Research Paper

The Impact of Changes in Tax Incentives on Individuals' Charitable Contributions in Korea

December 2017

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Contents

Ⅰ. Introduction ····· 7

1. Research Background and Purpose ····· 7

Ⅱ. Status of Donation Deduction System ····· 10

1. Korea's Donation Deduction System ····· 10

A. Meaning and Types of Donations Under Current Tax Act ····· 10
B. Donation Deduction System Under Tax Laws ····· 13
C. Changes Due to Donation-Related Tax Law Amendments ····· 16
D. Aggregate Statistical Analysis of Donation Deduction ····· 20

Ⅲ. Impact of the Conversion of Donation Deduction System on Donation Behavior ····· 25

1. Analysis Using National Survey of Tax and Benefit ····· 25

A. Overview of Data for Analysis ····· 25
B. Analysis Strategy ····· 28
C. Analysis Results ····· 31
D. Findings ····· 39

2. Analysis Using Income Tax Returns Held by The National Tax Service ····· 41

A. Changes in Donation Activity in Income Tax Returns Held by The National Tax Service ····· 41
B. Leading Studies ····· 51

C. Estimation Model ····· 53
D. Data for Analysis ····· 57
E. Analysis results ····· 64

Ⅳ. Conclusion and Policy Implications ····· 75

References ····· 80

Appendix ····· 81

List of Tables

<Table II-1> Limits of deductible donation (based on the 2013 Income Tax Act) · 14
<Table II-2> Calculation of donation tax deduction ····· 15
<Table II-3> Limits of deductible donation ····· 16
<Table II-4> Tax treatment method of donations of taxpayers with their income type according to the conversion of donation deduction system ····· 18
<Table II-5> Marginal tax rate by range of income tax base ····· 19
<Table II-6> Effects of tax law amendments related to donations ····· 19

<Table III-1> Status of household and member of household by order of the NaSTaB ····· 27
<Table III-2> Basic statistics related to analysis of individual unit filing receipt for wage and salary income tax withholding ····· 33
<Table III-3> Results of estimating the impact of conversion of donation deduction system on individual donation activity ····· 35
<Table III-4> Basic statistics related to analysis of household unit of the NaSTaB ·· 37
<Table III-5> Results of estimating the impact of conversion of donation deduction system on household donation activity ····· 39
<Table III-6> Change in tax credit rate for donations ····· 42
<Table III-7> Direction of change by index before and after (2014 compared to 2013) donation-related tax amendments ····· 51
<Table III-8> Basic statistics ····· 58
<Table III-9> Yearly trend of donation-related variables ····· 59
<Table III-10> Trend of percentage of donors by income range ····· 59
<Table III-11> Trend of average deductible donation by income range ····· 60
<Table III-12> Trend of average deductible legal donation by income range ····· 60
<Table III-13> Trend of average deductible designated donation by income range ··· 60
<Table III-14> Yearly marginal tax rate ····· 61

<Table III-15> Explanation of key variables ····· 65

<Table III-16> Results of random effects probit regression of whether donation is paid ····· 67

<Table III-17> Fixed-effects (within) regression ····· 69

<Table III-18> Random-effects GLS regression ····· 70

<Table III-19> Results of random tobit regression of total deductible donation ····· 73

<Table III-20> Results of random tobit regression of deductible designated donations · 74

<Appendix Table 1> Results of estimating the impact of conversion of donation deduction system on individual donation activity: Repeated cross-sectional data analysis ····· 81

<Appendix Table 2> Results of estimating the impact of conversion of donation deduction system on individual donation activity: Balanced panel data analysis where income position is variable ····· 82

<Appendix Table 3> Results of estimating the impact of conversion of donation deduction system on household donation activity by sector ····· 83

<Appendix Table 4> Results of estimating the impact of conversion of donation deduction system on household donation activity by sector ····· 84

List of Figures

[Figure II-1] Trend of percentage of wage and salary taxpayers filing donations ·· 20
[Figure II-2] Donation amount and trend of applicants for donations deductions ··· 21
[Figure II-3] Percentage of applicants for donation deductions and trend of average donation amount ····· 22
[Figure II-4] Average donation amount of applicants for donation deductions and donation rate trend ····· 23
[Figure II-5] Trend of donation rate of applicants for donation deductions by tax base range ····· 24

[Figure III-1] Amount of donation and trend of applicants for donation deductions · 43
[Figure III-2] Percentage of applicants for donation deductions and trend of average donation amount ····· 44
[Figure III-3] Average donation amount of applicants for donation deductions and donation rate trend ····· 45
[Figure III-4] Trend of change in amount of donation by tax base range of income earner ····· 46
[Figure III-5] Trend of applicants for donation deductions by tax base range ····· 47
[Figure III-6] Percentage of applicants for donation deductions for income earners by tax base range ····· 48
[Figure III-7] Average donation amount of applicants for donation deductions by tax base range ····· 49
[Figure III-8] Trend of donation rate of applicants for donation deductions by tax base range ····· 50
[Figure III-9] Trend of deductible donation and donation price by income range ··· 62
[Figure III-10] Trend of donation price and deductible donation distribution by year ····· 63

I

Introduction

1 Research Background and Purpose

The social demand for public goods and public services continues to increase, with large concerns about the sustainability of national finances. The government's finances are not enough to meet the social demand, and it is impossible for the government to supply all the various demands in a timely manner. Therefore, the government has various policy incentive systems to supplement the various demands of the members of our society through the voluntary contributions of the private sector. In particular, in terms of income taxes, the government encourages individuals to voluntarily donate, providing tax benefits for voluntary donations.

In the meantime, the 2013 amended tax act changed the existing method of granting tax benefits for donations. As a result, starting from 2014, the income deduction for donations was changed to a tax credit in the Income Tax Act. At this time, the tax credit rate for donations was set at 15%.[1] For this reason, the income brackets whose marginal tax rate exceeds 15% has a higher tax burden than in the past. Regarding the amended tax act, some people have raised concerns that donations will be reduced by dampening voluntary donations by Korean households.[2] For example, Heon Jae Song (2013) estimated the donation

1) For 2014 ~ 2015, when the eligible donation exceeds 30 million won, tax credit rate of 25% was applied to the excess amount, and from 2016, the tax credit rate of 30% was applied to the excess amount when exceeding 20 million won.

price elasticity of Korean households at 7.5 ~ 9.9, and said that the effect of the amended tax act on the donation deduction could be significant. It is necessary to verify the concerns empirically using not only the past system, but also the statistics and information related to the donation under the new system. If the results of the empirical analysis verify the concerns as a fact, the requirement to supplement the system will be more persuasive.

On the other hand, Ki Baek Park (2010) derived the price elasticity of donations through cross-sectional analysis using the 2008 National Survey of Tax and Benefit of the Korea Institute of Public Finance. He estimated it using the Tobit model considering that the donation amount in the survey was zero in many cases. As a result of the estimation, the price elasticity of the donation amount was -0.564, whose statistical significance was low, and the income elasticity was estimated to be 0.720, which is meaningful. This result implies that the impact on donations of the conversion in the donation deduction system is negligible. It is difficult to forecast the conversion effect of the donation deduction system based on the results of the existing empirical analysis.

Therefore, in this study, we try to verify through post empirical analysis whether the conversion of the donation deduction system from income tax deduction to tax credit really dampened the donations of households and individuals in Korea. For this purpose, we first look at the provisions related to donations in the Income Tax Act, and examine the statistics related to donations provided in the Statistical Yearbook of National Tax. In addition, this study summarizes and suggests the issues, which were found in the process of verification and examination, that need to be improved in the policy review process.

The composition of this study is as follows. In Chapter II, we look at the provisions of the Income Tax Act on the donation deduction system. An empirical analysis strategy is established based on the results of comparative analysis of past and current provisions. Also in Chapter II, analysis will be made using aggregated data related to donations provided in the Statistical Yearbook of

2) The Maeil Business (June 6, 2015) reported that donations of office workers decreased by more than 500 billion won compared to 2013, and insisted the raise (http://news.mk.co.kr/newsRead.php?year=2015&no=584627, logged on July 8, 2016).

National Tax. In Chapter III, we identify and analyze the effects of the conversion of the donation deduction system using various level of personal and household data. In Chapter IV, we arrange the analysis results of the previous chapters, and summarize and suggest issues that need to be improved in the policy review process.

Ⅱ

Status of Donation Deduction System

1 Korea's Donation Deduction System

A. Meaning and Types of Donations Under Current Tax Act

The literal definition of donation is usually "money donated to help charitable or public works for nothing."[3] In tax law, donation is defined by applying the definition accepted by social norms. More specifically, donation under tax law is defined as "the value of a property gift that is paid free of charge to whom is not a related person without direct relations with business." In addition, the tax law includes "the amount of the difference between the transaction values and the market prices, which is deemed to be substantially donated, as the definition of donation; transferring an asset at a value lower, or purchasing an asset at a value higher than the normal amount value (market price ± 30%) to / from whom is not a special person without justifiable reason."

The current tax law classifies donations into the following types according to the presence of tax benefits or the presence of a limit to tax benefits. The tax benefits for donations here refers to the allowance for inclusion in necessary expenses and the tax credit. Donations for tax benefits include legal donations and designated donations as defined in the Income Tax Act, and donations to political funds and donations to employee stock ownership associations as defined

3) http://krdic.naver.com/detail.nhn?docid=5693300, logged on August 25, 2016.

in the Restriction of Special Taxation Act. Donations that do not receive tax benefits are called non-designated donations.

Legal donation means donations to which the exclusion provisions in Article 34 paragraph (1) of the Income Tax Act do not apply, donations in Article 24 paragraph (2) of the Corporate Tax Act, and the value of voluntary services, where a person has performed voluntary services to restore special disaster areas under the Framework Act on the Management of Disasters and Safety. The scope of the inclusion of legal donations in necessary expenses for those who have only business income is as follows. First, the inclusion of legal donations in necessary expenses is limited to the amount obtained by deducting a loss carried forward from the income generated in the relevant taxable period, and if the total legal donations exceed the amount obtained by deducting a loss carried forward pursuant to Article 45 from the amount of income generated in the relevant taxable period, such excess shall not be included in necessary expenses when calculating the amount of income generated in the relevant taxable period. Second, the amount in excess of the permissible limit in necessary expenses of donation, which are excluded from necessary expenses, can be carried forward over the next 5 years and may be included in necessary expenses within the limit of each taxation period. In this case, only if the legal donations disbursed during each taxation period are less than the permissible limit in necessary expenses for the period of taxation in each taxation period carried over must they be included in the necessary expenses as far as they are less than the permissible limit.

