Corporate Charitable Giving with Tax Deduction Ceilings: The Korean Case

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<Abstract>

The paper examines corporate contributions to charitable organizations, mainly focusing on the influence of the corporate income tax rate on corporations’ donations. We analyze determining factors for a corporation’s donation in a framework of economic theory; profit-maximization or utility-maximization. One of our contributions in theoretical concern is to analyze the relationship between the corporate income tax rate and the corporate donation in case where the company’s donation is less than the deduction limit such as in Korea. And we empirically examine the determinants of corporations’ donations by using a panel data of 2001-2012 periods in Korea. Based on Hausman test, we use fixed effect model of panel analysis and obtain the relevance of corporate income tax rate in determining the magnitude of corporate donations when corporate donations are less than the 5% deduction limit.

Key words: Corporate Charitable Giving, Tax Deduction Ceilings, Non-Profit Organization
I. Introduction

The role of non-profit organizations on charitable aids and poverty reduction has been rapidly growing in the modern society. One of the most important methods of raising funds by non-profit organizations is to attract donations from the private sector, and governments of most countries provide tax incentives to induce more private donations towards non-profit organizations. Corporations’ donations, it is argued, could contribute the profit either by revenue increase or by cost decrease throughout the image enhancement (Schwartz 1968, Clotfelter 1985, Navarro 1988).

Tax rate itself seldom affects the magnitude of corporations’ donation, however, since a typical corporation’s donation might be less than deduction limits (Clotfelter 1985, Boatsman & Gupta 1996). The reason is that if a typical company donates the amount less than the deduction limit for the profit-maximization, the change of corporate income tax rate does not have an impact on the donation amount since it already decides the optimal donation amount independent of tax rate (Clotfelter 1985).

It is reported that in US private companies usually donate less than the deduction limit, 10% of the taxable income. Thus, the corporate income tax rates do not have an influential impact on corporate donation amounts in US (Clotfelter 1985). On the other hand, there have been continuous demands for more effective tax incentives to induce more donations from corporations in Korea, where the deduction limit for corporate donations is 5% of the taxable income. We can also expect that there will be even more various and strong demands for more incentives towards
donations in the future. Unfortunately, there have not been many studies regarding corporations' donation in Korea even if the interests of our society on corporations' donation have been growing so rapidly.

The paper examines corporate contributions to charitable organizations, mainly focusing on the influence of the corporate income tax rate on corporations’ donations. We analyze determining factors for a corporation’s donation in a framework of economic theory; profit-maximization or cost-minimization.

The model checks the effectiveness of advertising expenses, industry structure, labor intensity, tax rate, corporate income, etc. One of our contributions in theoretical concern is to analyze the relationship between the corporate income tax rate and the corporate donation in the case where the company’s donation is less than the deduction limit.

And we empirically examine the determinants of corporations’ donations by using a panel data of 2001-2012 periods in Korea. Based on Hausman test, we use fixed effect model of panel analysis and obtain the relevance of corporate income tax rate in determining the magnitude of corporate donations when corporate donations are less than the 5% deduction limit.

The study advances the following result. It may be possible for tax policy to affect a corporation’s donation under the condition that the total amount of donation from a corporation is not fully deductible due to the deduction limits. This implies that a corporation’s incentive to donate is affected by the relationship between the actual amount of total donation and the maximum amount of deductible donation.
The paper goes as follows. In section II, we survey the literature on charitable contributions of the business sectors, and propose an issue of the deduction limits. Section III introduces a basic model with tax deduction limits in which we deal with the relevance of tax deduction rates to corporate donations, and propose the several cases where the impact of tax rates on the contribution is different over the cases. Section IV reports the regression results for the determinants on the corporate charitable giving. Section V presents a summary and conclusion of the study.

II. Literature Review

1. Theoretical Analysis

There are two different models that explain why companies do contribute. The first one is the profit maximization model and the second one is the utility maximization model. The profit maximization model says that corporations’ contribution may either increase revenues or reduce costs, while the utility maximization model says that managers of the corporation derive utility from making contributions. In this section we will discuss in details the profit maximizing model.

