Indirect Tax Misperceptions and Direct Tax Policy Making in a Probabilistic Voting Framework

Young Hwan Lee[*]·Sung Kyu Lee[**]

Abstract

We examine the effect of indirect tax misperception on direct tax policy making in a more general probabilistic voting framework. In a representative democracy, candidates are thought to be judged by voters on the basis of both policy and non-policy or random policy characteristics in voters' voting decision. We include misperceived indirect tax levels as a random policy variable which is separate from direct tax policy. We suppose that direct tax and indirect taxes are separate in relation, and voters have asymmetric perception about direct tax and indirect tax policies proposed by candidates. Thus, voters may have misperception, or inaccurate perception, of the indirect taxes because of its invisibility. By employ 'probabilistic linkage' between direct tax and indirect tax policies, we first examine the effect of indirect tax misperception on direct tax policy making in a general probabilistic voting framework. Then, we extend to include the tax administration cost, and examine its effects on the political opposition from direct taxation.

 * National Assembly Budget Office, young7@nabo.go.kr
** (corresponding author) National Assembly Budget Office, skl62@paran.com

I. Introduction

In a representative democracy, candidates are generally thought to be judged by voters on the basis of both proposed 'policy' and 'non-policy characteristics'. This implies that candidates are something more than simply policy surrogates. That is, in addition to policy platforms, candidates have non-policy characteristics which are important in voters' voting decision. In contrast, in a direct democracy, only policies matter in voter choices.

Direct tax policies, like income tax, are easily observable and very salient in an election, suggesting that voters can exercise substantial control over these policies. In contrast, indirect tax policies involve innumerable details that would require time and expertise to judge well. As a result, these indirect tax levels are often misperceived by voters. Thus, we will start with the idea that direct tax and indirect tax are separate in the sense that voters perceive them as distinct policies, and thus that voters have asymmetric perceptions about direct tax and indirect tax policies proposed by candidates. That is, direct tax policy is visible and directly observed by voters, while indirect tax policy is less visible and hidden to the voters. As a consequence, indirect tax policy is often related to the voters' perceptions, and so voters tend to have misperceptions, or at least inaccurate perception, of the indirect tax levels proposed by political parties.

Like most of the standard spatial election models, Hettich and Winer(1988, 1997) suppose that voters care only about policy platforms announced by the two candidates. However, candidates or parties may also differ in some other dimension unrelated to the policy issue. This is usually referred to as 'non policy characteristics or attributes' of candidates which include ideology or party identification, candidates' personal characteristics, race or religion, policy illusion and so on. In particular, Enelow et al.(1986) examined the relevance of non-policy candidate characteristics in their empirical voting model, and showed that the model including both policy and non policy variables is better in predicting voter choices than models excluding non policy variables.

Instead of employing the concept of non-policy characteristics, we will include what might be termed a misperceived policy attributes which depends on the voters' perceptions. We incorporate the 'misperceived policy characteristics'

into a probabilistic voting model. More specifically, we construct a model incorporating the candidate uncertainty regarding voters' misperceived policy preferences into a probabilistic voting framework. In addition, our model is based on a general probabilistic voting model in the sense that both voters and candidates face uncertainties: candidates have uncertainty about voters' choices and voters have uncertainty about candidates' indirect tax policies.

Probabilistic voting model works as follows. Each candidate seeks to maximize his expected numbers of votes, which is a function of both the measurable difference in policy-related utilities between two candidates and the distribution of an unobserved variable. This unobservable variable represents the non-policy or random policy attributes of candidates. While Enelow and Hinich(1982, 1989) and Lindbeck and Weibull(1987) include non-policy attributes in their probabilistic voting model, we include the qualitative policy element in the voter's assessment which is defined as the misperceived indirect tax policy by voters. In our model, differences in the misperceived indirect taxes are treated by candidates as random variables which are independent of direct tax policy issues.

In this study, we aim to examine the probabilistic linkage of indirect tax misperception to direct tax policy making. Indirect taxes are hidden or less visible, and thus, voters are not aware of the indirect tax levels. By contrast, direct taxes are direct and more visible to voters. Thus, the relation between direct tax and indirect tax is separated and asymmetric. Thus, to connect these two variables and to examine the effect of indirect tax misperception on direct tax policy making, we employ 'probabilistic linkage' between direct tax and indirect tax policy. This linkage is achieved by assigning a probability distribution to the differential in indirect tax misperception between candidates or parties. In short, this is a probabilistic mechanism connecting perceived direct tax and misperceived indirect tax.

We will focus on the candidates' selection of direct tax policy, but differences in voters' misperceptions concerning the less visible indirect taxes may have a significant effect on the outcome of direct tax policy making, and on candidate competition for votes. In section II, we assume the separation and asymmetric perception relations between direct tax and indirect tax, and then, in section 3,

we introduce a basic model based on a general probabilistic voting framework. In particular, we assume that voters judge the candidates both on the basis of direct tax policy and misperceived indirect tax, and incorporate both direct tax policy and misperceived indirect tax policy issues into the voters' utility function. After showing the effect of misperceived indirect tax policy on the direct tax policy making, then we characterize the political equilibrium direct tax structure with and without candidate bias considering. In addition, we examine the effect of candidate bias on the political opposition and voter differentiation. Finally, we explain the politics of indirect taxes and the tax connection between direct and indirect taxes.

In section IV, we extend the basic model to examine the effects on tax administration costs. In section V, we summarize main results we have examined.

II. Indirect Tax Misperception and Probabilistic Voting Framework

Before introducing the model formally, we will explain briefly the policy features, general probabilistic voting and probabilistic linkage.

First, we will consider the following two important policy features related to the direct tax and indirect tax policy : that is, there are separation relation and asymmetric perception between direct tax and indirect tax. First, we assume a policy separation between two policy variables: that is, there exists a separation relation between direct tax and indirect tax policies. Second, we suppose an asymmetry in policy perception (i.e., voters have an asymmetry in policy perception): that is, there is an asymmetric policy perception from voters between direct tax and indirect tax. As described, indirect tax levels are often hidden, obscure or less visible to voters, whereas direct taxes are direct or visible. Thus, voters perceive direct tax policy accurately, but misperceive indirect tax levels. In particular, an asymmetric policy perception between direct tax and indirect tax prevents voters from connecting direct tax to indirect taxes. In summary, indirect tax levels are less visible in character compared with

direct taxes. When voters are either 'rationally ignorant' or suffer 'indirect tax illusion', they fail to realize the indirect tax levels that they are paying. However, they are well aware of the direct taxes they pay. These two assumptions are useful to analyze our probabilistic linkage model between direct tax and indirect tax. The separation assumption will help us analyze a unidimensional policy which most of probabilistic voting models assume. In addition, the asymmetric perception assumption will serve to analyze our model in a probabilistic framework.

Second, we will base our model on the general probabilistic voting framework. There are always unobservable variables that affect voters' voting choice. Furthermore, policy issues or positions of candidates are measured with error by voters. We will consider uncertainties of both candidates and voters. First, the voter's uncertainty about the candidates may arise from several sources. Candidates' policy proposals may be imperfectly perceived by voters or may be perceived as a random variable[1]. Second, a candidate may face the uncertainty of never knowing all the factors that affect voters' voting decisions. Even when voters are rational, informed, and have clearly defined views on policy issues, the candidate still cannot be certain about how the votes will be cast. The standard probabilistic voting models take only the candidate uncertainty into account.