In accordance with Article 34 paragraph (1) of the Income Tax Act, a designated donation means to donate to organizations, such as social welfare foundations, cultural and artistic organizations, environmental protection organizations, religious organizations, etc. designated by the government in consideration of public interests, such as social welfare, culture, arts, religion, etc., and is the amount, under certain conditions or within certain limits, that can be included in necessary expenses. The scope of donations for the designated donation is described in Article 80 of the Income Tax Act. The permissible limit of inclusion of designated donations in necessary expenses for those who have only business income is calculated according to the presence of donations to religious organizations, and is as follows. First, when there is a donation

paid to a religious organization, it will be the sum of ① (Income of the relevant taxation period - total donations, etc.[4]) x 10/100 and ② the lesser of the amount of (Income of the relevant taxation period - total donations, etc.) x 20/100 or the amount paid other than to religious organizations. Second, when there is no donation paid to a religious organization, it will be (the income in the relevant taxation period - total donations, etc.) x 30/100. Amounts exceeding the permissible limit of the inclusion in necessary expenses can be carried over to each taxable period which ends within 5 years (three years before 2009) from the taxable period following the relevant taxable period, and included in necessary expenses. However, if designated donations in each taxable period carried over are less than the permissible limit of necessary expenses in Article 34 (1) of the Income Tax Act, they can be included in the necessary expenses as far as they are less than the permissible limit in necessary expenses.

Donations paid to political funds refer to donations to political parties (supporters' associations and the National Election Commission) under the Political Fund Act by a resident pursuant to Article 76 (1) of the Restriction of Special Taxation Act. For donations paid to political funds, the amount of 100/110 of donations up to 100,000 won, and 15/100 of amounts exceeding 100,000 won (25/100 of exceeding amount when the relevant amount exceeds 30 million won) can be credited against the tax calculated on global income. However, if a resident who is a business operator donates political funds, amounts exceeding 100,000 won must be included in expenses within the income after deducting a loss carried forward.

As donations to employee stock ownership associations are donations made by residents to stock ownership associations in Article 88 (4) of the Restriction of Special Taxation Act, those who have only business income can include it in the necessary expenses, and the limit of the amount is the relevant amount of income - (legal donations and others[5] + a loss carried forward)] x 30/100. Those who have income other than business income can be credited against

4) Total donations, etc., mean the sum of loss carried forward, political fund donation, legal donation, and employee stock ownership association donation.

5) "Legal donations and other" refers to the amount allowed as necessary expenses of legal donation and political fund donation (over 100,000 won).

the tax calculated on global income in Article 59-4 (4) of the Income Tax Act up to the permissible limit of necessary expenses.

Non-designated donations are ones that are not specifically prescribed in tax laws and are not fully recognized as expenses. Donations paid to alumni associations, graduates' associations, hometown associations and clan gatherings, and scholarships paid to students personally are non-designated donations, and are excluded from the necessary expenses and from deduction.

B. Donation Deduction System Under Tax Laws

1) Deduction System Before 2014 Tax Amendment

Prior to the amended 2014 Income Tax Act, in accordance with the 2013 tax amendment bill, income deductions were applied to donations and all residents with global income were eligible for income deduction. The donations deducted from global income include not only the donations of a person who is a resident, but also donations paid by a person subject to the basic deduction (any person who falls under Article 50 (1) 2 and 3 of the Act) in the taxable period. Deductible donations are limited to the amount obtained by deducting the necessary expenses of business income from legal donations, donations paid to political funds, donations to employee stock ownership associations, and designated donations, and the deduction limit is 14% of global income after including necessary expenses. The limits of the deduction coverage for each deductible donation type are as shown in <Table II-1>.

〈Table II-1〉 **Limits of deductible donation (based on the 2013 Income Tax Act)**

Donation	Limit
Legal donations and donations to political funds[6]	Global income in the relevant taxable period – loss carried forward
Donations to employee stock ownership associations	(global income in the relevant taxable period – loss carried forward – donation to political fund – legal donation – special donation – donation to employee stock ownership association) x 30/100
Designated donations	Where there is an amount donated to a religious organization (global income in the relevant taxable period – donation to political fund – legal donation – donation to employee stock ownership association) x 10/100 + MIN [global income in the relevant taxable period – loss carried forward] x 20/100, designated donation other than to religious organization] ② Where there is no amount donated to a religious organization (global income in the relevant taxable period – loss carried forward – donation to political fund – legal donation – special donation – donation to employee stock ownership association) x 30/100

Source: summarized by the authors based on the 2013 Income Tax Act and the Restriction of Special Taxation Act

2) Deduction System After 2014 Tax Amendment

The government announced plans to convert income deductions for donations to tax credits along with medical expenses and education expenses in the 2013 tax amendment bill to gradually convert income deductions into tax credits. As a result, the Income Tax Act was amended from January 1, 2014 in accordance with the tax amendment bill, and the income tax deduction system was converted into a tax credit system.

The tax deduction system according to the new Income Tax Act is as follows. First, those who have only business income are excluded from the tax credits, and they receive the same tax benefits as the existing ones with the provision of necessary expenses for donations. Next, for a global income earner (including wage and salary earner), excluding those who have only business income, where

6) Political fund donation means the amount more than 100,000 won, and the amount of 100/110 of the donation up to 100,000 won is tax credit deductible.

there is a donation[7] paid in the taxable period in Article 59-4 (4) of the Income Tax Act, 15/100 (30/100 of the exceeding amount, if the relevant amount exceeds 20 million won) of the amount calculated by subtracting the donation included in the necessary expenses from the sum of legal donation and designated donation must be credited against the tax calculated on global income[8] subject to the aggregate taxation in the relevant taxable period. In this case, if there are legal donation and designated donation at the same time, the legal donation must be deducted first, but if the donation paid before December 31, 2013 is carried forward beyond the taxable period commencing after January 1, 2014, and deducted from income, it must be deducted prior to donations made during the relevant taxable period.

〈Table II-2〉 **Calculation of donation tax deduction**

Donations given tax credits	Donation tax credits
Not more than 20 million won	15%
More than 20 million won	3 million won + (donation − 20 million won) x 30%

Source: summarized by the authors based on the 2016 Income Tax Act

The tax credit for donations is calculated as follows; ① (the amount for tax credit) x 15% (30%[9] if exceeding 20 million won) and ② (the tax calculated on global income) - (the less amount of the tax calculated on business income, if there is the donation included in the necessary expenses). The deduction limit for each donation is shown in <Table II-3>.

7) It includes donations made by spouses and dependents receiving basic deductions.

8) When there are donations included in the necessary expenses, the calculated tax on business income (= the calculated tax on global income * the business income / the gross income) is excluded.

9) By 2015, 25% was applied to the excess amount exceeding 30 million won of donations for tax credit, and 30% is applied to the excess amount exceeding 20 million won of donations for tax credit from 2016.

〈Table II-3〉 **Limits of deductible donation**

Donation	Limit
Legal donation and donation to political fund[10]	Global income in the relevant taxable period x 100%
Donation to employee stock ownership association	(global income in the relevant taxable period − donation to political fund − legal donation) x 30/100
Designated donation	① Where there is the amount donated to a religious organization (global income in the relevant taxable period − donation to political fund − legal donation − donation to employee stock ownership association) x 10/100 + MIN [global income in the relevant taxable period − donation to political fund] x 20/100, designated donation other than to religious organization] ② Where there is no amount donated to a religious organization (global income in the relevant taxable period − donation to political fund − legal donation − special donation − donation to employee stock ownership association) x 30/100

Source: summarized by the authors based on the 2016 Income Tax Act and the Restriction of Special Taxation Act

C. Changes Due to Donation-Related Tax Law Amendments

All past and current Income Tax Acts grant tax benefits to donations that residents made for public interest to encourage a donation culture by including donations in necessary expenses or allowing income deductions for donations paid in the relevant taxable period.

The method of including donations in necessary expenses is done when calculating business income, which is the same as in the past or current system. On the other hand, the tax deduction system was converted from the income deduction method to the tax credit method. That is, the donation deduction method under the former Income Tax Act was an income deduction method in which donations were deducted from the global income in the process of calculating the tax base. However, the donation deduction method under current Income Tax Act is a method of subtracting a donation tax credit from the tax

10) Political fund donation means the amount more than 100,000 won, and the amount of 100/110 of the donation up to 100,000 won is tax credit deductible.

calculated on global income in the process of calculating the final tax.

The tax treatment method of these donation-related tax benefits is determined by income type. First, those who have only business income could apply for either the method of inclusion in necessary expenses or the method of income deduction under the former Income Tax Act. In other words, those who have only business income received a tax benefit, choosing one method between inclusion in necessary expenses and income deduction according to their needs[11]. However, in the current income tax law, those who have business incomes are allowed only the method of inclusion in necessary expenses after the income deduction method is converted to the tax credit method. However, the method of inclusion in necessary expenses and the method of income deduction for donations have the same tax base. Therefore, the tax burden for those who have only business income is invariant between the former Income Tax Act and the current Income Tax Act. Next, those who do not have business income, such as those who have only wage and salary income, are covered only by the tax deduction system under both the former and current Income Tax Act. However, in the past, it was an income deduction method, but there is some difference; now it is a tax credit method. For the last type of income is for those who have both business income and other global income. They can apply for the method of inclusion of necessary expenses or the method of tax deduction together under both the former and the current Income Tax Act. However, In the past, it was an income deduction method, but there is some difference; now it is a tax credit method. The tax treatment method of donations according to the amended Income Tax Act is summarized by type in <Table II-4>.

11) For example, those who have only business income and must borrow from financial institutions may prefer the income deduction method for donations showing a large amount of income on the tax clearance certificate.

〈Table II-4〉 **Tax treatment method of donations of taxpayers with their income type according to the conversion of donation deduction system**

Item	Past	Current
(a) A resident with only business income	Inclusion in necessary expenses or income deduction	Inclusion in necessary expenses
(b) A resident with both business income and other global income (e.g., wage and salary, interest income)		Inclusion in necessary expenses + tax credit
(c) A resident with other global income but not business income (e.g., wage and salary earner or interest earner)	Income deduction	Tax credit

Source: summarized by the authors based on the former and current Income Tax Act

Next, let's look at how the conversion of tax deduction system for donations has changed the tax burden for taxpayers according to their income type. First, we should note that the methods of inclusion in necessary expenses and income deduction in the former Income Tax Act are the same in terms of the amount of tax paid because they have the same tax base. This means that the amended tax law does not change the tax burden for those who have only business income.

On the other hand, those who have global income other than business income, such as those with only wages and salaries, differ in the tax burden effect under the amended tax law by the marginal tax rate level as in <Table II-5> below. For the taxpayer class[12] with a marginal tax rate exceeding 15%, the past tax deduction method was favorable in terms of tax burden, because the present tax credit rate for donations is 15%. In terms of tax burden, the current tax credit method is favorable to the taxpayer class[13] with a marginal tax rate of less than 15%. For the taxpayer class that has a tax base between 12 million won and 46 million won, there is no difference in tax burden.