Consider a firm with production function $Q(X, G)$, where $G$ is contributions and $X$ is other inputs. Where $t$ is the tax rate, $p$ is the output price, $s$ is the price of the composite input $X$, net profits can be expressed as

$$N = [pQ(X, G) - sX - G](1 - t)$$

with the assumption of full deduction. The first-order condition determining the demand for contributions in competitive markets is
\[
p \cdot \frac{\partial Q(X, G)}{\partial G} - 1 = 0 \Rightarrow p \cdot \frac{\partial Q(X, G)}{\partial G} = 1
\]

That is, the value of the marginal product is equal to the before-tax price of giving a dollar. From the above expression we can notice that the optimal contribution is not a function of the income tax. Clotfelter (1985) shows that the qualitative result is not affected with the assumption that the price of inputs is a function of contributions, s(G). Navarro (1988) also shows that the income tax has no effect on the company’s optimal contributions as shown in Clotfelter (1985).

The result that the income tax has no effect on the company’s optimal contributions is dependent on the assumption that contributions are fully tax deductible. If this assumption is relaxed, the result will be different due to a change in the relative price of input. Clotfelter (1985), Boatsman & Gupta (1996) argue that analyzing contribution of the U.S companies with the assumption of full deduction is reasonable since the current 10% of net income ceiling on deductibility is seldom reached.

If we consider the facts that the ceiling of tax deduction in Korea is 5% which is lower than the U.S, and that most of contribution by companies are made from the large-sized companies which normally contribute more than the ceiling, the assumption of full deduction is not reasonable for the companies in Korea.

One can argue that profit-maximizing manager would try to promote the company’s image by spending advertising expenditures which are not subject to any ceiling by tax law instead of contributing more than the ceiling subjected by the tax law.

In conclusion, if we have a case where contributions of a company exceed its
ceiling for tax deduction, then it is possible that the income tax can affect the company’s optimal contribution even in the profit maximizing model.

2. Empirical Analysis

The empirical analyses on the corporate giving have focused on examining the results derived from both the profit maximizing model and the utility maximizing model.

The profit maximizing model argues that corporations contribute either to increase revenues or to reduce costs, and hence variables commonly used in empirical works are advertising as a revenue-related variable and labor intensity as a cost-related variable.

Advertising is considered to serve a purpose similar to that of contribution. Therefore, it is hypothesized that a corporation spending more advertising expenses tends to contribute more. Schwartz (1968), Levy & Shatto (1978), Maddox & Siegfried (1980), Navarro (1988), Boatsman & Gupta (1996) support the hypothesis.

Labor intensity is used to test the hypothesis that a corporation making more contribution tends to run with less labor costs because workers are willing to work at a company with positive profile even with less wages.

The empirical works for the utility maximizing model include variables such as debt-equity ratio, dividend changes. It is hypothesized for the debt-equity ratio that there is a negative relationship between corporate giving and debt-equity ratio because the utility maximizing manager tends not to fully utilize the leverage. Navarro (1988), Boatsman & Gupta (1996) supports the hypothesis.

Dividend change is included to test the hypothesis that an increase in dividends will be associated with a loosening of shareholder constraints on perquisite consumption. Navarro (1988) supports the hypothesis, while Boatsman & Gupta (1996) shows the opposite result.

Tax rate is always included in most empirical works. If the coefficient of tax rates is statistically significant, it is interpreted that the empirical result supports the utility maximizing model. On the contrary, if the coefficient is not statistically significant, the empirical result supports the profit maximizing model. Studies using time series data such as Schwartz (1968), Nelson (1970), Levy & Shatto (1978), Clotfelter (1985) derive a positive relationship between corporate giving and tax rates, and coefficients are statistically significant. Navarro (1988) using firm-specific cross-sectional data shows a negative relationship between tax rates and corporate giving, which is the opposite result from the previous studies. However, the coefficient is not statistically significant. Boatsman & Gupta (1996) is differentiated from the previous studies since marginal tax rates are used instead of average tax rates. A negative relationship between tax rates and corporate giving is derived, and the coefficient is statistically significant. Boatsman & Gupta (1996) argue that their result supports the utility maximizing model rather than the profit maximizing model.
Income is also always included in most empirical works. Its inclusion is important for several reasons. First, the coefficient represents the income elasticity of corporate contributions. Second, the variable can play a role as a proxy for the size of corporation. Third, a potential omitted variable bias resulted from the expected correlation between income and tax rate can be avoided by its inclusion.