Both considerations suggest the need for a general probabilistic voting framework which incorporates the two essential uncertainties that candidates have about voters' choices and voters have about candidates' policies. Thus, we construct a general probabilistic voting model[2]. Each candidate seeks to maximize his expected vote, which is a function of both the measurable difference in policy-related utilities between two candidates and the distribution of an unobserved variable. This unobservable variable may represent the

---

[1] Alternatively, uncertainty about new issues and future events may also complicate the voter's decision problem. A voter who is future-oriented may face this inescapable uncertainty, even if he is confident that he knows the candidates' policies on current policy issues.

[2] This concept was originally developed by Enelow(1989) It is based on the behaviorally reasonable voting theory of two-candidate competition which is designed to reflect electoral uncertainties by both voters and candidates.

difference in non-policy or random policy attributes between two candidates and is distributed independently of policy difference. As in Enelow and Hinich(1982, 1989) and Lindbeck and Weibull(1987), we include the difference in the misperceived indirect tax policy that is treated as a random variable and independent of direct tax policy. This random element serves to represent factors which are probabilistically modeled.

We suppose that political parties or candidates have their own policy programs, and that parties' policy programs may consist of direct tax policy and indirect tax policy. We will treat direct tax policy as a deterministic choice variable by candidates and indirect tax policy as a random variable : the former is visible and direct to the voters, while the latter is less visible and hidden to the voters, and so voters may have misperception of the indirect tax levels proposed by political parties[3]. We focus on the candidates' selection of direct tax policy. However, differences in misperceptions between the two candidates with respect to 'less visible indirect tax policy' may have a significant effect on the outcome of direct tax policy making and candidate competition for votes.

Now, we examine 'politics' of indirect taxes based on the less visibility of indirect taxes. For instance, consumption taxes are 'invisible taxes' in which the burden of the tax is hidden in the cost of goods consumed. Whereas voters or taxpayers can observe income tax changes directly, changes in consumption taxes are difficult to isolate from market price fluctuations. Thus, the political value of changes in consumption tax policy is less significant than it is for taxes which directly affect income earned. At the same time, the lower visibility of consumption taxes gives the government a very high revenue value so that when higher tax revenue is required, consumption taxes provide an automatic target for raising revenue. It would be politically rational behavior for the government or parties to use direct taxes for political ends while altering invisible taxes for 'political means' when they need to increase or maintain tax revenue.

There is a theoretical reason why politicians might prefer indirect taxes to direct tax. First, politically, indirect taxes, such as VAT and excise taxes, were

---

[3] In other words, voters have 'complete information' on the tax policy, but have 'incomplete information' on the benefit policy.

widely regarded as much easier to raise it than direct taxes. Second, indirect taxes are 'voluntary', since they are paid only if and when purchases are made. Third, indirect taxes are generally 'less visible' to the individual taxpayer than direct taxes, since they are paid through the price of goods, and thus, the amount is rarely made clear. Where excise duties are concerned, the variation in rates means that most consumers have no idea how much of the price of the good is actually tax. For instance, in the UK, over the past twenty years, this relative invisibility has made indirect taxes attractive for the government seeking to raise extra revenue. With indirect taxes, it is virtually impossible for most people to know how much they are paying in indirect tax. Finally, indirect taxes are essentially 'regressive' in their effect, since they impose more heavily on those who are poor than on the better off.

Finally, we employ probabilistic linkage method by assuming in our model that there is an 'indirect or implicit linkage' between direct tax and indirect tax policy. In particular, we assume that voters have indirect tax misperception which is treated by candidates as a random variable and thus assigned by candidates to a probability distribution. Thus, to examine the effect of indirect tax misperception on direct tax policy making, we employ a 'probabilistic linkage' between direct tax policy and indirect tax misperception. Now, we examine a mechanism connecting well-perceived direct taxes and misperceived indirect taxes implicitly via a probabilistic linkage. Since voters have misperceptions on the indirect taxes, but have accurate perceptions on the direct tax policy, it is reasonable to connect them by means of an implicit and probabilistic linkage.

The relationship between direct taxation and indirect tax can be divided into two extreme trends: that is, there can be complete linkage and complete separation. First, a complete and explicit linkage method connects explicitly direct tax to indirect tax. For instance, an increase in direct tax leads to an increase in indirect tax. Second, there can be a complete separation method. That is, direct taxation is completely independent of indirect taxes, although voters can choose direct tax and indirect tax simultaneously. However, we adopt a compromise method which links indirectly and implicitly direct tax to indirect tax. Thus, we call this an 'implicit or probabilistic linkage method'. This implies

that direct tax and indirect tax are separate, but that direct tax policy is implicitly affected by indirect tax policy which is misperceived by voters.

III. A Basic Model

Now, we turn to build up our model formally. We consider a basic model dealing with two-candidate electoral competition in which policy pronouncements are made in terms of direct tax policies by the two candidate s[4]. Both candidates simultaneously announce their direct tax policy proposals. There are n voters, indexed by $i, i = 1, 2, 3, \cdots n$. Voters all vote sincerely and thus, there is no abstention in voting. Before the election, the two candidates, 1 and 2, will promise direct tax policies, T^1 and T^2 respectively.

First, we describe voters' preferences as follows. A basic idea here is that voters derive utility both from the direct tax policy and from the indirect tax policy that is likely to be misperceived by voters. Thus, one component of every voter's welfare depends on direct tax policy through its effects on his income or utility. This component is known by both candidates and thus represents a deterministic factor. This means that there is complete information concerning the preferences of voters in relation to the visible direct tax policy. The other component of voters' welfare is derived from the misperceived indirect tax in the candidates' programs which is imperfectly observed by the candidates because of its misperception to voters, and so this represents a random or probabilistic factor. This implies that political candidates have incomplete information as to indirect tax misperceptions of voters.

