consumption plans. Information about candidate 1, thus, increases the expected utility of the election by P times the change U_1^e generated by the information. Let U_1'' be the expected utility associated with the original fiscal ignorance situation, and U_1^G be the expected utility associated with the plan based on knowing candidate 1's position on G . In the case where $U_1'' > U_1^G$, the expected value of information about candidate 1's position on G is less than that of remaining ignorant, and information about candidate 1's fiscal position will not be acquired either before or after the election. In the case where $U_1^G > U_1''$, the expected value of being informed about candidate 1's position, PU_1^G , which falls between that of continued rational ignorance on this matter and that where the candidate is certain to be elected, U_1^G . Consequently, the advantage of learning a candidate's unknown fiscal position before an election *is below* that associated with learning which fiscal policies are actually adopted after the election takes place.¹⁶

¹⁶ An implication of this result, is that a typical voter tends to know more about an incumbent's fiscal policies than about the challengers. This is one source of incumbent advantage in elections. See Congleton (1986) or Banaian and Luksetich (1991).

Proposition 5, *subjectivity*, an informed external observer cannot generally deduce the value of fiscal knowledge to an individual without substantial information about the individual's utility function—even if the external observer knows the individual's income and cost share, Y and t . The value of fiscal information depends on the extent to which personal consumption plans can be improved by such information as well as the direction of the bias in expectations based on incomplete information. These cannot be appraised without substantial knowledge of the geometry of an individual's utility function.

Demonstration: It is sufficient to show that ambiguity exists in at least one case. For purposes of illustration, suppose that actual expenditures on H equal that on G , so $G_0 = H_0$. In addition, assume that the ideal expenditure levels of H and G for the ignorant individual in question are not the same. This implies that the marginal utility of H differs from that of G at the actual service levels for the individual at issue. Let $U_G < U_H$ at $H = G$. The expected utility associated with knowing G_0 or H_0 is the average utility over the range of values of the other unknown values service level. With H_0 known, one evaluates expected utility levels for unknown levels of G , given private consumption level $A^H = a^H(G, H_0, Y, t)$. With G_0 known, one averages utility levels across unknown levels of H , given private consumption level $A^G = a^G(G_0, H, Y, t)$. This implies a range of utilities like those depicted in figure 1 for various combinations of G and H_0 , and G_0 and H .

From equation 9, the expected utility associated with knowing G is $t/(Y-tG_0)$ times the area under the curve denoted $U(A^G, B, G_0, H)$, the average height of the utility function over the range of possible levels of service H . From equation 10, the expected utility associated with knowing H is $t/(Y-tH_0)$ times the area under the curve $U(A^H, B, G, H_0)$. Since H_0 equals G_0 by assumption, the relative size of the areas under the respective curves determines the relative size of the two expected utility levels.

This is a matter of the relative sizes of areas I and II which cannot be determined without knowing specific functions for the derivatives of U.

Proposition 5 implies that an external observer cannot generally determine exactly what kind of information a particular individual will benefit most from unless fairly detailed knowledge of an individual's tastes for government services and economic interests are available. Whether an individual's expected utility increases more by knowing T, G or H depends, in part, on the degree of individual risk aversion, in part on the extent to which the information will allow one to improve one's pattern of private consumption, that is to say complement and substitution relations between public and private services, and in part by the *direction of bias* generated by expectations without such knowledge. Note that expected utility does not necessarily increase if an individual becomes well informed on matters of great personal interest (high marginal utility) because such knowledge may not allow personal plans to be substantially improved or may reduce expected utility because previous estimates had been biased upward.

V. Elections with Rational Ignorance

The above analysis implies that individuals generally have a weaker incentive to understand the fiscal positions of candidates before an election than after it. Since rational ignorance on fiscal matters implies fiscal illusion, voters will rank candidates on the basis of expected utility levels which are not completely unbiased. Together, these results imply that a voter's ranking of fiscal candidates is more likely to be affected by fiscal illusion than are his private plans. Thus, in contrast to Wittman's (1989) claim that public and private decisions are essentially equally efficient, the analysis above implies that public plans are based upon less complete information than private plans are. In this section of the paper, the extent to which such voter misperceptions might affect electoral outcomes is explored.