III. Theoretical Model

Clotfelter (1985) proposed two models of firm giving behavior in order to analyze the impact of taxes on firm giving; a profit maximization model and a utility maximization model. He admitted that in the profit maximization model taxes don’t have any role in determining corporate contributions. Therefore, he introduced a kind of inter-temporal impact of taxes into the profit maximization model, and argued that corporate foundations act to reinforce the inter-temporal tax effect by smoothing out charitable gifts to the NGOs over time. Then, Clotfelter (1985) swiftly used a utility maximization model to provide the theoretical impact of tax deduction rates on corporate contributions, proposing that the effect of a change in the tax rate on contributions can be positive for the quadratic production functions.

In brief, Clotfelter (1985) ignored the probable impact of the deduction limit because it was reported that in US private companies usually donate less than the deduction limit 10% of the taxable income. However, Son (2009) reported that in Korea 13% of private companies donate more than the deduction limit 5% of the
taxable income, and admitted that the impact of the tax rate on the contributions is (i) positive for the firms with the contribution level being less than the deduction limit or (ii) negative for the firms with the contribution level being more than the deduction limit in the Korean case.

We now propose the profit maximization model for (ii) and the utility maximization model for (i) with rigorous flavor of theory.

1. Profit Maximization Model

A typical firm maximizes the after-tax profit by deciding the level of charitable giving. Thus, we can formalize the firm’s maximization problem as

$$\max[rQ(X,G) - sX - G - t(rQ(X,G) - sX - \min\{G, \frac{1}{20}(rQ(X,G) - sX - G)\})]$$

(1)

where r is the product price, s the input price, X the input quantity, G the level of contributions, Q the product quantity, t the tax rate. Thus, the profit would be the revenue less the input cost, less the amount of charitable contributions, less the tax. The tax amount is the tax rate times the tax base which is the revenue less the input cost, less the minimum between the amount of charitable contributions and the limit of tax deduction. As in the Korean statute, we assume that the deduction limit is the 5% of the tax base.

We observe as in Son (2009) that there is a good deal of companies whose contribution is greater than the deduction limit of 5% in Korea. Thus, the minimum value is G for often than not. Now we withdraw a first-order necessary condition for
the maximization with respect to G from (1) as

\[ rQ' - 1 - t(rQ' - \frac{1}{20}(rQ' - 1)) = 0. \]  \(\text{(2)}\)

(2) means that the marginal value product from G, \(rQ'\), should be equal to the donation cost 1 itself plus the tax cost from G. Then with the normalization \(r = 1\), we obtain

\[ Q' = \frac{1+\frac{1}{20}t}{1-t+\frac{1}{20}t}. \]  \(\text{(3)}\)

We now assume that the interior maximum \((X,G)\) exists as well as that the second-order sufficient condition is satisfied. Then, we can consider the equation in (3) as an identity equation including \(Q'(X,G)\) for reasonable level of \(t\), and use the total differentiation with respect to \(G\) and \(t\). Therefore, we obtain

\[ Q' \, dG = \frac{1}{(1-\frac{19}{20}t)^2} \, dt. \]

Now we may use it to get

\[ \frac{dG}{dt} = \frac{1}{Q' \, (1-\frac{19}{20}t)^2}. \]  \(\text{(4)}\)

(4) means that the derivative of \(G\) with respect to \(t\) has the same sign as \(Q''\). The sign of \(Q''\) seems to be negative for some range of \(G\) as in the quadratic production function of Clotfelter (1985). Clotfelter (1985)'s example is \(Q(G) = -cG^2 + bG + a\) and \(G' = -c < 0\).

Therefore, from the profit maximization model we obtain that if the firm's
contribution is greater than the deduction limit, then the differentiation of the contribution $G$ with respect to the tax rate $t$ is “negative” for the quadratic production function with the marginal product diminishing.