More specifically, each voter i derives utility $U_i(T^c; \tau_i^c)$ from both visible direct tax policies, T^c, and misperceived indirect taxes, τ_i^c, whose differences

---

[4] Note that for the convenience of terminology, we assume throughout the whole section that 'candidates' and 'parties' are interchangeable, 'voters' and 'taxpayers' are also interchangeable. In addition, 'tax policy' and 'tax rate' are interchangeable, 'indirect ta policy' and 'indirect tax level' are interchangeable, and 'indirect tax misperception' and 'indirect ta illusion' are interchangeable.

between candidates serve to reflect a random element in our model. Here, the superscript denotes candidates. That is, each voter i derive indirect utility $V_i(T^c)$ from direct tax policies which are visible to him, and thus we call this 'direct-tax-induced utility'. We assume that $\partial V_i / \partial T^c < 0$ and $\partial^2 V_i / \partial T^c \cdot \partial T^c < 0,\ c = 1, 2.$ The direct-tax-related utility function shows a decreasing utility (or increasing disutility) and increasing marginal utility from direct taxation. Thus, the direct-tax-related utility is assumed to be a concave function in direct tax policy. In addition to this, each voter i obtains utility from indirect taxes which are assumed to be misperceived because of the 'indirect tax illusion' of voters, and thus we call this 'misperceived-indirect-tax-induced utility'. Since we have assumed that direct tax and indirect tax policies are chosen separately and perceived asymmetrically, the utility function can therefore be expressed in an additively separable form[5] :

$$U_i(T^c; \tau_i^c) \quad = \quad V_i(T^c) \ + \ \tau_i^c, \quad c = 1, 2$$

$$\frac{\partial V_i}{\partial T^c} \ < \ 0 \quad \text{and} \quad \frac{\partial^2 V_i}{\partial T^c \cdot \partial T^c} \ < \ 0 \tag{1}$$

Thus, the preferences of voters incorporate voters' misperceived indirect tax policy characteristics into the utility function in addition to the well-perceived direct tax policy. Clearly, this functional form has, in our case, an advantage of expressing a separate relation between direct tax and indirect tax policies. We considered that two candidates compete with direct tax policy: tax policy is a deterministic variable, while indirect tax policy is a random variable. However, we assume there is a separation relation between direct tax and indirect tax policies. In other words, this corresponds to the assumption that voters perceive no connection between direct tax and indirect tax policies. This feature of

---

[5] There are two ways to describe the utility function either in an *additive* form $V_i(T^c) + \phi_i^c$, or in a *multiplicative* form, $V_i(T^c) \cdot \exp(\phi_i^c)$, where ϕ_i^c denotes the non-policy evaluation of voter i on candidate c, c= 1, 2.

separate relation between direct tax and indirect tax can be represented well by the additively separable utility function.

On the other hand, this separate relation implies that voters have asymmetric information on the two policy issues: that is, voters have complete information on direct tax policy, but incomplete information on the indirect tax policy because of illusion or misperception.

Now, the individual voter $i's$ total utility obtained from both deterministic direct tax policy and random indirect tax element is represented as follows, depending on which candidate will win :

$$
\left[
\begin{array}{l}
U_i(T^1;\tau_i^1) = V_i(T^1) + \tau_i^1 \quad \text{if candidate 1 wins} \\[2em]
U_i(T^2;\tau_i^2) = V_i(T^2) + \tau_i^2 \quad \text{if candidate 2 wins}
\end{array}
\right. \qquad (2)
$$

where $V_i(T^1)$ and $V_i(T^2)$ are the individual voter $i's$ indirect utilities derived from the candidate's direct tax policies, T^1 and T^2, respectively. In addition, τ_i^1 and τ_i^2 are the utilities that individual voter i obtains from misperceived indirect tax policy provided by candidates 1 and 2, respectively[6].

Second, from this utility function, we can infer voters' decision rule in the presence of sincere voting. Voters will decide their votes by assessing and comparing the total utilities between the two candidates. Thus, voters' decision in voting depends on the total utility differential between the two candidates. Individual voter i is assumed to vote either for candidate 1 if $U_i(T^1;\tau_i^1) > U_i(T^2;\tau_i^2)$, or for candidate 2 if $U_i(T^1;\tau_i^1) < U_i(T^2;\tau_i^2)$. In this case, voter's choice is deterministic.

Third, we specify the probability for a voter i to vote for a candidate. We focus on the case for candidate 1 for analytical convenience. Then, the

---

[6] In other words, voter utility for a particular candidate's voting is the sum of his utility for the candidate's direct tax policy(i.e., direct-tax-related utility) and an additional component that reflects other policy factor which affect independently his preferences for the candidates (i.e., misperceived indirect-tax-related utility).

probability assignment for an individual voter i to vote for candidate $1, P_i^1$, is represented by the total utility differential between the two candidates :

$$
\begin{aligned}
P_i^1 &= \Pr\{U_i(T^1;\tau_i^1) > U_i(T^2;\tau_i^2)\} \\
&= \Pr\{\left[V_i(T^1) + \tau_i^1 \right] > \left[V_i(T^2) + \tau_i^2 \right]\} \\
&= \Pr\{V_i(T^1) - V_i(T^2) > (\tau_i^2 - \tau_i^1)\}
\end{aligned}
\tag{3}
$$

where $(\tau_i^2 - \tau_i^1)$ represents the 'misperceived indirect tax differentials' of voters between the two candidates.

The differential in indirect tax misperceptions represents voter $i's$ evaluation of misperceived indirect tax differences between candidates 1 and 2. This shows that voters evaluate the misperceived indirect taxes of the two candidates in their probability voting for a candidate. This corresponds to the candidate bias, or candidate preference, since the candidate bias in our context is caused by the indirect tax misperception differentials[7]. For instance, candidate bias means that voters are said to be in favor of candidate 1 if $(\tau_i^2 - \tau_i^1) < 0$[8]. In other words, this indicates that candidate 1 has an advantage over candidate 2 in voter i's choice when $(\tau_i^2 - \tau_i^1) < 0$ even if they have the same direct tax policies. Thus, we may refer to $(\tau_i^2 - \tau_i^1) < 0$ as the expected candidate bias in favor of candidate 1[9]. In addition, when $(\tau_i^2 - \tau_i^1) = 0$, then P_i^1 would reduce to $V_i(T^1) > V_i(T^2)$, and thus voters' choices become deterministic[10]. Note here that the degree of variation of $(\tau_i^2 - \tau_i^1)$ is assumed

---

[7] Note that candidate bias, or candidate preference and misperceived indirect tax bias are all interchangeable.

[8] Here, we define the candidate bias as *misperceived indirect tax difference* between candidates.

[9] Similarly, we can specify $(\tau_i^2 - \tau_i^1) > 0$ as the *expected candidate bias* in favour of candidate 2.

[10] In other words, if the variance of $(\tau_i^2 - \tau_i^1)$ goes toward zero, then the voter choices become deterministic.

not to be zero. From this formulation, we can rewrite the voter i' probability to vote for candidate 1, P_i^1, as :

$$
\begin{aligned}
P_i^1 &= 1 \quad \text{if } \{V_i(T^1) - V_i(T^2) > (\tau_i^2 - \tau_i^1)\} \\
&= 0 \quad \text{otherwise}
\end{aligned}
\tag{4}
$$

But, the probability voting function, P_i^1, is a discontinuous function of the utility differential between the two candidate policies.

Fourth, the problem is 'how to connect the less visible misperceived indirect taxes to the visible direct tax policy making'. We employ the probabilistic linkage method by assigning a probability distribution function to a random element in order to derive a continuous probability voting function. We start with the fact that the candidates cannot observe exactly the misperceived indirect tax terms, τ_i^1 and τ_i^2, because of voters' misperception, or at least can only observe imperfectly. Thus, they will treat 'their differences' as a random variable when selecting their direct tax policies. Thus, both candidates assign a twice continuously differentiable probability distribution function F_i to 'misperceived indirect tax differential', $(\tau_i^2 - \tau_i^1)$, and F_i has a positive density everywhere :

$$
F_i'(\tau_i^2 - \tau_i^1) = f_i(\tau_i^2 - \tau_i^1) > 0
\tag{5}
$$

Note that both candidates are assumed to make the same probability assignments for voters' misperceived indirect taxes: $F_i^1 = F_i^2 \equiv F_i$ 11). This distributional assumption is consistent with assuming that the candidates know the misperceived indirect tax differences for each voter. This is also consistent with assuming that they are uncertain about the value of misperceived indirect taxes for any particular voter, but only know the distribution of the misperceived indirect taxes across voters[12].