There are two reasons to expect that electoral results will be less affected by fiscal illusion than the previous analysis might suggest. First, political candidates have incentives to reduce voter ignorance of their own positions. They, consequently, subsidize various kinds of information, by for example, distributing brochures and sponsoring television advertisements, although they can not generally reduce information costs to zero. Second, electoral outcomes tend to be decided by relatively informed voters, since these are the only voters who take direct account of candidate positions when casting their votes. However, neither of these moderating properties of electoral politics is sufficient to eliminate the effects of fiscal illusion.

Political candidates only have an interest in reducing the cost of information which increases the expected value of their policies relative to their opponents. They have no general interest in reducing any upwardly biased expectations that partly informed voters may have about their own policies, or in eliminating any downward biased estimates that voters may have for the policies of their opponents. (Candidates would, in fact, prefer to induce a downward bias in the expected utility associated with their opponents electoral success.) Candidates do have an interest in disabusing voters of any upwardly biased evaluations of their political opponents, but in general have little to gain from subsidizing the dissemination of unbiased fiscal information.

Moreover, proposition 5, implies that candidate efforts to manipulate information costs to maximize their chances of electoral success will be highly imperfect. However, even given this, proposition 2 suggests that candidates will find it less costly to get particular policy positions across to groups with more or less easily identified and homogeneous economic interests. Consequently, one expects candidates to target policy messages at groups with an economic interest in particular policies rather than to broadly disseminate their positions on all issues.

To see why the effects of fiscal illusion tend to remain in elections where relatively informed candidates determine electoral outcomes and thereby fiscal policies, consider an election between two candidates in an electorate composed of three groups of voters. Returning to the model, assume that members of two of the groups have sufficient pecuniary interest in particular service areas to have become informed on candidate policies in an area of concern. Designate as Group h the group interested in service level H , and Group g as the group interested in service level G . Assume that the third group lacks sufficient interest in either service level G or H to warrant acquiring fiscal information regarding either policy dimension, and therefore remains rationally ignorant of candidate positions on service levels G and H .

A voter from Group h evaluates the candidates based on information about candidate positions along dimension H and according to expectations about their position in dimension G . This yields an expression for expected utility similar to that of equation 12 above, except that case two units, rather than one, of fiscal information have been acquired, one for each candidate. Let H_0 denote the position regarding service level H taken by the candidate of interest.

$$U^e = \int_0^{(Y-tH_0)/t} U(A^H, Y - A^H - t(G+H) - 2C, G, H_0)(t/(Y-tH_0)) dG \quad (16)$$

In equilibrium, vote maximizing candidates will adopt the position that is most attractive to the median member in the H policy domain. Since other voters are uninformed about candidate positions in this policy subspace, their opinions on policy H are largely irrelevant for candidates because policy stances on these matters remain unknown to voters in these groups and therefore do not generate any votes.

The third group of voters could be informed on other issues. What matters for the purposes of this illustration is that whatever other information they might possess does not shed any light on candidate positions in this domain.

The same sort of equilibrium exists for policy G. Let G^{**} denote the ideal service level for the median member of Group g, and H^{**} denote that of the median member of Group h. The opinions of members of the third completely ignorant group do not affect candidate positions in the GxH policy domain because candidate positions in this policy space remain unknown to them. Candidate incentives to take explicit positions in the GxH policy domain are entirely the result of the informed preferences of Group h and g members.

Figure 2 illustrates the geometry of this electoral equilibrium. The vertical lines represent expected utility levels for the median member of Group g. The line at G^{**} represents the expected utility maximum for the median member of Group g, given his expectations about policy H which are not affected by the actual positions taken by candidates in this dimension. The horizontal lines represent expected utility levels associated with alternative service levels for the median member of Group h. H^{**} is the ridge line, or expected utility maximum, for the median member of Group h given his expectations about policy G. Rational ignorance implies that each of these groups effectively views the election as taking place within a *single issue* space, G or H respectively. And, consequently median voter equilibria exist for each dimension. Candidates who locate nearest to H^{**} will receive the votes of a majority of the members of H. The candidate who locates closest to position G^{**} , will receive the majority of the votes cast by group g. In this case, the electoral equilibrium in the GxH domain is determined by the votes cast by the informed groups and occurs at the point where the lines representing G^{**} and H^{**} intersect.¹⁸ Note that this implies that the