Now for the company whose contribution is smaller than the deduction limit, the minimum value in (1) is $G$, the level of contribution. Then the first-order necessary condition for the maximization problem with respect to $G$ is $Q' = 1$ regardless of the level of $G$. This case is analyzed in Clotfelter (1985), saying that the tax rate doesn’t give any impact on the contribution level in the profit maximization model.

Therefore, we have showed that the tax rate may give impact on the contribution level even in the profit maximization model when the contribution level is greater than the deduction limit as in the case of Korea. We summarize the above argument as a theorem.

**Theorem:** For the interior maximum of the profit maximization problem in (1), if the firm’s contribution is greater than the deduction limit, then the differentiation of $G$ with respect to the tax rate have the same sign of $Q''$ as in (4).

2. Utility Maximization Model

A typical firm maximizes the utility both from the charitable contribution itself and from the after-tax profit by deciding the level of charitable giving. Thus, we can formalize the firm’s maximization problem as $\max U(G, N)$ where $N$ is the after-tax
profit which would be the revenue less the input cost, less the amount of charitable contributions, less the tax as in (1).

When the contribution is less than the deduction limit, the minimum value is $G$. The first-order necessary condition is

$$U_G + U_N[Q' - 1 - t(Q' - 1)] = 0.$$ 

From this equilibrium condition, as in Clotfelter (1985), we can get the positivity of the impact of the tax rate on the charitable contributions.

When the contribution is greater than the deduction limit, the minimum value is the deduction limit. The first-order necessary condition is then

$$U_G + U_N[Q' - 1 - t(Q' - \frac{1}{2} (Q' - 1))] = 0.$$ 

From this equilibrium condition, we obtain

$$Q' = \frac{1+\frac{1}{2} t + \frac{U_G}{U_N}}{1-t+\frac{1}{20}}.$$  

(5)

We now assume that the interior maximum $(X,G)$ exists as well as that the second-order sufficient condition is satisfied. Then, we can consider the equation in (6) as an identity equation including $Q'(X,G)$ for reasonable level of $t$, and use the total differentiation with respect to $G$ and $t$. Therefore, we obtain

$$Q' \, dG = \frac{1+\frac{U_G}{U_N}}{(1-\frac{19}{20}t)^2} \, dt.$$
Now we may use it to get

$$\frac{dG}{dt} = \frac{1 + \frac{U_G}{U_N}}{Q'(1 - \frac{19}{20}t)^2}. \quad (6)$$

This means that the derivative of $G$ with respect to $t$ has the same sign as $Q''$. The sign of $Q''$ seems to be negative for some range of $G$ as in the quadratic production function of Clotfelter (1985). Clotfelter (1985)'s example is $Q(G) = -cG^2 + bG + a$ and $G' = -c < 0$. Therefore, contrary to the result in Clotfelter (1985), we obtain the “negativity” of the impact of the tax rate on the charitable contributions in the utility maximization model.
IV. Empirical Analysis

1. Model and variables

1) dependent variable

The dependent variable is corporate giving, and the natural logarithm of corporate giving is used to derive the income elasticity of corporate contribution.

2) independent variables

① income (INC)

Net income of a company’s income statement is collected, and the natural logarithm of net income is used to derive the income elasticity of corporate contribution.

② tax rate (TAX)

As Boatsman & Gupta (1996) argue, the marginal tax rate is more appropriate than the average tax rate because the current tax system does not treat income and loss equally.

Trichotomous variable suggested by Shevlin (1990) is used as a proxy for the marginal tax rate. The trichotomous variable is calculated by using income and loss carryforward as follows;

(1) Positive taxable income and no carryforward

=> MTR = statutory tax rate

(2) Positive taxable income and loss carryforward or

No positive taxable income and no carryforward

=> MTR = 1/2 (statutory tax rate)
(3) No positive taxable income and loss carryforward

=> MTR = 0

③ advertising expenses (ADV)

The ratio of advertising expenses to sales is used to control the size effect of companies.

④ labor intensity (LAB)

Labor intensity is defined as the ratio of labor cost to the cost of goods sold.