12) High-income class with tax base over 46 million won

13) Low-income class with tax base less than 12 million won

〈Table II-5〉 **Marginal tax rate by range of income tax base**

Range of tax base	Marginal tax rate
Not more than 12 million won	6%
12 million won ~ not more than 46 million won	15%
46 million won ~ not more than 88 million won	24%
88 million won ~ not more that 150 million won	35%
Over 150 million won	38%

Source: summarized by the authors using the provisions of Article 55 (1) of the Income Tax Act

The effects due to the donation-related tax law amendment by dividing the type of taxpayer into whether he is a wage and salary earner or is self-employed, are as shown in <Table II-6> below. In terms of tax burden, there is no effect on the self-employed with only business income due to the tax law amendments. On the contrary, the effect of the tax burden differs by class for wage and salary earners, and among them, high-income earners become disadvantaged. This implies that the 2014 tax law amendment resulted in tax discrimination by job status.

〈Table II-6〉 **Effects of tax law amendments related to donations**

Item	Past	Current	Change in amount of tax paid
Self-employed	Inclusion in necessary expenses or income deduction	Inclusion in necessary expenses	No change
Wage and salary earner	Income deduction	Tax credit	High income class: increase
			Middle income class: no change
			Low income class: decrease

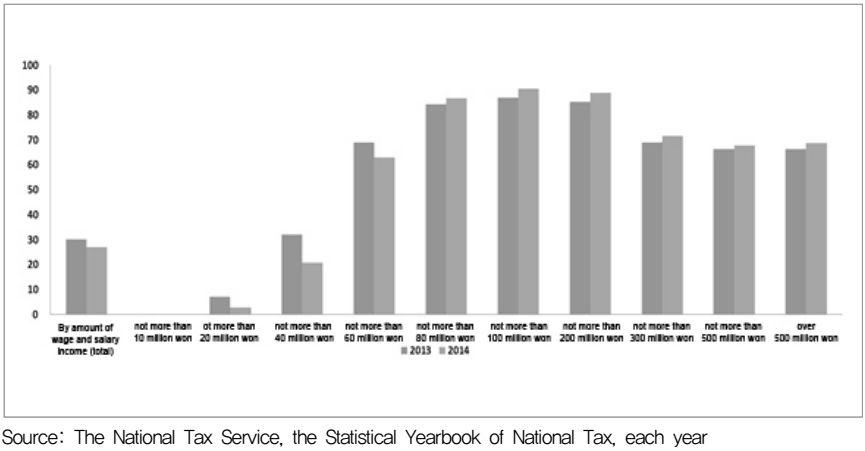
Source: summarized by the authors based on the former and the current Income Tax Act

D. Aggregate Statistical Analysis of Donation Deduction

The statistics for donations presented in the Statistical Yearbook of National Tax are as follows. First, the percentage of taxpayers filing donations among the total number of wage and salary taxpayers filing tax returns was 27.0% in 2014, which is 3.2%p points less than 30.2% in 2013. While the proportion of donors decreased in the range of global income of not more than 60 million won, the proportion of donors in the range of over 60 million won increased.

[Figure II-1] **Trend of percentage of wage and salary taxpayers filing donations**

(Unit: %)

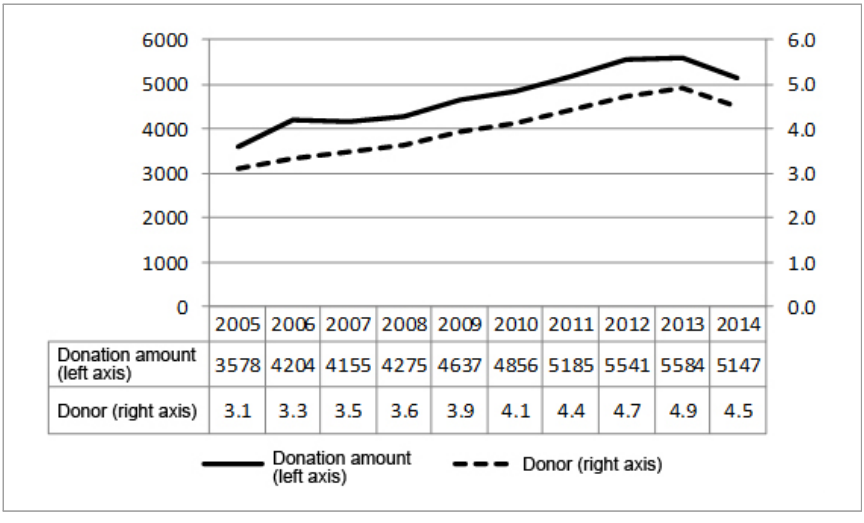


Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

Looking at the trends in donations as taxpayers' special deductions in the final tax returns over the past 10 years, it shows a drop in donations starting from 2014, when the system of income deductions (tax credit from 2014) for wage and salary earners changed. The total donation amounts deductible from income increased steadily from 3.6 trillion won in 2005 to 5.6 trillion won in 2013, but decreased to 5.1 trillion won in 2014. The number of donors who applied for income deductions also increased steadily, reaching 4.9 million in 2013 and dropping to 4.5 million in 2014.

[Figure II-2] **Donation amount and trend of applicants for donations deductions**

(Unit: billion won, million persons)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Donation amount (left axis)	3578	4204	4155	4275	4637	4856	5185	5541	5584	5147
Donor (right axis)	3.1	3.3	3.5	3.6	3.9	4.1	4.4	4.7	4.9	4.5

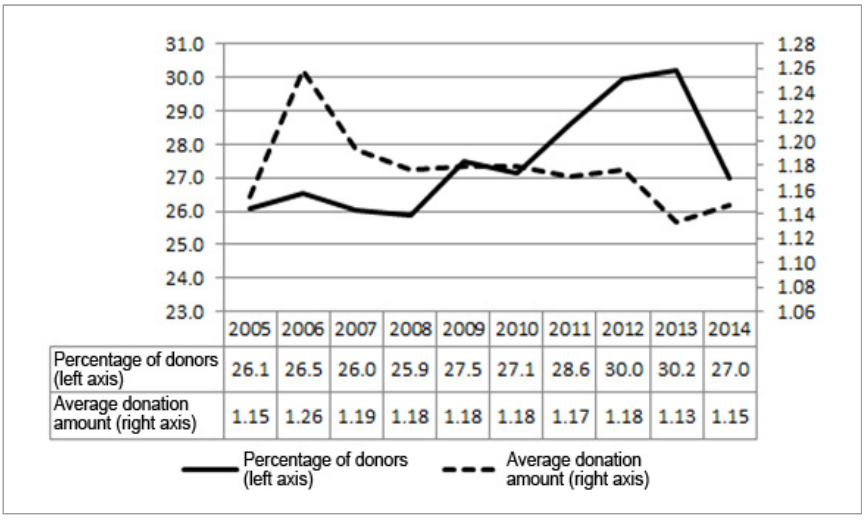
Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

The proportion of donors who applied for donation deductions among the filers of final tax returns also showed a change in trend along with the system change. The proportion of donors who applied for the donation deduction gradually increased from 26.1% in 2005 to 30.2% in 2013, and then dropped to 27.0% in 2014. It is difficult to judge whether this decline is due to system change or trend change.

On the other hand, average donation amounts per donor, which showed a gradual declining trend, increased slightly in 2014. The average donation amount was 1,260,000 won in 2006, the highest amount, then dropped to 1,130,000 won in 2013 and rebounded to 1,150,000 won in 2014. However, the amount of change in 2014 was very low at 20,000 won per year.

[Figure II-3] **Percentage of applicants for donation deductions and trend of average donation amount**

(Unit: million won, %)



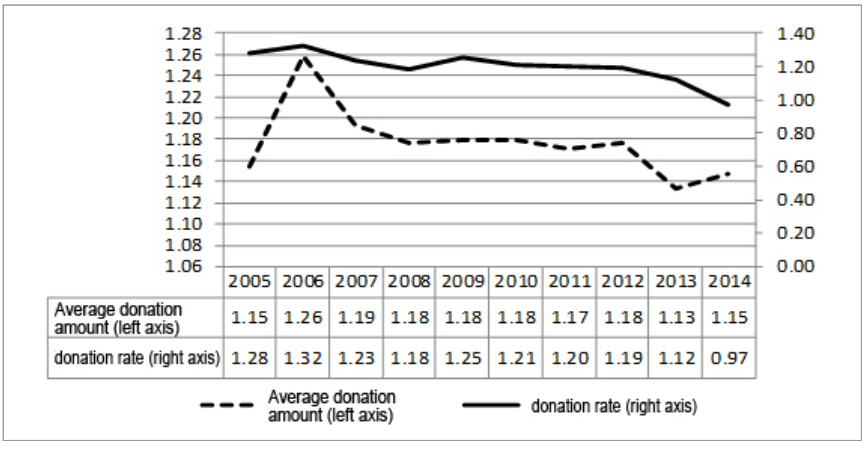
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percentage of donors (left axis)	26.1	26.5	26.0	25.9	27.5	27.1	28.6	30.0	30.2	27.0
Average donation amount (right axis)	1.15	1.26	1.19	1.18	1.18	1.18	1.17	1.18	1.13	1.15

Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

The declining trend of average donation amount by donation deduction applicants appeared with a decrease in the overall donation rate (donation amount / total wage). The donation rate has shown a declining trend entirely since 2005, and the trend continued in 2014 when there was the donation deduction-related tax amendment. In 2014, the donation rate finished 0.15%p points higher than the previous year (0.07%p points). As a result, the rise in the average donation amount in 2014 is attributed to income growth. We know that the average donation amount could have increased slightly because the total amount of wages increased to the point of offsetting a large drop in the donation rate.

[Figure II-4] **Average donation amount of applicants for donation deductions and donation rate trend**

(Unit: million won, %)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Average donation amount (left axis)	1.15	1.26	1.19	1.18	1.18	1.18	1.17	1.18	1.13	1.15
donation rate (right axis)	1.28	1.32	1.23	1.18	1.25	1.21	1.20	1.19	1.12	0.97

Note: Donation rate is the ratio (%) of donation amount to total wages and salaries of deduction applicants for donations

Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

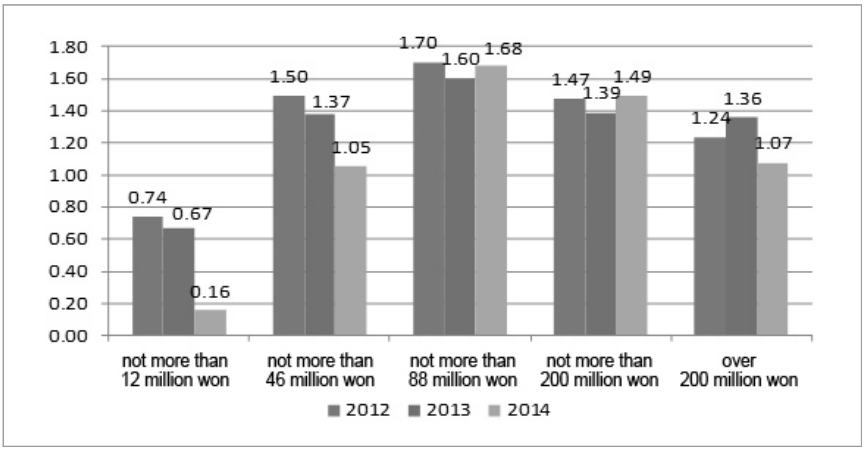
The donation rate, which is the ratio of the donation amount to the income level of donation deduction applicants in each tax base range, decreased significantly in the tax base class of less than 12 million won, and also decreased in the tax base class of 12 million ~ 46 million won. In particular, it seems that the declining trends in these two ranges stiffened from the year of system change (2014). These two ranges show that the donation price is maintained or has declined, which is not consistent with economic intuition, but the psychological effect of system change may have been strong.