---

11) For example, they have access to the same information concerning the candidate preferences distribution in the electorate through opinions polls.

The process of assigning a probability distribution function is as follows. If we define the misperceived indirect tax differentials as $\phi_i \equiv (\tau_i^2 - \tau_i^1)$ and let ϕ_i vary among voters, then we can assign a continuous probability distribution function F_i to the cumulative distribution of ϕ_i. Voters' randomly chosen indirect tax preferences are largely beyond the candidates' immediate control and, in particular, it is not expected to be altered by the direct tax policy that a candidate adopts because of the separation relation between direct tax and indirect tax. Hence, the distribution $F(\phi_i)$ is independent of direct tax policies. Both candidates are assumed to know voters' preferences on direct tax policies and the distribution $F(\phi_i)$, but they cannot identify the misperceived indirect tax differentials ϕ_i associated with a particular voter. As ϕ_i is a random variable to the candidates, voter i's vote for candidate 1 can thus be predicted as a probabilistic choice.

Then, we can derive a continuous probability voting function. Since we assign a probability distribution F_i to 'misperceived indirect tax differential', then the voter $i's$ probability to vote for candidate 1 is a continuous function of the utility differential obtained from direct tax policies :

$$P_i^1 = F_i \big[V_i(T^1) - V_i(T^2) \big] \tag{6}$$

where F_i is the probability distribution function assigned to misperceived indirect tax differential. $F_i(\cdot)$ is a smooth and continuous function. This smoothness implies that a small unilateral deviation by one candidate does not lead to jumps in its expected votes, and thus gives rise to well-defined equilibria. $F_i(\cdot)$ is a continuous and well-behaved cumulative distribution function (c.d.f.) which is associated with a probability distribution.

Note that under Downsian electoral competition with two political candidates,

---

12) Note that in the non-policy context, Hinich(1978) and Enelow and Hinich(1982) assigned a *normal distribution* to the non-policy difference between two candidates.

the probability to vote for a candidate, P_i^c, $c = 1, 2$, jumps discontinuously from 0 and 1 as voter i always votes with certainty for the candidate that promises the better policy. It is worthwhile to assume that a density function f_i is unimodal and symmetric. In particular, unimodel density function has a unique maximum. In addition, if τ_i^1 and τ_i^2 are independent identically distribution (i.i.d.), then a density function f_i is symmetric[13].

Similarly, candidate 2 has a symmetric problem. Assuming that there is no abstention, then the probability that voter i votes for candidate 2 is defined as P_i^2 :

$$
\begin{aligned}
P_i^2 &= 1 - P_i^1 \\
&= 1 + F_i\left[V_i(T^2) - V_i(T^1)\right]
\end{aligned}
\tag{7}
$$

where F_i represents a probability distribution function of $(\tau_i^1 - \tau_i^2)$. Note that when $(\tau_i^1 - \tau_i^2) < 0$, this indicates that the independent bias or independent preference is now in favor of the candidate 2.

Finally, following Downs' election model, the objective function of each candidates is assumed to maximize the expected vote (EV^c) which is defined as the sum of the probability of voters i to vote for a candidate: $EV^c = \sum P_i^c$. Hence, the candidate 1 is to maximize $\sum P_i^1$, whereas the candidate 2 is to maximize $\sum P_i^2$ or minimize $\sum P_i^1$. For instance, candidate 1 maximizes his expected vote as follows :

$$
Max \ EV^1 = \sum_{i=1}^{n} P_i^1 = \sum_{i=1}^{n} F_i\left[V_i(T^1) - V_i(T^2)\right]
\tag{8}
$$

This objective function means that each of the two candidates selects its

---

13) For more characteristics of density function, refer to Lindbeck and Weibull(1987).

direct tax policy so as to maximize its expected vote. We assume that the function $P_i^1(\cdot)$ is increasing and strictly concave in $V_i(T^1)$, and decreasing and strictly convex in $V_i(T^2)$. Then this model of electoral competition gives rise to a symmetric two-person zero-sum game. It is also known that this game has a unique equilibrium in pure strategies and moreover, the two candidates' direct tax policies are convergent, in equilibrium, on the same policy.

1. Political Equilibrium Structure in Direct Tax Policy Making

Based on a simple model described above, we now turn to characterize the political equilibrium structure in direct tax policy making. Each party or candidate wants to maximize expected votes (EV^c) subject to the budget constraint, which is defined as $TR^c = b_i(T^c) \cdot T^c$, where TR^c is the direct tax revenues for the candidate c and b_i is direct tax base or taxable activities:

$$\frac{\partial TR^c}{\partial T^c} \;=\; b_i \;+\; T^c \cdot \frac{\partial b_i}{\partial T^c} \;=\; b_i \cdot \left(1 \;+\; \frac{T^c}{b_i} \cdot \frac{\partial b_i}{\partial T^c} \right) \;=\; b_i \cdot \left(1 \;+\; \varepsilon_{b_i}^c \right) \tag{9}$$

where $\varepsilon_{b_i}^c$ represent the tax elasticity with respect to direct tax base, defined as : $\varepsilon_{b_i}^c \equiv \{(T^c/b_i) \cdot (\partial b_i/\partial T^c)\}$.

First, we consider the political equilibrium direct tax structure from maximizing expected votes. For example, candidate 1 maximizes his expected vote with respect to his direct tax policy subject to the budget constraint:

$$\underset{[T^1]}{Max} \;\; \sum_{i=1}^{n} P_i^1 \;=\; \sum_{i=1}^{n} F_i \big[V_i(T^1) - V_i(T^2) \big]$$

$$s.t. \;\; TR^1 \;=\; \sum_{i=1}^{n} b_i(T^1) \cdot T^1 \tag{10}$$

Similarly, the objective function for the candidate 2 can be specified. Then, we can derive first-order conditions for candidates 1 and 2, respectively, as :

$$f_i(\Phi_i) \cdot V_i'(T^1) \quad = \quad \lambda \cdot \frac{\partial TR^1}{\partial T^1}$$

$$f_i(\Phi_i) \cdot V_i'(T^2) \quad = \quad \mu \cdot \frac{\partial TR^2}{\partial T^2} \tag{11}$$

where λ and μ are Lagrange multipliers for candidates 1 and 2, respectively, in association with each budget constraint. And $V_i'(\cdot)$ represents the marginal political cost (MPC) of voters from direct taxation for both candidates.