⑤ debt-equity ratio (DER)

The ratio of debt to equity is used.

⑥ dividend changes (DIV)

Changes in dividends per share from the previous year are calculated.

⑦ one-year-ahead tax rate (TAX1)

This variable is included to capture dynamic aspects of the contribution decision.

Regressions are conducted by using the following basic model and an extended model.

Basic Model:

\[ \text{CON} = \beta_0 + \beta_1 \text{TAX} + \beta_2 \text{INC} + \epsilon. \]

Extended Model:

\[ \text{CON} = \beta_0 + \beta_1 \text{TAX} + \beta_2 \text{INC} + \beta_3 \text{TAX1} + \beta_4 \text{ADV} \\
+ \beta_5 \text{LAB} + \beta_6 \text{DER} + \beta_7 \text{DIV} + \epsilon. \]
2. Data

Financial data both for listed companies of the Korea stock (KOSPI) market and for the non-KOSPI companies are used for the analysis. These data are provided by the Korea Investors Service.

<Table 1> shows the descriptive statistics of the variables used in the estimation.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
<th>No of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td>Panel A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CON</td>
<td>18.972</td>
<td>2.557</td>
<td>11.695</td>
<td>26.242</td>
<td>1,277</td>
</tr>
<tr>
<td>TAX</td>
<td>0.2331</td>
<td>0.0466</td>
<td>0.11</td>
<td>0.28</td>
<td>1,333</td>
</tr>
<tr>
<td>TAX1</td>
<td>0.227</td>
<td>0.0439</td>
<td>0.11</td>
<td>0.27</td>
<td>1,333</td>
</tr>
<tr>
<td>Ln(INC)</td>
<td>23.656</td>
<td>1.75</td>
<td>14.859</td>
<td>30.487</td>
<td>1,333</td>
</tr>
<tr>
<td>ADV</td>
<td>1.249</td>
<td>2.0367</td>
<td>0.0004</td>
<td>12.263</td>
<td>1,333</td>
</tr>
<tr>
<td>LAB</td>
<td>5.785</td>
<td>4.998</td>
<td>0.183</td>
<td>47.311</td>
<td>1,333</td>
</tr>
<tr>
<td>DER</td>
<td>98.463</td>
<td>180.643</td>
<td>3.108</td>
<td>3537.615</td>
<td>1,333</td>
</tr>
<tr>
<td>DIV</td>
<td>12.886</td>
<td>62.503</td>
<td>-100</td>
<td>606.074</td>
<td>996</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Panel B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CON</td>
<td>16.601</td>
<td>2.2177</td>
<td>9.904</td>
<td>22.581</td>
<td>1,213</td>
</tr>
<tr>
<td>TAX</td>
<td>0.243</td>
<td>0.0362</td>
<td>0.11</td>
<td>0.28</td>
<td>1,462</td>
</tr>
<tr>
<td>TAX1</td>
<td>0.236</td>
<td>0.0335</td>
<td>0.11</td>
<td>0.27</td>
<td>1,462</td>
</tr>
<tr>
<td>Ln(INC)</td>
<td>21.761</td>
<td>1.3635</td>
<td>14.263</td>
<td>25.532</td>
<td>1,462</td>
</tr>
<tr>
<td>ADV</td>
<td>1.249</td>
<td>3.1546</td>
<td>0.0001</td>
<td>25.442</td>
<td>1,462</td>
</tr>
<tr>
<td>LAB</td>
<td>7.209</td>
<td>7.3691</td>
<td>0.482</td>
<td>66.094</td>
<td>1,462</td>
</tr>
<tr>
<td>DER</td>
<td>79.471</td>
<td>94.499</td>
<td>-483.055</td>
<td>1473.446</td>
<td>1,462</td>
</tr>
<tr>
<td>DIV</td>
<td>12.768</td>
<td>86.831</td>
<td>-100</td>
<td>1100.104</td>
<td>824</td>
</tr>
</tbody>
</table>
Data are collected for the period of 2001 – 2012. The total number of companies for the final data set is 2,490 after deleting companies with missing data. As Slemrod and Shobe (1990) argue, panel data are effective in analyzing the effect of changes in tax rates when there is a change during the period of analysis.