On the other hand, in the tax base ranges of 46 million ~ 88 million won and 88 million ~ 200 million won, donation rates rebounded, unlike the previous year's drop. This result implies that there are other factors, because even though these are the ranges of an increased donation price, the donation rate increased.

A potential problem with this phenomenon is that the donation rate of the middle class, whose total donation amount is the highest in the tax base range between 12 million won and 46 million won, may decrease significantly, and donation activation may meet a limitation.

[Figure II-5] **Trend of donation rate of applicants for donation deductions by tax base range**

(Unit: %)



Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

Changes in donation-related indices before and after the donation-related tax amendments showed that the donation rate generally decreased. This shows that tax reform, reducing the benefits of donations, could have induced or deepened the decrease in donations. However, the changes in the donation rate in each tax base range imply that other factors may have played a larger role than the tax amendment effect. The reason is that the donation rate of those in the tax base range of 12 million won or less, which had a higher tax credit rate, fell sharply from the previous year. In addition, even in the tax base range of 12 million won ~ 46 million won, in which the tax deduction rate may be the same or rising, the donation rate dropped significantly compared to the previous year. On the other hand, the donation rate has increased in the tax range of 46 million won ~ 200 million won in which the rate of tax credit fell, and the tax benefits of donation decreased. The results imply that other factors brought on the effects, overwhelming the price cuts in the same classes.

Ⅲ

Impact of the Conversion of Donation Deduction System on Donation Behavior

This chapter empirically examines the effects of changes in the donation deduction system, which was amended in 2014, on the donation behavior of Korean households and individuals. The data used for empirical analysis are divided into two types according to their sources. The first data for analysis is the National Survey of Tax and Benefit of the Korea Institute of Public Finance. The second data for analysis is the income tax returns held by the National Tax Service. The characteristics of each data, empirical analysis strategies, and analysis results are presented below.

1 Analysis Using National Survey of Tax and Benefit

A. Overview of Data for Analysis[14)]

The National Survey of Tax and Benefit (NaSTaB) that is used in this study is empirical data collected by the Korea Institute of Public Finance to analyze tax and fiscal policies since 2008. One of the purposes for which the NaSTaB was designed is to analyze the impact of tax policies on the nation and

14) We has written referring to the National Survey of Tax and Benefit homepage (http://panel.kipf.re.kr/) and the Survey User's Guide of the 1st～8th years.

households, one of the economic subjects. The NaSTaB, which sets out the evaluation of tax policy as one of the data construction purposes, is characterized by collecting as many information items as are presented in the income tax return. Therefore, the NaSTaB has the strength of providing more information than other panel survey data in analyzing the effects of tax system changes on the decision making of households and individuals. Then, this study estimates the effect of changes in the donation deduction system using NaSTaB data.

The NaSTaB is carried out annually, and on-site inspections are carried out from the end of May to the end of September every year, during which individual taxpayers finish filing global income tax returns. The main survey method is face-to-face interviews by the investigator. Therefore, it is more reliable than a cross-sectional questionnaire method using telephones or the Internet.

The subjects of survey of the NaSTaB are divided into a household survey for householders and a household member survey for individuals recognized as household members. The households surveyed are general households, except for Jeju-do and island areas, which comprises 5,014 households at the beginning of the survey in 2008, the sum of original sample households and households included in 2009, and new households that moved out since 2009. A household member is basically defined as a family member who has lived together in a household for 6 months or more, but even if they have not lived together for 6 months or longer, elementary school and unmarried college students who have only moved out for the purpose of studying, except for graduate students, are recognized as family members. Among the household members, the ones surveyed are those who have income or are engaged in income activities and are 15 years old or older, and here income means wages and salaries, business income, real estate rental income, interest and dividend income, pension and insurance income, other income, and government cash subsidies. Even though the elderly are not economically active, they are included in the survey if they have pension income or property income. <Table III-1> summarizes the households and the number of households from the first to the eighth survey.

〈Table III-1〉 **Status of household and member of household by order of the NaSTaB**

Item	Households	Household members (person)
The 1st (2008)	5,014	6,919
The 2nd (2009)	5,039	7,095
The 3rd (2010)	4,830	6,981
The 4th (2011)	4,778	7,863
The 5th (2012)	4,740	7,298
The 6th (2013)	4,756	7,380
The 7th (2014)	4,807	7,559
The 8th (2015)	4,854	7,586

The questionnaire for the household survey consists of household basic status, status of owning automobiles and their value, status of household spending, status of individual transfer payments and income, welfare status, and status of assets and liabilities. The questionnaire also consists of economic activity, income and pension by income type, insurance-related expenditures, credit card and cash receipts, and income tax type and income deduction status.

The survey items related to donations are summarized as follows. First, it asks whether there was any donation spending in the last year. Then, for the households that answered that they have made donations to institutions rather than to individuals, it asks about the total amount for the year by donation area by each household member and the donation amount for each area. Here, the donation area consists of six major groups such as political parties, educational institutions, social welfare institutions, cultural arts, religious organizations, and others.

In summary, the NaSTaB has strengths in that it has repeatedly surveyed information on donations by donation area every year, and it provides detailed information on households and individuals affecting donations. There is also the strength of panel data that can control the characteristics of unobserved households because they are repeated every year. In particular, there is a strength to suit carrying out policy evaluation by conducting surveys before and after the change of the donation-related deduction system.

B. Analysis Strategy

The analysis using NaSTaB data is divided into two types according to the source of available information and the information collection unit. First, there is the analysis of individual units using the information of receipts for wage and salary income tax withholding. The NaSTaB collects these receipts from the responding households and provides a certain amount of cash in acknowledgment. The information collected on the receipts for wage and salary income tax withholding and the information on the NaSTaB are combined to analyze individual units. Second, it is an analysis of household units using information in the NaSTaB. Basically, decisions about donations over a certain size are likely to be made on a household level, and the economic status of households can affect donations. According to the tax law, not only donations by a person but also donations by those listed as dependents can be deducted. Considering this reality, the analysis of donation behavior should be done on a household level.

In this section, we use the difference-in-difference method to analyze the causal effects of system change when evaluating the effects of the conversion of donation deduction system on household and individual donations. Difference-in-difference is a method that calculates the difference between a treatment group and a control group that are affected by a policy before and after the introduction of the policy, and then estimates the average causality effect due to the policy, subtracting the difference before the introduction of the policy from the difference after the introduction of the policy. In this method, the policy or policy change introduced is called a treatment.

This difference-in-difference method has strengths in that it can control the pretreatment characteristics that exist between the two groups compared to the single difference method. In particular, the method has a strength in that it can control effects in accordance with individual characteristics, because analysis is performed for the same individual using the panel data. However, as noted by Chang Hui Kang et al. (2013), if the time of application is determined by the choice of individuals, the difference-in-difference estimates cannot be claimed as a causal effect of treatment. Therefore, when applying the method, the estimation strategy that secures the exogeneity of policy, that

is, an estimation strategy that controls the endogeneity of the treatment variable, is required.

When applying the difference-in-difference method to analyze the effect of the donation deduction system on donations of households or individuals, this section limits the household or individual to be analyzed to the wage and salary earner. Such an analysis approach is based on the fact that the motives for donating between self-employed and wage and salary earners may be different. In other words, the approach is done to control self-selection convenience, because the self-employed can donate regardless of system change if donating is advantageous to their own business. In addition, there are groups whether the treatment of the donation deduction system is applied or not, even where there is only wage and salary income as discussed in Chapter II. Therefore, there is no difficulty in analyzing the causal effect of treatment by applying the difference-in-difference method even if the analysis target is limited to the wage and salary earner.

The analysis in this section takes two additional measures to secure exogeneity between times of treatment. The first is about the time of analysis. We set 2012 as the pretreatment time because the conversion of the donation deduction system was announced in the 2013 tax amendment bill. This analysis time approach is based on the fact that from the second half of 2013, the NaSTaB respondents could fully anticipate system changes through the tax amendment bill. The analysis uses the sixth and eighth year survey data among the NaSTaB data. The second measure is that, among the three income classes mentioned above, we limited the wage and salary earners to be analyzed to those who did not move and had all data before and after the treatment. In other words, we analyzed the wage and salary earners who had no change in income class before and after the treatment. The reason is that the application of treatment is not randomly determined but can be determined by self-selection such as time working. We understand that the approach of sample selection properly controlled the endogeneity of treatment variables that might exist on an uncertain path.

Finally, for the analysis of household units, we limited the households to be analyzed to single earners with wage and salary income. The reason is that it is difficult to judge whether households are subject to treatment if several

household members generate income and the amounts of income are substantially different.

Therefore, the treatment group in this analysis is the classes whose tax burden increased due to the treatment of conversion of the donation deduction system among the households and individuals with wage and salary income, that is, the "high-income class" with a tax base of 46 million won or more and "low-income class" with a tax base less of than 12 million won. On the other hand, the control group is a "middle income group" with a tax base between 12 million won and 46 million won, whose tax burden is not changed among wage and salary earners, even though the treatment of conversion of the donation deduction system is applied.

Because individual unit analysis using receipts for wage and salary income tax withholding data has tax base information, it is easy to divide the individuals to be analyzed into a treatment group and control group using the information. However, the analysis of household units using NaSTaB data itself has information on total wages, but not on the tax base. This study takes notice that the difference between the total wage and the tax base mainly consists of income deduction items, such as wage and salary income deductions, personal deductions, and various social security contributions. The amount of the deduction that causes this difference depends mainly on the total salary level and the number of dependents. Using the individual unit analysis data, we divided the difference between the total wages and the tax bases into a total of 77 cells with 11 ranges for total wages and seven ranges for the number of households, and calculated the average difference of each cell. The households of the NaSTaB data were divided into the 77 cells mentioned above, and then the tax base was calculated by subtracting the average difference generated in the individual unit analysis data from the total wages of households in each cell. Based on the tax base, the treatment group and the control group were classified in the household unit analysis.