¹⁸ Uninformed voters may vote on the basis of non-policy specific candidate characteristics of candidates such as personality, region, or party affiliation. As long as these are *ex ante orthogonal* to their positions here, such information about candidates will be insufficient to inform voters of candidate positions in the GxH plane. In this case, the votes of the uninformed group are distributed uniformly among the candidates. Note that vote maximizing candidates will have an interest in maximizing votes from the informed by taking appropriate positions in the GxH

median voters of each informed group of voters get exactly what they want. *Knowledgeable voters rather than uninformed voters determine electoral results* in such elections.¹⁹

On the other hand, since each group of informed voters is only narrowly informed about the issues, their preferred service levels are not those that would have been chosen in a fully informed setting. Diffuse priors over the other fiscal variables implies that accurate forecasts of unknown aspects of candidate positions would be accidental. In general, diffuse priors may imply either upwardly or downwardly biased expectations of service and tax levels. Let G^e and H^e be the expected values of service G and H for the median member of Groups h and g respectively. In the case depicted, Group g has over estimated the level of service H , $H^e > H_0$; and Group h has under estimated the level of service G , $G^e < G_0$. These fiscal illusions imply that the combination of public services provided differ from that which would have been chosen given complete information (or unbiased estimates).

Although this electoral outcome is determined by informed voters with unbiased estimates of the policies of personal interest, the effects of fiscal illusion remain in evidence. For example, if service levels of G and H are complements for members of the two groups, Group g would have preferred a smaller level of G had they accurately forecast H , and Group h would have preferred a larger level of H had they correctly forecast service level G .

Voters in each group would have opted for different public service levels in their area of interest had they known the actual service levels provided in other areas. This is true even though the results of the equilibrium illustrated are *ex ante* Pareto efficient. Any change in service levels would make members of one of the groups worse off, given their

policy space even if the overwhelming majority of the electorate remains uninformed about candidate positions in the $G \times H$ domain.

¹⁹ These are likely to be members of economic special interest groups, as discussed above under proposition 2.

expectations about service levels.²⁰

VI. Conclusion

This paper has demonstrated that rational ignorance can be an expected utility maximizing strategy even in cases where perfect information is available at a modest cost. Given information costs, it may not be rational in the usual microeconomic sense to acquire sufficient information to make unbiased estimates of all fiscal parameters. One implication of rational ignorance is fiscal illusion. Individuals may have rational expectations over fiscal matters of particular interest, but fiscal illusion occurs as a consequence of the biased expectations engendered by areas of ignorance that remain.

On the other hand, the analysis suggests that fiscal policies in a democracy are based on better than the average information possessed by voters, and therefore are more responsive to informed voter concerns than one would imagine based on the level of fiscal ignorance reported in surveys.²¹ The implied electoral outcomes differ somewhat from the usual voting models insofar as the voters with the greatest incentive to acquire

²⁰ This is a consequence of the single issue voting that resulted from rational ignorance in the case examined. In cases where groups are heterogeneous, and interested in more than one dimension the usual indeterminacy of spatial voting model will obtain unless Plott (1967) symmetry conditions hold. The model can be recast in a stochastic choice framework to generate *ex ante* results similar to those of Mueller, McGuire, and Coughlin (1990), and yet be *ex post* inefficient because of the effects of fiscal illusion.

It bears noting that the addition of a fourth completely informed group does not necessarily affect the electoral outcome. Unless this informed group is large or includes the pivotal voter of each of the two special interest groups, candidates will still generally maximize votes by catering to the partially informed pivotal members of the two interest groups.

²¹ The results also suggest that models of policy formation which focus on one or two fiscal services rather than entire fiscal menu have better micro-economic foundations than might have been thought. If voters are well informed about only a small subset of the issues before them, then policy selections in many areas will be essentially orthogonal to one another.

fiscal information tend to be those with a personal pecuniary stake in the policies at issue rather than those with ordinary demands for public goods. In this manner, fiscal illusion potentially allows economic interest groups to directly capture the electoral process without organized efforts or implicit bargains struck over the provision of campaign contributions.²²

However, ignorance of other relevant policy areas implies that a voter's expressed policy preferences differs from those which actually maximizes utility. In the model developed above, policies reflect accurate information, in the sense that only well informed voters ranked candidates in the GxH policy domain, yet the policies espoused were affected by the inaccurate estimates of marginal rates of substitution between private and governmental services engendered by rational ignorance. The electoral illustration implies that even in cases where policy choices reflect the informed choices of voters, the effects of fiscal illusion remain. In contrast to Wittman's (1989) discussion, the analysis suggests that private decisions will be based upon better fiscal information than public ones insofar as incentives to master fiscal details are greater after an election than before it.