Using $\partial TR^c / \partial T^c$ and rearranging these first-order conditions gives then :

$$\frac{f_i(\Phi_i) \cdot V_i'(T^1)}{b_i \cdot (1 + \varepsilon_{b_i}^1)} \quad = \quad \lambda$$

$$\frac{f_i(\Phi_i) \cdot V_i'(T^2)}{b_i \cdot (1 + \varepsilon_{b_i}^2)} \quad = \quad \mu \tag{12}$$

where $f_i(\Phi_i) > 0$ represents the probability densities which are positive and evaluated at the direct-tax-induced utility differential, Φ_i, where $\Phi_i \equiv V_i(T^1) - V_i(T^2)$. Thus, $f_i(\Phi_i)$ indicates the voter i's marginal probabilistic vote response to direct-tax-derived utility: $f_i(\Phi_i) \equiv F_i'(\Phi_i) \equiv \partial F_i / \partial V_i$. If $f_i(\Phi_i) > 0$, then this implies that the voter i's probabilistic vote will respond positively as voter i's utility increases. From the first-order conditions, we derive the political equilibrium in direct tax policy as follows.

Proposition 1 : The political equilibrium structure in direct tax policy depends both on the political opposition from direct taxation, $V_i'(T^1) < 0$, and on probability density, $f_i(\Phi_i)$, which are induced from the differentials in indirect tax misperceptions by voters. Then, the two first-order conditions show that for each candidate, the marginal loss in expected votes, or political opposition from the direct tax policy, per revenue increase should be equal for all voters i: thus, $MPC_1^{T^c} = MPC_2^{T^c} = \cdots = MPC_n^{T^c}$, where $MPC_n^{T^c}$ denotes the marginal

political costs (MPC) of voters n from direct taxation T^c, $c = 1, 2$.

Now, we suppose that $T^{*1} = T^{*2}$ is a necessary condition for equilibrium (i.e., a Nash equilibrium in the expected-vote maximizing game)[14] : that is, in a Nash equilibrium with simultaneous policy announcements, both candidates would announce the same equilibrium direct tax policies, and thus direct tax policies will converge: $T^{*1} = T^{*2}$. Then, $\Phi_i = V_i(T^{*1}) - V_i(T^{*2}) = 0$, and thus, we have $f_i(\Phi_i) = f_i(0)$. Now, substituting this into the first-order condition for candidate 1, then we obtain :

$$\frac{f_i(0) \cdot V_i'(T^1)}{b_i \cdot (1 + \varepsilon_{b_i}^1)} = \lambda, \quad \text{for } i = 1, 2, \cdots, n \tag{13}$$

where $f_i(0)$ denotes the probability density (p.d.f.) corresponding to the cumulative distribution function $F_i(\cdot)$, evaluated at 0 (i.e., at the equilibrium). Now, let us consider the following two special cases of candidate preference bias across voters, which are induced by voters' misperceived indirect taxes :

(Case 1) no candidate bias case : $f_i(0) = f_j(0)$, *for voters* $i \neq j$

(Case 2) candidate bias case : $f_i(0) \neq f_j(0)$, *for voters* $i \neq j$

First, we consider the Case 1 in which no candidate bias exists. If all voters have been assigned the same candidate preference distribution, then $f_i(0)$ are identical among voters : $f_i(0) = f_j(0) \equiv f(0)$, for voters i and j, $i \neq j$. Then, this implies that

---

[14] Assuming that two candidates 1 and 2 propose policy issue θ^1 and θ^2, respectively, Lindbeck and Weibull (1987) proves that i$(\theta^{*1}, \theta^{*2})$ is a Nash equilibrium in the expected plurality election game, then the two policies are converged at the equilibrium: $\theta^{*1} = \theta^{*2}$.

$$\frac{V_i'(T^1)}{b_i \cdot (1 + \varepsilon_{b_i}^1)} = \lambda, \quad \forall \ i = 1, 2, \cdots, n \tag{4}$$

In this case, the political equilibrium direct tax structure depends only on the political opposition from direct taxation, $V_i'(T^1)$. That is, the marginal loss in expected votes (or political opposition from direct taxation) from direct tax policy per revenue increase is equal among voters i. This corresponds, in general sense, to 'policy converging incentive' by candidates[15]. It is the visible direct tax policy that matters to voters. Thus, both candidates select the same direct tax policy, in equilibrium, which affects all voters.

Furthermore, this electoral equilibrium involves another important feature. That is, the equilibrium of this electoral competition implements the maximum of a weighted social welfare function, where voter i is supposed to receive political weight. Thus, the political equilibrium in this special case is identical with the utilitarian optimum f_i achieved when maximizing the 'social welfare function' $\sum f_i \cdot V_i(T^c)$ subject to the budget constraint[16]. This implies that voters with higher f_i will weigh more heavily, because in a neighborhood of the equilibrium they are more likely to reward policy favors with their vote. That is, more responsive voters, who have a higher density f_i, will receive a better treatment under the electoral competition in a representative democracy. However, if all voters are equally responsive (i.e., if they all have the same value of f_i), then this form of electoral competition will implement the utilitarian optimum.

In summary, the lack of any candidate bias from indirect tax misperception reduces the model to the familiar case in which candidate's direct tax policies

---

[15] In this case, each candidate has a 'centripetal policy incentive' as defined by Cox(1993).

[16] [16] In a balanced-budget redistribution model, Lindbeck and Weibull interpret this result as: if the candidates use the same party preference distributions for each voter thats ($F_i = F_j, i \neq j, \forall \ i, j \in n$), then "democratic electoral competition for the votes of selfish individuals produces the same income distribution as would an omnipotent Benthamite government" (see Lindbeck and Weibull (1987), p. 278).

converge on the policy that may be regarded as socially optimal. In this special case where no systematic bias in candidate preferences are observed, but direct tax preferences are different among voters, optimal direct tax policies of both candidates will be pursued until the marginal loss in expected votes from direct taxation is equal in all voters, implying that democratic electoral competition results in the same direct tax policy as in the utilitarian social welfare maximization.

   Second, we consider the Case 2 in which candidate bias exists across voters. We assume that all voters have different candidate preference distributions : $f_i(\Phi) \neq f_j(\Phi)$, for voters i and j, $i \neq j$, (but the same direct tax preference: $V_i = V_j = V$, for voters $i \neq j$). Then, the first-order condition for candidate 1 is changed into :

$$\frac{V_i'(T^1)}{b_i \cdot (1 + \varepsilon_{b_i}^1)} \quad = \quad \frac{\lambda}{f_i(\Phi_i)} \tag{15}$$

   This implies that the political equilibrium direct tax structure depends only on the expected candidate bias distribution, $f_i(\Phi_i)$, which is assumed to stem from the differences in the misperceived indirect taxes, since political opposition from direct taxation across voters are assumed to be identical. Since we assumed that the numerator in the left-hand side is the same across voters, the political direct tax structure is a decreasing function of the expected candidate bias, $f_i(\Phi_i)$. This implies that the equilibrium direct tax policy is negatively related to the expected candidate bias. Thus, we summarize this outcome from the candidate bias as follows.