With this analysis strategy, the basic estimation model used in this section is as follows.

$$y_{it} = \beta_0 + \beta_1 D_{it}^1 + \beta_2 D_{it}^2 + \beta_3 T_t + u_{it} \; ; \quad u_{it} = \alpha_i + \epsilon_{it}$$

In the panel, the fixed effects model suggested above, i represents individuals or households, and t is an index indicating the time before (0) and after (1). The dependent variable y_{it} is defined as donation rate, and donation divided by income. D_{it}^1 and D_{it}^2 are variables that have a value of 0 for all i at the time before applying the treatment, and 1 only when belonging to each treatment group (low-income class and high-income class) at the time after applying the treatment.[15] Therefore, i belonging to the control group has a value of 0 even after applying the treatment. T_t is a dummy variable with a value of 0 at the time before the system change, and a value of 1 at the time after the system changes. α_i are all non-observable factors that affect the dependent variable, y_{it} which are time-invariant factors. ϵ_{it} is the normal net error term. If we estimate the coefficients of D_{it}^1 and D_{it}^2 by regression analysis of the above estimation model, this becomes the difference-in-difference estimate of each treatment group (low-income class and high-income class). That is, it represents an estimate of the average treatment effect (ATE) of the conversion of donation deduction system for each treatment group.

C. Analysis Results

1) Analysis of Individuals Who Submitted Receipts for Wage and Salary Income Tax Withholding

A) Basic Statistics

<Table III-2> shows basic statistics, such as averages and standard deviations of the sixth year and eighth year of the NaSTaB, for the main variables used to estimate the effect of the donation-related tax change on the donation behavior of the individuals who submitted receipts for wage and salary income tax withholding. A total of 1,874 individuals were included in the analysis, and they were classified as a low-income class with a tax base of less than 12 million

15) In the regression equation of the general DID model, it is the intersection term of dummy variable indicating the treatment group dummy variable and before-and-after treatment.

won and high-income class with a tax base exceeding 46 million won according to the tax bases of their households. As a result, the number in the low-income class sample is 1,000, the number in the high-income class sample is 140, and the remaining middle-income class is 734.

Four variables are included in the analysis, such as donations on the receipts for wage and salary income tax withholding, household donations on NaSTaB data, and incomes, which are same as the total wages on the receipts for wage and salary income tax withholding submitted by individuals. Income here means income calculated by subtracting temporary income such as the amount of prize, congratulations and condolences money, lump-sum payments of various pensions, etc. from individual gross income.

When looking at the amount of average donations on tax withholding receipts, we can see that it decreased in the eighth year compared to the sixth year in all classes. On the other hand, the average donation in the NaSTaB household data increased in all classes, unlike the average donation on the tax withholding receipts.

Meanwhile, the average donation rate (donation / total wage) generated by using the data on receipts for wage and salary income tax withholding shows that the income level of both the sixth and eighth year increased as the income class went up. The donation rate of the low-income class increased with time, but the donation rate of the middle-income class and the high-income class decreased slightly.

As the donation rate is defined in the NaSTaB as a percentage of the household donation against the total salary on the receipts for wage and salary income tax withholding, the donation rate of the low-income class and the middle-income class increased slightly with time, but the donation rate of the high-income class decreased.

〈Table III-2〉 **Basic statistics related to analysis of individual unit filing receipt for wage and salary income tax withholding**

(Unit: thousand won, %)

Variable	The sixth			The eighth		
	Low–income class	Middle–income class	High–income class	Low–income class	Middle–income class	High–income class
Total wage on the receipts for wage and salary income tax withholding	18,900	52,400	107,000	20,000	55,700	110,000
	(8,861)	(12,000)	(27,600)	(8,263)	(11,800)	(25,900)
Donations on tax withholding receipts	173	794	2,140	172	756	2,013
	(744)	(1,344)	(3,321)	(311)	(1,140)	(3,288)
Donations in the NaSTaB household data	276	716	1,730	283	761	1,780
	(971)	(1,525)	(3,090)	(1,016)	(2,238)	(3,483)
Income[2)]	21,600	54,100	115,000	23,200	57,900	115,000
	(17,900)	(13,100)	(57,600)	(13,800)	(13,500)	(30,200)
Donation rate 1	0.74	1.4	1.92	0.96	1.28	1.73
	(0.0336)	(0.0229)	(0.0290)	(0.0141)	(0.0184)	(0.0282)
Donation rate 2	1.48	1.28	1.55	1.5	1.3	1.47
	(0.0548)	(0.0279)	(0.0272)	(0.0541)	(0.0364)	(0.0292)
Number of samples	500	367	70	500	367	70

Note: 1. ( ) means standard deviation.
2. Income mean incomes calculated by subtracting temporary income such as the amount of prize, congratulations and condolences money, lump–sum payments of various pensions, etc. from individual gross income.
3. Donation rate 1 = donation on tax withholding receipt / total wage on tax withholding receipt
Donation rate 2 = donations in the NaSTaB household data / total wage on tax withholding receipt

Source: the sixth year and eighth year NaSTaB data

B) Analysis Results

This is an analysis of individual units using the information on receipts for wage and salary income tax withholding. <Table III-3> shows the results of estimation of the effect of the donation deduction system on individual donations with the difference-in-difference method. The dependent variables of models 1 and 2 are the donation rate that is the total donations on the receipts for wage and salary income tax withholding divided by total wages. The dependent variables of models 3 and 4 are the donation rate that is the donations in the

NaSTaB household data divided by total wages.

The reasons for using the separate information of the NaSTaB on the amount of donation are as follows. The donation deduction information on receipts for wage and salary income tax withholding has an inherent limit that makes it difficult to identify all donations made by an individual or his dependents. This is because there is a type of non-designated donation that cannot be deductible under the income tax Act, as explained above. In addition, the reason is that even for donations that can be deductible, there is a donation type with a deduction limit and no donation receipt is issued by the recipient of a donation, or there may be donations missing in the statement of donation. Therefore, prior to the system change, the donation on receipts for wage and salary income tax withholding was limited to providing only information on donations for income deduction and political fund donations for tax credit. There is also a problem in that it may include past donations that were deductible but carried over, exceeding the deduction limit.

Meanwhile, models 1 and 3 have no additional control variables, while models 2 and 4 use as control variables the incomes calculated by subtracting temporary income such as the amount of prize, congratulations and condolences money, lump-sum payments of various pensions, etc. from gross income.[16)]

Looking at the estimation results, all indicator variables (D_{it}^{1}, D_{it}^{2}) indicating whether the treatment was applied or not have the expected sign. The average treatment effect of the system changes on the high-income class, whose tax burden is increased, has a negative sign, while the average treatment effect of the system changes on the low-income class, whose tax burden is reduced by the treatment of the conversion of donation deduction system, has a positive sign. However, the effect of the average treatment of system changes on the high-income class was not statistically significant even under the 10% significance level in all models. This implies that the conversion of the donation deduction system has no causal effect for the high-income class, which leads to a decrease in the donation rate. The effect of the average treatment of system changes on the low-income class was statistically significant only in the case

16) The results were not significantly changed even though using gross income as a control variable.

of models 1 and 2, and only below the 10% significance level. This implies that the conversion of the donation deduction system for the low-income class may have a causal effect that leads to an increase in the donation rate. The results were maintained by varying the sample to be analyzed. For example, there is no negative (-) causal effect on the high-income class in the analysis of receipts for wage and salary income tax withholding information as repeated cross-sectional data or in the balance panel analysis where the income position is variable between two time points, and the positive (+) causal effect on the low-income class is statistically significant[17].

〈Table III-3〉 **Results of estimating the impact of conversion of donation deduction system on individual donation activity**

Explanatory variable	Model 1	Model 2	Model 3	Model 4
Low income treatment indicator Variable(D_{it}^1)	0.0034*	0.00329*	7.74e–05	–7.39e–05
	(–0.0020)	(–0.0020)	(0.0026)	(0.0026)
High income treatment indicator Variable(D_{it}^2)	–0.0008	–0.00088	–0.0009	–0.0012
	(–0.0037)	(–0.0037)	(0.0049)	(0.0049)
The eighth year dummy(T_t)	–0.0012	–0.00103	0.0001	0.0004
	(–0.0015)	(–0.0015)	(0.0019	(0.0020)
Income		–3.61e–11		–6.73e–11
		(–5.13E–11)		(6.65e–11)
Constant term	0.0109***	0.0124***	0.0141***	0.0169***
	(–0.0007)	(–0.0022)	(0.0009)	(0.0029)
Number of samples	1,734	1,734	1,734	1,734

Note: 1. ( ) represents the standard error, and ***, **, * mean statistical significance below the 1%, 5% and 10% significance level, respectively.
2. Income mean incomes calculated by subtracting temporary income such as the amount of prize, congratulations and condolences money, lump–sum payments of various pensions, etc. from individual gross income.

17) The results of this analysis are presented in 〈Appendix〉 Section 2.

2) Analysis of Households in the National Survey of Tax and Benefit

A) Basic Statistics

<Table III-4> summarizes the basic statistics for fiscal years 6 and 8 of the NaSTaB on key variables used to estimate the effect on household donations investigated in the donation-related NaSTaB. The households in the study exist in the sixth year and the eighth year, have neither business income nor real estate rental income, and are single earners with wage and salary income; only the households that did not have any income class change, and then the number of households in each surveying year is 528.

The variables included in the analysis are gross income, wage and salary income, net assets, number of household members and donations, and the net assets includes financial assets, real estate assets, housing assets, and other real estate assets. Looking at the average donation by households, the donation amount increased as the income class went up, and donations by income class decreased in all income classes in the eighth year compared to the sixth year. The variable of donation rate increased as the income class went up, and the donation rate by income class decreased in all income classes in the eighth year compared to the sixth year.