All in all, the analysis has shown that the existence of fiscal illusion is perfectly consistent with rational decisions to acquire and analyze information. Individuals have been assumed to make the very best use possible of the information possessed by them. Yet expectations over events and utility levels never-the-less may be biased. A brief reflection on the many years of work invested by Public Finance specialists to appraise tax burdens and the cost of public funds (see for example Browning (1976, 1987)) makes it clear that the cost of fiscal information is far from trivial. Personal incentives to be well informed for its own sake, for planning purposes, or for pecuniary advantage, are

²² The existence of rational ignorance would also seem to allow candidates considerable discretion on policy matters at the periphery of voter knowledge, and consequently a role for pure special interest group politics.

not likely to warrant complete knowledge of fiscal details by even highly motivated voters. Thus, rational ignorance and fiscal illusion are likely to afflict fiscal policies for the foreseeable future.

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Figure 1

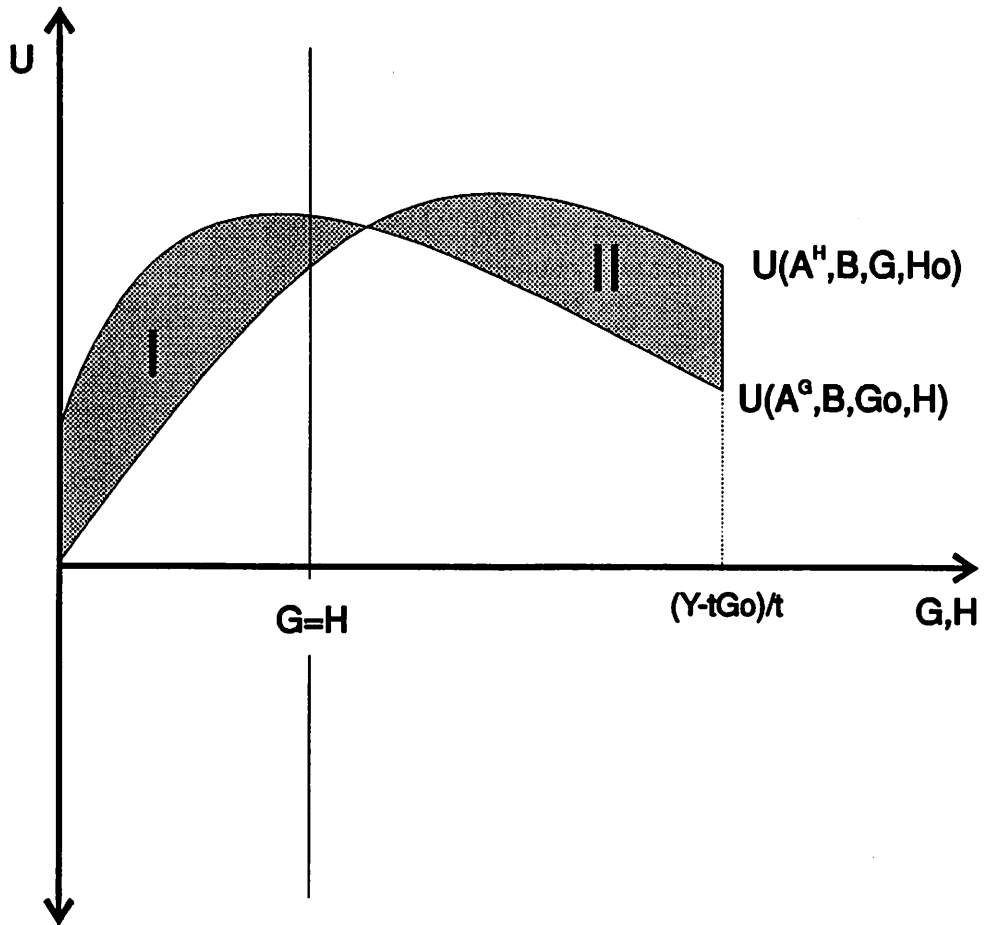


Figure 2