   Proposition 2 : If some voters have stronger candidate bias from different indirect tax misperceptions, then both candidates will favor such voters. By contrast, if there is weaker candidate bias by some voters, then candidates will disfavor such voters.
   In equilibrium, both candidates will favor those voters whose expected

candidate biases stemmed from misperceived indirect taxes are stronger because such voters have smaller political opposition. Thus, the two candidates will not tend to favor marginal or swing voters who have weaker candidate bias and thus larger political opposition from direct taxation. Instead, the political candidates tend to favor voters with stronger candidate preferences[17].

Each political candidate will choose both direct tax policy and indirect tax policy differently in order to attract the majority and minority voters. For example, each candidate has an incentive to provide visible direct tax to the majority, whereas providing less visible indirect tax to the minority, in order to maximize expected votes. In other words, this implies that candidates attempt to manipulate less visible indirect tax policy which will affect the minority voters. Thus, they have a relatively large freedom for direct tax increase relative to identical candidate preferences. Alternatively, by manipulating hidden indirect taxes, they can increase political support from minority voters.

In summary, in a special case in which candidate preferences are different, but direct tax preferences are identical among voters, both candidates will, in equilibrium, favor voters with stronger candidate preferences. That is, different candidate preferences of voters stemming from misperceived indirect taxes between candidates will provide an incentive for both candidates to favor voters with stronger candidate preference when choosing direct tax policy.

2. Indirect Tax Misperception and Tax Connection

(1) Politics of Indirect Taxation

From the political perspective, there are theoretical reasons why one might prefer indirect to direct taxes. First, indirect taxes, like VAT and excise taxes, are widely regarded as much easier to raise than direct taxes. For example, under the UK Conservative governments of 1979~1997, VAT was raised, first from 8% and 12% to 15% and then a second time to 17.5%, while over the last two decades excise duties on petrol, tobacco and wine in UK. have been raised

---

[17] In particular, this result indicates that there will be 'centrifugal policy incentive'. This concept was defined by Cox(1993).

by more than the rate of inflation. New indirect taxes, such as on insurance premiums and air travel, have also been introduced. Moreover, excise taxes are a relatively sure source of revenue. In economic terms, the demand for alcohol and tobacco is relatively inelastic. A high tax rate simply produces greater revenue for government.

Second, indirect taxes can, in some sense, be described as voluntary, since they are paid only if and when purchases are made. Unlike taxes on income or savings, which are levied automatically, the amount of indirect tax a person pays is, in principle, under his or her own control.

Third, the attraction of indirect taxation to politicians has, in fact, been intensely pragmatic. Indirect taxes are generally less visible to the individual taxpayer than direct taxes. People can see how much they pay in income tax on their monthly pay slip and their annual tax return. But, indirect taxes are paid through the price of goods, and the amount is rarely made clear. Where excise duties are concerned, the variation in rates means that most consumers have no idea how much of the price of the good is actually tax. For instance, at present, around 50 percent the price of a standard bottle of table wine is tax, and 79 percent of the price of a packet of cigarettes is tax in the UK. In general, in the UK over the past twenty years, this relative invisibility has made indirect taxes attractive for UK Chancellors seeking to raise extra revenue. It is almost impossible for most people to tell 'how much they pay in indirect tax'. Most people are aware that they pay high rates of indirect taxes but few know, in relation to their own income, exactly how high or high much. Many people now appear to feel that indirect taxes are almost a ruse allowing governments to take money in an underhand, invisible way. Thus, with indirect taxes, it is virtually invisible to know what one is paying.

Fourth, indirect taxes are essentially regressive in their effect. Since the same rate of tax is paid by all consumers, taxes on spending bear more heavily on those who are poor than on the better off. For instance, in UK, the 17.50 pounds in VAT paid on 100 pounds worth of expenditure by a person earning, say, 10,000 pounds a year represents a much higher proportion of income than the same 17.50 pounds for a person on 100,000 pounds. This effect is exacerbated for those goods which form a higher proportion of household

expenditure for people on low incomes than those with high incomes. Taxation of such items is particularly regressive.

Fifth, excise taxes are sometimes called 'sin taxes' because they tend to fall most heavily on commodities such as alcohol and tobacco. This is a moral element to having high prices charged through taxation for these goods. Finally, excise taxes on fuel and tobacco are dedicated to, or earmarked taxes. That is, it is common to allocate the revenue from the tax collected on fuel and tobacco to highway construction and health. In some countries, all or a portion of the revenue derived from the tax on alcoholic beverages and tobacco is used for treating alcoholism and smoking-related diseases. Further, because those who pay the tax tend to benefit from earmarking, there is a tendency to think of excise taxes as user charges.

Excise taxes, like VAT, are included in the selling price of the commodity so that these are 'invisible' and therefore 'less politically sensitive' forms of taxation. Although it is difficult to isolate the politics from economics, several characteristics of taxation, such as 'visibility' or 'political acceptability', have a special political flavor. Taxes are important political instruments and have important political values. Thus, their evaluation must reflect their political characteristics and political consequences. The main feature of VAT and excise taxes is relative invisibility. Although citizens may know in the back of their minds that they are paying the tax, they are not reminded of this directly. Popular resistance to the VAT may therefore be less than it would be to an income tax that is more visible. Although the concept of 'visibility' is somewhat imprecise, and we can debate whether one tax is more visible than another, this is an important 'political consideration'.

Governments therefore attempt to make taxes as invisible as possible. If governments employ 'invisible taxes', they can impose substantial taxes on the public, and even manipulate rates, with little or no reaction. Wilensky's(1976) analysis of 'tax protest' found that the visibility of the tax system was the principal variable explaining the development of tax protest and interest groups. For example, the visibility of the property tax helps to explain why it has been such a common target for attack by tax protesters in the United States. In short, if governments want to collect as much money as possible with minimum

amount of resistance, they should attempt to make their tax structures as invisible as possible.

(2) Tax Disconnection

We now compare fiscal connection to tax connection. First, Hettich and Winer(1988) considered both taxation and public services in their probabilistic voting model, but assume that there is no link between them. Instead, they assume there is complete separation or independence relation between taxation and public expenditures. However, this fiscal disconnection implies that it is not made clear to voters that increases in public expenditure will have to be paid for by increases in taxation. The 'fiscal connection' is generally not perceived by voters because of the asymmetric relation of voters between tax and benefits. Thus, fiscal disconnection may lead to an expansion in public expenditures.

Second, in our context, when the tax connection between direct tax and indirect tax is made explicit, it will tend to temper the enthusiasm for increased indirect tax and in turn, to reduce antipathy or political opposition towards direct taxation. But we assumed in our model that tax connection is indirect or probabilistic. In our case where we assumed implicit linkage between direct tax and indirect tax, party bias on indirect tax misperception is an important factor to decide the political equilibrium in direct tax. In particular, in our context, direct tax increase will happen when the party bias is stronger.

Now, we examine two implications of both the tax disconnection and the indirect tax misperception for the direct tax policy making. First, we examine the implication of tax disconnection for direct tax policy. The central objective of the political parties must be to connect voters or citizens more strongly to the direct taxes they pay in a visible way and to the indirect taxes which pay in a hidden or invisible manner. Voters need to know how their taxes are being paid, and how their taxes are being spent. Thus, any explicit goal of raising direct taxation to pay for higher public spending will be politically difficult so long as the voters' sense of 'tax disconnection' exists. Therefore, voters' sense of connectedness must be the principal political task for taxation policy. This implies that if voters can be sure that the money is genuinely going to improve

the public services, then they will be willing to pay more in taxes. On the other hand, disconnection may undermine voters' support for direct taxation policy, and fuel potentially a certain kind of tax resistance.