〈Table III-4〉 **Basic statistics related to analysis of household unit of the NaSTaB**

(Unit: 10 thousand won)

	The sixth			The eighth		
	Low-income class	Middle income class	High-income class	Low-income class	Middle income class	High-income class
Gross income	2,359.3	5,407.8	12,311.9	2,547.6	5,729.6	12,045.7
	(1,048.9)	(1,203.3)	(6,443.5)	(1,625.1)	(1,304.0)	(3,502.7)
Wage and salary income;	2,072.5	5,225.8	11,469.3	2,084.3	5,448.7	11,748.1
	(718.1)	(1,128.9)	(3,695.5)	(706.0)	(1,172.1)	(3,322.5)
Net assets	9,130.1	21,509.5	65,854.9	10,184.7	21,735.6	61,829.6
	(16,606.3)	(24,501.1)	(72,823.1)	(24,468.7)	(18,247.9)	(55,503.5)
Number of household members	2.28	3.17	3.60	2.33	3.30	3.58
	(1.28)	(1.20)	(0.86)	(1.36)	(1.19)	(0.86)
Donation	22.2	78.1	230.2	20.5	73.3	168.0
	(64.5)	(172.3)	(452.2)	(65.3)	(204.3)	(346.3)
Donation rate 1	0.0115	0.0145	0.0209	0.0096	0.0130	0.0148
	(0.0344)	(0.0302)	(0.0415)	(0.0297)	(0.0347)	(0.0325)
Donation rate 2	0.0087	0.0140	0.0198	0.0078	0.0125	0.0144
	(0.0264)	(0.0292)	(0.0401)	(0.0238)	(0.0334)	(0.0313)
Number of samples	243	223	62	243	223	62

Notes: 1. The variables in ( ) indicate the standard deviation, and ( ) of the number of samples is the number of net assets samples.
2. Donation rate 1 = donations in the NaSTaB household data / wage and salary income of the NaSTaB household data (total wage)
Donation rate 2 = donations in the NaSTaB household data / gross income of the NaSTaB household data

Source: sixth year and eighth year NaSTaB data

B) Analysis Results

In this section, using the NaSTaB data, we analyze the effect of the donation deduction system on household donations with the difference-in-difference method. Using the donation data obtained from the household survey is more advantageous than using the donation deduction data on the receipts for wage and salary income tax withholding as mentioned above, but there are

disadvantages as well. The advantage is that you can get donation information by household unit and get information about non-designated donations and donations exceeding the limit. The disadvantage is that there is the possibility of error due to the limitation that the questionnaire respondent does not accurately know information about the donations of all household members.

The NaSTaB data used in this analysis is based on the year 2014, when the tax law amendment was executed, and it uses the sixth survey data that includes information from 2012 and the eighth survey data that includes information from 2014. We excluded the seventh survey in 2013 from the analysis because of the possibility that people might have made a decision on donations in anticipation of system changes, given that the tax law amendment was announced in August 2013.

<Table III-5> shows the results when the effect of the donation deduction system on household donations is estimated with the difference-in-difference method. The dependent variables of models 1 and 2 are the donation rates defined by the sum of the contributions compared to household wage and salary income. The dependent variables of models 3 and 4 are the donation rates defined by the sum of the contributions compared to gross income. Meanwhile, models 1 and 3 have no additional control variables, while models 2 and 4 use gross income, net assets and number of household members as control variables.

Looking at the estimation results, the indicator variables, (D_{it}^1 , D_{it}^2), indicating whether the treatment was applied or not, were not statistically significant even under the 10% significance level in all models. This implies that the conversion of the donation deduction system does not have a causal effect on the household donation rate for the low-income class or high-income class. These results were maintained even when gross income, net assets and number of household members were controlled. In addition, performing the same work by donation type, no models showed a statistical significance even under the 10% significance level.[18] This indicates that the conversion of the donation deduction system does not have a causal effect on the total household donation rate as well as the donation rate of a specific type.

18) Analysis results are presented in 〈Appendix〉 Section 2.

〈Table III-5〉 **Results of estimating the impact of conversion of donation deduction system on household donation activity**

Explanatory variable	Model 1	Model 2	Model 3	Model 4
Low income treatment indicator variable(D_{it}^1)	−0.0004	0.0006	0.0005	0.0014
	(0.0027)	(0.0024)	(0.0025)	(0.0023)
High income treatment indicator variable(D_{it}^2)	−0.0047	−0.0021	−0.0040	−0.0018
	(0.0041)	(0.0038)	(0.0039)	(0.0035)
The eighth year dummy(T_t)	−0.0014	−0.0021	−0.0014	−0.0019
	(0.0019)	(0.0018)	(0.0018)	(0.0016)
Gross income		−1.73e−07		−5.20e−07
		(5.07e−07)		(4.75e−07)
Net asset		−2.68e−07***		−2.38e−07***
		(7.44e−08)		(6.97e−08)
Number of household members		0.0011		0.00076
		(0.0025)		(0.0023)
Constant term	0.0138***	0.0169**	0.0122***	0.0172**
	(0.0009)	(0.0074)	(0.0008)	(0.0069)
Number of samples	1,056	1,021	1,056	1,021

Note: ( ) represents the standard error, and ***, **, * mean statistical significance below the 1%, 5% and 10% significance level, respectively.

D. Findings

Using the NaSTaB data, we analyzed the effect of the conversion of the donation deduction system on the donation behavior of individuals and households with the difference-in-difference method. In particular, the difference-in-difference estimation controlled individuals or households to show the causal effect of treatment, that is, the conversion of the donation deduction system. Through this, we tried to properly control the indicator variables (D_{it}^1 and D_{it}^2) indicating whether the treatment was applied or not, and the endogeneity that may exist between error terms.

According to the results of individual analysis using the information on

receipts for wage and salary income tax withholding obtained from the NaSTaB, the average treatment effect of the system changes on the high-income class was not statistically significant even under the 10% significance level. This implies that the conversion of the donation deduction system has no causal effect for the high-income class, which leads to a decrease in the donation rate. The effect of the average treatment of system changes on the low-income class was only statistically significant in some models, and only below the 10% significance level. This shows that the conversion of the donation deduction system may have a causal effect for the low-income class that leads to an increase in the donation rate.

Meanwhile, according to the analysis of household units using NaSTaB data, the effect of the average treatment of system changes regardless of the income level was analyzed as not statistically significant even under the 10% significance level. Therefore, the analysis of household units implies that the conversion of the donation deduction system has no causal effect, which causes a decrease in the donation rate not only in the high-income class but also in the low-income class. The responses of the cross-sectional survey are helpful to find the reason for the above results. According to the same questionnaire survey, 74.0%of respondents answered that psychological motivation is the cause of the increase in donations over the past three years, and 77.5%of respondents said that the economic situation is important for the decrease in donations. On the other hand, the percentages of respondents who answered that tax benefits are important as the cause of increase or decrease in donations were only 13.1% and 39.3% respectively. This implies that donations by individuals or households depend on their own psychological motives or economic circumstances rather than tax benefits.

2 Analysis Using Income Tax Returns Held by The National Tax Service

A. Changes in Donation Activity in Income Tax Returns Held by The National Tax Service

Tax support for donations actually means a joint donation by the government and an individual to a donation receipt organization. The tax benefits for donations were converted from the previous income deduction method to the tax credit method on January 1, 2014, and the deduction rate (that is, the marginal tax rate), which was changed according to the income level was simplified (15% or 30%). The limit of the donation and the deduction rate are set depending on the party that receives the donation. The deduction for donations is set at 15% (30% for exceeding 20 million won) of the donation, and the donation limit amount is the entire amount for a legal donation and is changed for the designated donation according to whether it is given to a religious organization. When there is a donation to a religious organization, the limit amount is (10% of income + min (20% of the income or donation other than religious organization)), that is, 10% of the income; otherwise the limit amount is 20% of the income. When there is no donation to a religious organization, 30% of the income is given as a tax benefit. Comparing this with the system prior to the changes, the tax credit rate was lowered only for taxpayers who exceeded the tax base of 46 million won, and there is no change in the donation limit amount.

As a result of the system change, the benefits vary according to each income level; those whose taxation benefits are reduced are taxpayers with a tax base of more than 46 million won. Prior to the system change, the tax was deducted at a rate of 24% or more, which is the marginal tax rate of the income tax, but after the system change, the tax is deducted at a rate of 15%. If the donation is normal goods, taxpayers whose tax base is more than 46 million won and their donation price (i.e., one-tax credit rate) rises will decrease their donations, while taxpayers whose tax base is 12 million or less and their donation price declines will increase their donations.

〈Table III-6〉 **Change in tax credit rate for donations**

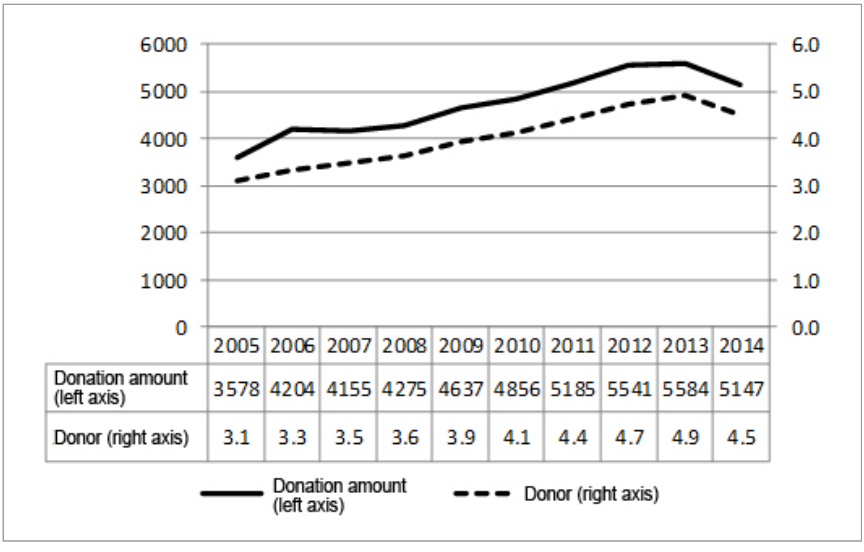
Tax base	(Income deduction) attributed in 2013	(Tax credit) attributed in 2014
~ 12 million won	6%	15%(30%)
12 million ~ 46 million won	15%	15%(30%)
46 million ~ 88 million won	24%	15%(30%)
88 million ~ 150 million won	35%	15%(30%)
Over 150 million won	38%	15%(30%)

Note: The numbers in parentheses are applied when the donation amount exceeds 20 million won, and the tax credit rate for 2013 income means the credit rate applied to the first 1 won of donation.

Looking at the trends in donations for special deduction applications in the Statistical Yearbook of National Tax, donations paid by wage and salary earners have been declining since 2014, when the income deduction system (tax credit after 2014) changed. The total donation amounts deductible from income increased steadily from 3.6 trillion won in 2005 to 5.6 trillion won in 2013, but decreased to 5.1 trillion won in 2014, and the number of donors who applied for income deductions also increased steadily, reaching 4.9 million in 2013 and dropping to 4.5 million in 2014.