The number of companies within the KOSPI is 1,277, which is 51.29% of the sample, while 48.71% of the sample (1,213 companies) is from the non-KOSPI data.

3. Estimation methods and results

If the ordinary linear square (OLS) model is used for a simple pooled cross-sectional time-series model, consistent parameter estimates will not be provided when unobserved firm-specific characteristics have a unique but constant impact on the dependent variable. This result is due to an omitted variable bias. A fixed-effects model (FEM) overcomes this problem by accounting for individual firm heterogeneity through firm-specific constants in the model. These constants capture the effects of unobserved firm characteristics that vary firm by firm but are relatively stable over time for a given firm. However, an important limitation of the FE model is that it produces estimates that are conditional or sample-specific, and thus inferences from the FE model are not generalizable to observations outside the sample. This shortcoming can be overcome by a random-effects (RE) model, which views the individual-specific characteristics as a normally distributed random variable. However, the most significant limitation of RE model is that the RE model assumes that the individual-specific effects are uncorrelated with the regressors, which is often hard
to justify.

We will evaluate the model specification first before we discuss the estimation results. All three models are estimated. The test statistics show that both the FE model and the RE model outperform the simple-pooled model. The $\chi^2$ statistic associated with the likelihood ratio test of the equality of the FE model and the simple-pooled model supports the FE model. The $\chi^2$ statistic associated with the Lagrange multiplier test of the equivalence of the RE model and the simple-pooled model supports the RE model. And the Hausman $\chi^2$ statistic that tests whether individual specific effects are correlated with the regressors supports the FE model. Therefore, the estimation results will be discussed based on the FE model later on.

<Table 2> shows the estimation results for the basic model. The coefficient estimate of tax rate (TAX) shows the effect of tax rate on corporate contribution. The coefficient estimate is negative and statistically significant at 5% from the FE model.

The coefficient estimate of income is positive and statistically significant at 1% from all the models. The coefficient estimate represents the income elasticity of corporate contribution, and the elasticity is 0.981 from the simple-pooled model, 0.373 from the FE model, and 0.544 from the RE model, respectively. These values are higher than Boatsman & Gupta's (1996) estimate of 0.09 using firm-level panel data, but lower than Navarro’s (1988) estimate of 0.85 using firm-level cross-sectional data except from the simple-pooled model.
### Table 2: Estimation results (Basic Model)

<table>
<thead>
<tr>
<th>Panel Total</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Coefficient</td>
<td></td>
</tr>
<tr>
<td>I. Simple-Pooled Cross-section Time-series Regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAX</td>
<td>-0.143</td>
<td>(0.997)</td>
</tr>
<tr>
<td>Ln(INC)</td>
<td>0.981***</td>
<td>(0.0236)</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.546***</td>
<td>(0.638)</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.423</td>
<td></td>
</tr>
<tr>
<td>II. Fixed-Effects Regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAX</td>
<td>-1.627**</td>
<td>(0.748)</td>
</tr>
<tr>
<td>Ln(INC)</td>
<td>0.373***</td>
<td>(0.0331)</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>III. Random-Effects Regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAX</td>
<td>-1.281*</td>
<td>(0.759)</td>
</tr>
<tr>
<td>Ln(INC)</td>
<td>0.544***</td>
<td>(0.0301)</td>
</tr>
</tbody>
</table>

*** : significant at 1%, ** : significant at 5%, *: significant at 10%

<Table 3> shows the estimation results for the basic model and for the extended model with additional variables, which are one-year-ahead tax rate (TAX1), advertising expenses (ADV), labor intensity (LAB), debt-equity ratio (DER), and dividend changes (DIV). Advertising expenses (ADV) and labor intensity (LAB) are included as variables for profit maximizing model while debt-equity ratio (DER) and dividend changes (DIV) are included as variables for utility maximizing model.

After evaluating test statistics the same conclusion is obtained as was in the basic model estimation. That is, both the FE model and the RE model outperform the
simple-pooled model, and the FE model is superior to the RE model for both panel A and panel B. And tax rate and income have the same direction as in the basic model.