Moreover, the implication of tax disconnection for direct tax policy making depends on its degree. The more disconnected the direct tax and indirect taxes are, the more candidates or parties may increase their direct taxes. That is, the political parties or candidates have an incentive to disconnect the direct taxes to the indirect taxes in order to increase the political supports from voter and thus, be able to increase direct taxes. Thus, political parties will attempt to propose 'disconnecting schemes' as platforms not only in order to convince voters, but also to reduce the political opposition from taxation. On the other hand, the more disconnected the direct tax and the indirect taxes are, the less political parties may face political opposition from direct taxation, and thus the more candidates may increase their direct taxes.

Second, we examine the implication of indirect tax misperception for the direct tax policy making. To this end, we may ask a question as to whether indirect tax misperceptions influence the outcome of direct tax policy, or the tax structure, in modern democracies. We can explain this in two ways. First, we assume that two voting groups differ regarding their perceptions on the indirect taxes: one group misperceives their indirect taxes and the other group perceives accurately their indirect taxes. In this case, those who misperceive their indirect taxes will demand more public goods than those who perceive their indirect taxes accurately. Thus, those who misperceive their indirect taxes will support more direct tax increase than those who perceive their indirect taxes accurately. Second, we assume that two groups differ concerning their misperceptions on the indirect taxes: one group underestimates their indirect taxes and the other group overestimates their indirect taxes. In this case, those who underestimate their indirect taxes will demand less direct tax increase than those who overestimate their indirect taxes. The more they underestimate their indirect taxes, the less direct tax increase they will support. These two cases correspond to the standard results in tax illusion models.

But, in our context, we may have a different implication. We assume that two voting groups all have misperceptions on the indirect taxes, but the extent of

their misperceptions is different between voting groups: one group has larger misperception on the indirect taxes and the other group has smaller indirect taxes misperception. Then, a group with smaller misperception will have larger political opposition from direct taxation, and thus will oppose direct tax increase.

IV. Tax Administration Cost Effect

In a basic model, we assumed that direct tax policy is visible to voters. This assumption means that voters can perceive direct tax policies of both candidates without incurring any perception costs. But this rules out the possibility that both candidates incur administration costs to implement their direct tax policy or to advertise their direct tax policy in order to increase the visibility and transparency. Note that voters will not incur any perception costs because direct tax policy is perceived correctly by voters because of its visibility[18]. Furthermore, we assume that candidates have different administration costs between direct tax and indirect tax. Each candidate spends resources in implementing direct tax policy, but does not spend in informing less visible and misperceived indirect taxes : we refer to this as direct tax administration costs. Thus, we focus on the direct tax administration costs, rather than the indirect tax administration costs, to examine whether candidates engage in proposing excessively costly direct tax policy.

Now, we extend the basic model to include administration costs necessary to implement and advertise direct tax policies. Here we define administration costs as the costs incurred by candidates to advertise direct tax policy. We assume that administration costs for each candidate, $A_c \ for \ c = 1, 2$, depend only on its own direct tax policy, T^c, and are assumed to be twice continuously differentiable. In particular, we assume that both the costs and the marginal costs increase as the direct tax increases or as direct tax policy is more complicated[19] :

---

[18] However, voters will incur perception costs on the indirect taxes because they are less visible and thus misperceived by voters.

$$A_c = A_c(T^c), \ c = 1, 2$$

$$\frac{\partial A_c}{\partial T^c} > 0, \quad \frac{\partial^2 A_c}{\partial T^c \cdot \partial T^c} > 0 \tag{24}$$

So, the budget constraint is now given as :

$$TR^c = b_i(T^c) \cdot T^c - A_c(T^c) \tag{25}$$

Then, with administration costs incorporated, we can reformulate the first-order condition for candidate 1 as :

$$\frac{f_i(0) \cdot V_i'(T^1)}{b_i \cdot (1 + \varepsilon_b^1) - A_1'(T^1)} = \lambda \tag{26}$$

where A_1' represents the marginal tax administration cost of candidate 1 incurring to advertise or implement direct tax policy, and was assumed to be positive in equilibrium: $A_1'(T^1) \equiv \partial A_1 / \partial T^1 > 0$. This modified condition shows that political equilibrium direct tax structure still depends on the political opposition and probability density for indirect tax misperception. It means that the marginal disutility, or political opposition, from direct taxation should be equal among voters i per revenue increase net of direct tax administration costs. Moreover, this implies that electoral competition for votes will not induce each candidate to engage in costly direct tax policy. That is, if direct tax policy is excessively costly, then voters will perceive such policy to be more complex, and thus each candidate would face larger political opposition.

From this equation, we can deduce a positive relation between tax administration costs and voters' political opposition from direct taxation. In other words, an increase in tax administration costs leads to an increase in political opposition of voters from direct taxation, thus resulting in an incentive for both

---

19) The assumption of positive marginal cost is of significance in the sense that it prevents each party from gaining the votes by costless decreasing the direct tax policy to the voters with a negative marginal cost.

candidates to decrease direct tax administration costs. This implies that voters will favor candidates with lower marginal tax administrative costs which lead to lower political opposition towards direct taxation. We summarize tax administration cost effect as follows.

Proposition 3 : Assuming that $\partial A_1 / \partial T^1 > 0$ and for given identical candidate bias $f_i(0)$, both candidates may have an incentive to decrease direct tax administration costs in equilibrium, since lower administration costs lead to reducing political opposition of voters from direct taxation. Thus, voters tend to favor a candidate with lower direct tax administration costs.

For example, informed voters who perceive easily direct tax policy will consider such a candidate (with lower administration cost) as one with relatively simple direct tax policy or with more transparent direct tax policy.

V. Concluding Remarks

In a general probabilistic voting model, the two important assumptions are to make that candidates are uncertain about voters' choice in voting behavior, and voters are also uncertain about the indirect tax policies proposed by candidates. Voters' uncertainty stems from the voters' misperception about indirect taxes. For the candidates' uncertainty, candidates see voter's perception on the indirect tax policies as imperfectly measured or observed and thus, they include a random term in their expected vote calculations so as to represent this immeasurable or unobservable variable.

Theoretically, there can be a direct link between direct tax and indirect tax. But we assume that there are separate and asymmetric relations between them. First, direct taxes are separately related to indirect taxes. Second, voters have misperceptions on the indirect taxes, while having correct perceptions on direct tax policy. We have made two distinctive assumptions: in addition to visible direct tax policy, the indirect tax policy is also an important determinant of voting behavior but separately related to direct taxes, and voters' attitudes to

indirect taxes are imperfectly perceived by the candidates or parties, and thus, it is treated as random variable.