[Figure III-1] **Amount of donation and trend of applicants for donation deductions**

(Unit: billion won, million persons)



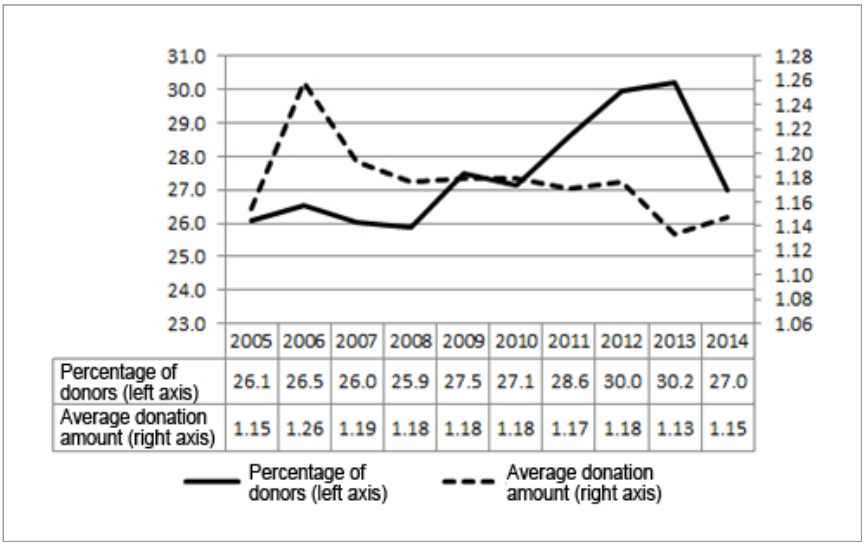
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Donation amount (left axis)	3578	4204	4155	4275	4637	4856	5185	5541	5584	5147
Donor (right axis)	3.1	3.3	3.5	3.6	3.9	4.1	4.4	4.7	4.9	4.5

Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

The proportion of donors who apply for deductions for donations among the filers of final tax returns also shows a change in trend along with system change. The proportion of donors who applied for donations gradually increased from 26.1% in 2005 to 30.2% in 2013, and then dropped to 27.0% in 2014. It is difficult to judge whether this decline is due to system change or is a trend change. On the other hand, average donation amounts per donor, which showed a gradual declining trend, increased slightly in 2014. The average donation amount was 1,260,000 won in 2006, the highest amount, then dropped to 1,130,000 in 2013 and rebounded to 1,150,000 won in 2014. However, the amount of change in 2014 was very low at 20,000 won per year.

[Figure III-2] **Percentage of applicants for donation deductions and trend of average donation amount**

(Unit: million won, %)



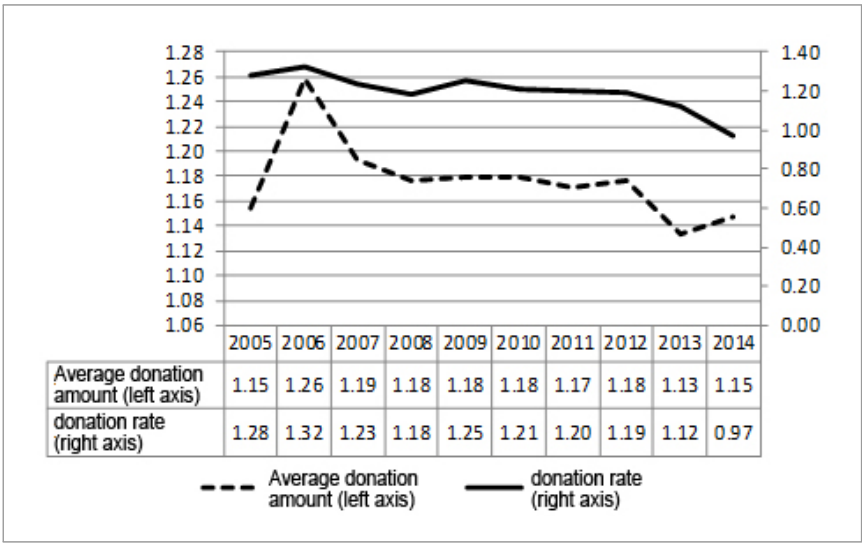
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percentage of donors (left axis)	26.1	26.5	26.0	25.9	27.5	27.1	28.6	30.0	30.2	27.0
Average donation amount (right axis)	1.15	1.26	1.19	1.18	1.18	1.18	1.17	1.18	1.13	1.15

Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

The declining trend of average donation amount paid by donation deduction applicants appears with a decrease in the overall donation rate (donation amount / total wage). The donation rate has generally shown a declining trend since 2005, and the trend continued in 2014, when there was the tax amendment related to deductions for donations. We know that the drop in the donation rate was 0.15%p points higher than the previous year with 0.07%p points. As a result, the increase in the average donation in 2014 was attributed to income growth. The average donation amount increased slightly because the total amount of wages increased to the point of offsetting a large drop in the donation rate.

[Figure III-3] **Average donation amount of applicants for donation deductions and donation rate trend**

(Unit: million won, %)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Average donation amount (left axis)	1.15	1.26	1.19	1.18	1.18	1.18	1.17	1.18	1.13	1.15
donation rate (right axis)	1.28	1.32	1.23	1.18	1.25	1.21	1.20	1.19	1.12	0.97

Note: The donation rate is the ratio (%) of donation amount to total wages and salaries of deduction applicants for donations

Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

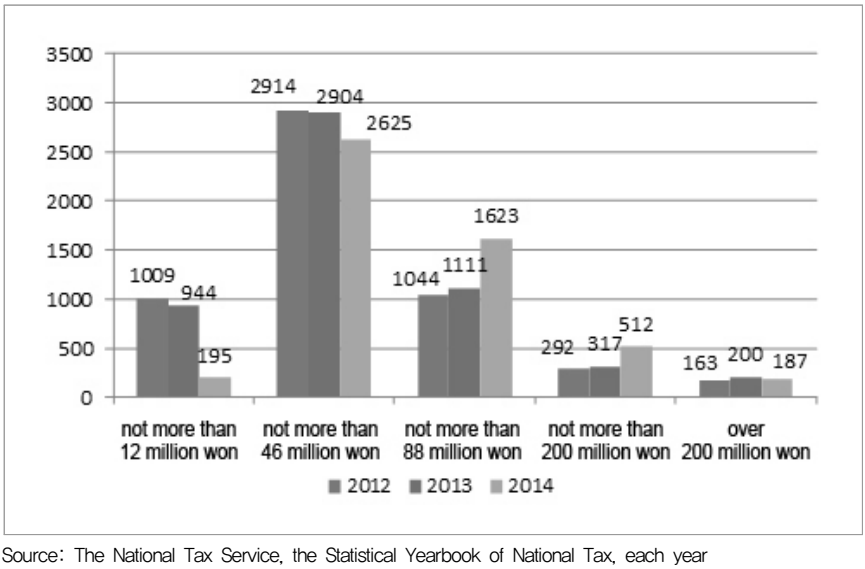
When looking at the change of donor and donation by tax base ranges to examine the effect of donation price change due to the change of the deduction system, we can see that while they were increasing overall, donations by the low-income class decreased sharply after the system change.

By tax base ranges, the amount of donation for income deduction applied by taxpayers continues the existing downward trend for those in the tax base range over 46 million won, and it continues an upward trend for those in the tax base range of 46 million ~ 200 million won. The amount of donations for those who in the tax base range under 12 million won dropped sharply, from 944 billion won in 2013 to 195 billion won in 2014. It fell sharply from the previous year even though the donation price of income earners in the same tax base range was lowered by the tax law amendment. For the income class with the largest donations, the taxpayers in the tax base range of 12 million

~ 46 million won, the decline of total donation also widened. Even in the range where the donation price may not change or decrease, total donations in 2014 decreased by 280 billion won, from 2.9 trillion in the previous year to 2.6 trillion won.

[Figure III-4] **Trend of change in amount of donation by tax base range of income earner**

(Unit: billion won)



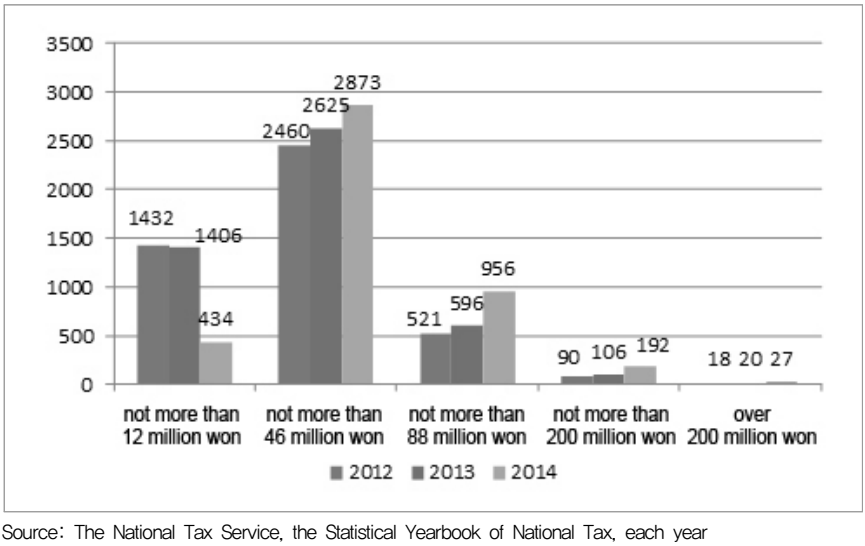
Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

The size of applicants for donation deductions also sharply decreased at the tax base below 12 million won. The size of deduction applicants decreased slightly from 1.43 million in 2012 to 1.40 million in 2013, further dropped to 430,000 in 2014 after the system was changed. For the income earners of the tax base under 12 million won, the decrease in size of deduction applicants is not consistent with the economic intuition, because the decrease occurred in the situation where their tax benefits were being increased as the deduction rate was increased from 6% to 15%, and due to that, the income deduction system for donation was converted into tax credit system. On the other hand, the number

of deduction applicants for donation with a tax base of more than 46 million won, whose tax benefits were decreased due to the system change, continued to increase, which shows that the effect of tax price on donations may not be significant. In particular, for income earners with a tax base between 46 million won and 88 million won, the number of deduction applicants for donation has soared from 596,000 in 2013 to 956,000 in 2014, which is a significant increase compared to the previous year's increase.

[Figure III-5] **Trend of applicants for donation deductions by tax base range**

(Unit: thousand persons)



Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

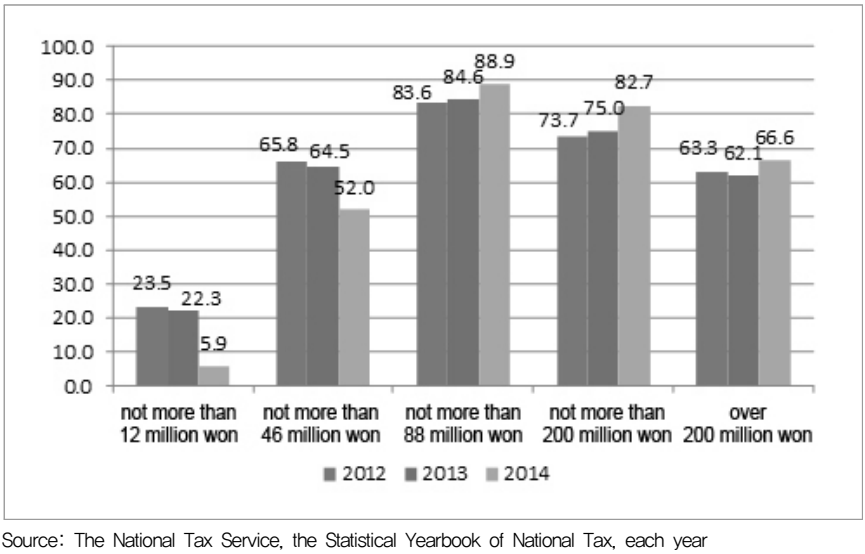
The proportion of deduction applicants for donation to income earners shows the opposite effect to the economic intuition on the change in donation prices. That is, the proportion of donors to the income earners with a tax base below 12 million won, whose donation price has fallen, was decreased to 5.9% in 2013 from 22.3% in 2012. On the other hand, the percentage of donors with a tax base of 88 million won ~ 200 million own, whose donation price has increased, was significantly increased to 82.7% (2014) from 75.0% (2013). The

proportion of donors whose tax base exceeding 200 million won was significantly increased to 66.6% in 2014 from 62.1% in 2013.