*Table 3* Estimation results (Fixed-Effects Regression)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Panel A(KOSPI)</th>
<th>Panel B(Non-KOSPI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic Model</td>
<td>Extended Model</td>
</tr>
<tr>
<td>TAX</td>
<td>-9.934 ***</td>
<td>-8.359 ***</td>
</tr>
<tr>
<td></td>
<td>(3.614)</td>
<td>(3.908)</td>
</tr>
<tr>
<td>TAX1</td>
<td>11.74 ***</td>
<td>8.296 **</td>
</tr>
<tr>
<td></td>
<td>(3.843)</td>
<td>(4.174)</td>
</tr>
<tr>
<td>Ln(INC)</td>
<td>0.400 ***</td>
<td>0.331 ***</td>
</tr>
<tr>
<td></td>
<td>(0.0576)</td>
<td>(0.059)</td>
</tr>
<tr>
<td>ADV</td>
<td></td>
<td>0.124 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.050)</td>
</tr>
<tr>
<td>LAB</td>
<td></td>
<td>0.065 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0295)</td>
</tr>
<tr>
<td>DER</td>
<td></td>
<td>0.007 ***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0015)</td>
</tr>
<tr>
<td>DIV</td>
<td></td>
<td>-0.0006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0007)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.068</td>
<td>0.077</td>
</tr>
</tbody>
</table>

*** : significant at 1% , ** : significant at 5% , * : significant at 10%

The results for Panel A are as follows. The coefficient estimate of one-year-ahead tax rate (TAX1) is positive and statistically significant at 5% for panel A. This is consistent with the estimation result of current tax rate (TAX). The estimation result for panel B is also consistent with that of TAX. Advertising(ADV) as a proxy of the
revenue has a positive impact, the labor intensity (LAB) as a proxy of the cost has a positive impact. Debt-equity ratio (DER) has a positive impact and the dividend changes (DIV) have a negative impact.

For the Panel B, we obtain the following results. Tax rate (TAX) and income (INC) are similar to those in the basic model. The tax rate (TAX) has a negative impact on contribution, and the expectation of the future tax rate (TAX1) has a negative impact on contribution without significance. Advertising (ADV) as a proxy of the revenue has a positive impact and the labor intensity (LAB) as a proxy of the cost has a negative impact. Debt-equity ratio (DER) has a negative impact and the dividend changes (DIV) have a negative impact.

The estimation results of the extended model can be summarized as the followings: The coefficient estimates of tax rate (TAX) and income (INC) are similar to those of the basic model. Among the variables added to the basic model, only the coefficient estimate of advertising expenses (ADV) is statistically significant at 1% and consistent with the hypothesis for panel A. All other variables do not generate any meaningful results. The coefficient estimate of one-year-ahead tax rate (TAX1) becomes statistically insignificant in the extended model.

V. Conclusion

We analyze both theoretically and empirically determining factors for a corporation’s donation. The results of theoretical study specify the role of the tax deduction limit in the relationship between the tax rate and corporate charitable giving.
When contribution is less than the deduction limit as in US, the tax rate has the neutral impact on contribution in the profit maximization model. However, when contribution is around the deduction limit as in Korea, the tax rate has a negative impact on contribution in the profit maximization model.

The results of empirical study show that it may be possible for tax policy to affect a corporation's donation under the condition that the total amount of donation from a corporation is not fully deductible due to the deduction ceiling. This result implies that a corporation's incentive to donate is affected by the relationship between the actual amount of total donation and the maximum amount of deductible donation. This finding has very important policy implication regarding a corporation's donation.

The important empirical finding of this study is that the existence of the statistically significant relationship between tax rate and corporate contribution should not be interpreted as the result supports only the utility maximizing model rather than the profit maximizing model. The results of both theoretical and empirical analysis show that tax policy could affect a corporation's contribution under the condition that the total amount of contribution is not fully deductible due to the deduction ceiling.
References


Harris, James, and Anne Klepper, Corporate Philanthropic Public Service Activities, New York: Conference Board, 1976.