We have examined the effect of indirect tax misperception on the direct tax policy making and its political opposition in a general probabilistic voting model. We focused on the candidates' selection of direct taxation policy. However, differences between candidates concerning voters' misperceptions on indirect taxes are also important for the direct tax policy outcome. The relation between direct tax and indirect tax policies has been divided into complete linkage and complete separation. But, we adopt an incomplete or probabilistic linkage in order to examine how voters' different misperceptions towards indirect taxes affect direct tax policy.

We summarize our main results. First, the political equilibrium direct tax structure depends both on the political opposition towards direct taxation, and on probability densities which are induced from the differentials in indirect tax misperceptions by voters. Then, this implies that for each candidate, the marginal loss in expected votes, or political opposition, towards the direct tax policy per revenue increase should be equal for all voters. Second, assuming different candidate bias and that some voters have stronger candidate bias from different indirect tax misperception, then candidates will favor such voters because of their smaller political opposition. This implies that the political candidates will not tend to favor marginal or swing voters who have weaker candidate bias and thus larger political opposition from direct taxation. Finally, assuming that marginal administration costs are positive, political candidates may have an incentive to decrease direct tax administration costs in equilibrium, since higher administration costs lead to larger political opposition from direct taxation.

More research should be devoted to developing and analyzing more general model. In addition, it may be interesting to test our model empirically which will be our next agenda.

[References]

Austen-Smith, David, "Interest Groups, Campaign Contributions, and Probabilistic Voting," Public Choice, Vol. 54, 1987, pp. 123~139.

Coughlin, Peter, "Pareto Optimality of Policy Proposals with Probabilistic Voting," Public Choice, Vol. 39, 1982, pp. 427~433.

Coughlin, Peter and Shmuel Nitzan, "Electoral Outcomes with Probabilistic Voting and Nash Social Welfare Maxima," Journal of Public Economics, Vol. 15, 1981, pp. 113~121.

Cox, Gary W., "Centripetal and Centrifugal Incentives in Electoral System," American Journal of Political Science, Vol. 34, No. 4, 1990, pp. 903~935.

Downs, Anthony, An Economic Theory of Democracy, New York: Harper and Row, 1957.

Downs, Anthony, "Why the Government Budget Is Too Small In A Democracy," World Politics, Vol. 12, No. 4, July 1960, pp. 541~563.

Enelow, James M. and Melvin J. Hinich, "A New Approach to Voter Uncertainty in the Downsian Spatial Model," American Journal of Political Science, Vol. 25, No. 3, August 1981, pp. 483~493.

Enelow, James M. and Melvin J. Hinich, "Nonspatial Candidate Characteristics and Electoral Competition," Journal of Politics, Vol. 44, No. 1, February 1982, pp. 115~130.

Enelow, James M. and Melvin J. Hinich, "Probabilistic Voting and the Importance of Centrist Ideologies in Democratic Elections," Journal of Politics, Vol. 46, No. 2, May 1984, pp. 459~478.

Enelow, James M., "A General Probabilistic Spatial Theory of Elections," Public Choice, Vol. 61, 1989, pp. 101~113.

Hinich, Melvin J., "Equilibrium in Spatial Voting: The Median Voter Result is an Artifact," Journal of Economic Theory, Vol. 16, 1977, pp. 208~219.

Hettich, Walter and Stanley L. Winer, "The Political Economy of Taxation", in Mueller, Dennis C., Perspectives on Public Choice : A Handbook, Cambridge University Press, 1997.

Hettich, Walter and Stanley L. Winer, Democratic Choice and Taxation : A Theoretical and Empirical Analysis, Cambridge University Press, 1999.

Holcombe, Randall G., "Tax Policy from a Public Choice Perspective," National Tax Journal, Vol. 51, No. 2, 1998, pp.359~371.

Lafay, Jean-Dominique, "The Silent Revolution of Probabilistic Voting," in Preferences and Democracy, Breton, A., Galeotti, G. Salmon, P. and Wintrobe, R.(edited), 1993, pp. 159~191.

Ledyard, John D., "The Pure Theory of Large Two-Candidate Elections," Public

Choice, Vol.44, 1984, pp. 7~41.

Lindbeck, Assar and Jorgen W. Weibull, "Balanced-Budget Redistribution as the Outcome of Political Competition," Public Choice, Vol. 52, 1987, pp. 273~297.

Lindbeck, Assar and Jorgen W. Weibull, "A Model of Political Equilibrium in a Representative Democracy," Journal of Public Economics, Vol. 51, 1993, pp. 195~209.

Mueller, Dennis C., Perspectives on Public Choice : A Handbook, Cambridge University Press, 1997.

Na, Seong-Lin and Lee, Sung-Kyu, "The Effect of Voters' Benefit Misperception on the Tax Policy Making in a Simple Probabilistic Voting Framework," Journal Economic Research, May 2005, pp. 1~28.

Persson, Torsten and Guido Tabellini, Political Economics: Explaining Economic Policy, MIT Press : Cambridge, 2000.

Wilensky, Harold L., The 'New Corporatism', Centralization and the Welfare State, Sage Publications: London, 1976.

Winer, Stanley L. and Walter Hettich, "What is Missed If We Leave out Collective Choice in the Analysis of Taxation," National Tax Journal, Vol. 51, No.2, 1998, pp. 373~389.

Wittman, Donald, "Candidates with Policy Preferences: A Dynamic Model," Journal of Economic Theory, Vol. 14, 1977, pp.180~189.

[국문초록]

간접세에 대한 인식이 직접세 정책결정과정에 미치는 효과

이영환·이성규

　본 논문은 일반적 확률투표 모형을 사용하여 투표자의 간접세에 대한 잘못된 인식이 후보자의 직접세 조세정책 결정과정에 미치는 효과를 분석하고 있다.

　대의민주주의 제도 하에서 선거에 출마하는 후보자들은 투표자들로부터 정책뿐만 아니라 비(非)정책적 요인들에 의해서도 평가를 받는다. 본 논문은 투표자들의 간접세에 대한 잘못된 인식을 확률변수로 간주하고 있다. 직접세와 간접세는 특성상 분리되어 있고, 투표자들은 직접세와 간접세에 대해 비대칭적으로 인식하고 있음을 가정하였다. 투표자들은 간접세의 비가시성(invisibility) 때문에 간접세를 잘못 인식하는 경우가 많다. 직접세와 간접세 간의 이러한 관계를 확률적 관계로 규정함으로써 투표자들의 간접세에 대한 잘못된 인식이 직접세 조세정책 결정과정에 미치는 효과를 분석하고 있다. 또 조세 행정비용을 모형에 도입함으로써 직접세의 정치적 비용에 미치는 효과도 분석하고 있다. 직접세의 정치적 균형 구조는 직접세에 대한 정치적 반대뿐만 아니라 간접세의 잘못된 인식에 의해서도 영향을 받는다. 그 결과 후보자들은 간접세 인식의 오류로부터 발생하는 후보자 편향(bias)이 큰 투표자들을 편애하게 된다. 또 직접세 정책 홍보에 행정비가 드는 경우 후보자들은 정치적 비용을 우려하여 직접세의 징세비를 낮추려는 유인을 가지게 된다.

핵심주제어 : 확률적 투표, 후보자 경쟁, 간접세 환상
JEL 번호 : D72, D78, H22