On the other hand, the average donation amount of deduction applicants for donation shows a decreasing tendency in most classes. For income earners with a tax base under 200 million won, the average donation amount has decreased since 2012, and the size of decrease in average donation amount slightly increased due to the 2014 tax amendment for donations. For income earners with tax bases of 46 million won ~ 88 million won and 88 million won ~ 200 million won, where the proportion of donors is high, the average donation amount has fallen to 1.7 million won and 2.7 million won in 2014, respectively, a drop of around 10%, from 1.9 million won and 3.0 million won in 2013. However, for income earners with a tax base exceeding 200 million won, the average donation amount decreased by more than 30% in 2014. The average donation amount of 10.1 million won in 2013 increased from 2012 (9.1 million won) has decreased to 7.0 million won in 2014.

[Figure III-6] **Percentage of applicants for donation deductions for income earners by tax base range**

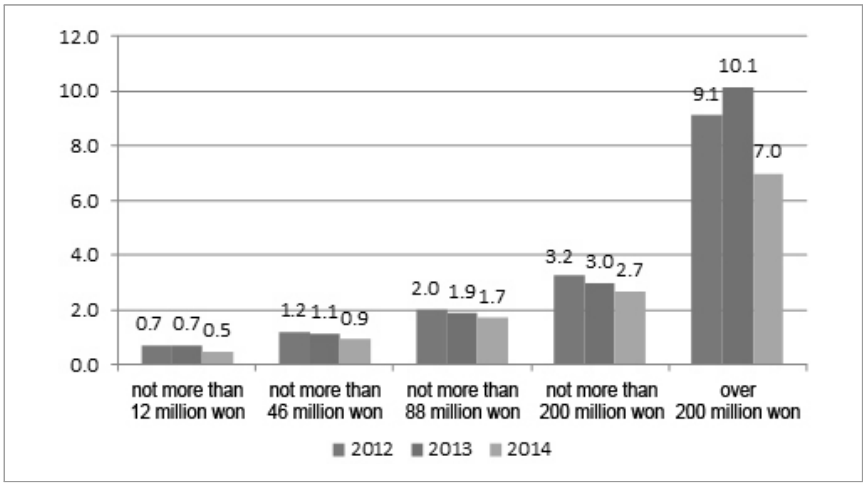
(Unit: %)



Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

[Figure III-7] **Average donation amount of applicants for donation deductions by tax base range**

(Unit: million won)



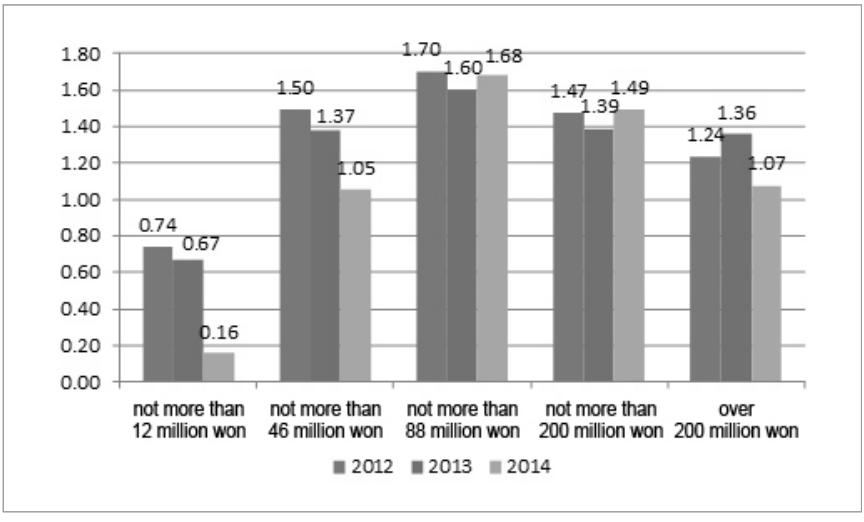
Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

The donation rate, which is the ratio of the donation amount to the income level of deduction applicants for donation, decreased significantly for those in a tax base less than 12 million won, and in the class of tax base 12 million won ~ 46 million won also continued to decrease. It seems that the declining trends in these two ranges have been stiffened from the year (2014) of system change. This is not consistent with the economic intuition because the range is where the donation price is maintained or declined, but the psychological effect of system change may have been strong. On the other hand, in tax base ranges of 46 million won ~ 88 million won and 88 million won ~ 200 million won, donation rates rebounded unlike the previous year's drop. This implies that there are other factors, because the donation rate increased even though these are the ranges of increased donation price.

A potential problem of this phenomenon is that the donation rate of the middle class, whose total donation amount is the highest, have a tax base ranging between 12 million won and 46 million won, may have decreased significantly, and the activation of donation may meet the limitation.

[Figure III-8] **Trend of donation rate of applicants for donation deductions by tax base range**

(Unit: %)



Source: The National Tax Service, the Statistical Yearbook of National Tax, each year

Changes in donation-related indices before and after the donation-related tax amendments have decreased all of the total donations, the number of donors, the proportion of donors, the average donation amount, and the donation rate. Among them, the indices that differed from the previous year's trend are total donations and the number of donors, which were increased in 2013 and then dropped in 2014. This shows that the tax amendment, reducing the benefits of donations, could have induced or deepened the decrease in donations.

However, the index changes in each tax base range implies that other factors may have played a larger role than the tax amendment effect. All donation-related indices of those in the tax base range of 12 million won or less fell sharply from the previous year. Even in the tax base range of 12 million won ~ 46 million won, in which the tax deduction rate may be the same or rising, total donations, the proportion of donors, the average donation amount, and the donation rate dropped significantly compared to the previous year. This implies that other factors brought effects that overwhelmed the price cuts in same classes.

On the other hand, the proportion of donors and the donation rate have increased in the tax range of 46 million won ~ 200 million won, where the rate of tax credit fell and the benefit of donation was decreased. Despite the reduction in benefits for donations, the proportion of donors increased, and the donation rate (donations / total wages) also increased, and then total donations increased. The decrease in average donation amount can be explained by the increase in donation price. For those with a tax base over 200 million won, the donation rate increased, but the total donation decreased due to the drop in the donation rate and decrease in the average donation amount. The average donation amount has changed in the direction suggested by the increase of donation prices.

〈Table III-7〉 **Direction of change by index before and after (2014 compared to 2013) donation-related tax amendments**

Tax base range	Total donation amount	Number of donors	Proportion of donors	Average donation amount	Donation rate
~ 12 million won	decreasing	decreasing	decreasing	decreasing	decreasing
12 million ~ 46 million won	decreasing	increasing	decreasing	decreasing	decreasing
46 million ~ 88 million won	increasing	increasing	increasing	decreasing	back to increase
88 million ~ 200 million won	increasing	increasing	increasing	decreasing	back to increase
Over 200 million won	back to decrease	increasing	back to increase	back to decrease	back to decrease
Total	back to decrease	back to decrease	decreasing	decreasing	decreasing

Note: '~ing' means that the change trend in 2013 is maintained in 2014 compared to 2012, and 'back to' means that the change trend in 2013 is reversed from 2012.

B. Leading Studies

The study of the effects of income tax system on donations has been of policy interest for a long time, and much research has been done on it. Foreign studies have developed from analyzing simple price effects in the past to the direction of the inter-temporal decision making, the division of permanent

income and transitory income effects, etc. In Korea, research on donations is still at a simple analysis of price effects due to the limited provision of relevant data.

The leading studies on Korea are Heon Jae Song (2013) and Ki Baek Park (2010). Ki Baek Park (2010) derived the price elasticity of donations through cross-sectional analysis using the 2008 National Survey of Tax and Benefit of Korea Institute of Public Finance. He used the Tobit model considering that the donation amount in the survey was zero in many cases. As a result, the price elasticity of donations was -0.564, whose statistical significance was low, and the income elasticity was estimated to be 0.720. Heon Jae Song (2013) also derived the price elasticity of donations using the 2008 ~ 2012 National Survey of Tax and Benefit data (surveying 5,000 households every year) of the Korea Institute of Public Finance. Among the survey data, only those who submitted their withholding tax receipts were used as an analysis object, which resulted in 5,985 submittals by 2,122 workers for five years. The analytical model was a Random Effect Tobit model, and the analysis results showed that the price elasticity of donations was -7.5 ~ -9.9 and the income elasticity was very high at 1.4 ~ 1.8.

Feldstein and Taylor (1976) estimated the price elasticity of donations by analyzing the cross-sectional analysis and the change rate analysis by income spectrum between two periods based on the tax returns filed in the US Treasury in 1962 and 1970. They suggested that the price elasticity of donations is between -1.0 and -1.5 through Tobit model estimates.

Clotfelter (1980), based on filed US tax returns data, compared the effect of taxpayers, who are at the boundaries of itemized deduction, on the price elasticity of donations and the short- and long-term price elasticity using panel data. The results of the estimation show that taxpayers at the boundaries of itemized deduction affects toward reducing the size of the total price elasticity, and the response to the price of donations appears gradually, and therefore the long-term elasticity is higher than the short-term elasticity. The price elasticity was estimated to be approximately -1.

Randolph (1995) shows that taxpayers are adjusting the timing of donations, using filed US tax returns reporting data panel (1979-1988). In other words, the study shows that a donation amount is adjusted according to the transitory

income and the price change; not considering this, the income elasticity is underestimated and the price elasticity is overestimated.

Auten, Sieg and Clotfelter (2002) divided the changes in price and income as persistent and transitory factors using the US income tax return data panel (1979-1993), and estimated elasticity based on them. The price elasticity to the persistent price change was estimated as -0.79 ~ -1.26, and the donation elasticity of the transitory price change was estimated as -0.40 ~ -0.52. On the other hand, the income elasticity is 0.40 ~ 0.87 for the persistent change and the elasticity for the transitory change is 0.29 ~ 0.49.

Bakija and Heim (2011) estimated the elasticity allowing future expectations and gradual adjustment to tax changes, using the US income tax return data panel (1979-2006). The donation elasticity for the persistent price change estimated based on the donation price difference by states showed a value (absolute value) larger than -1, and the estimated value based on the change of the Federal tax showed a relatively small value (absolute value) of elasticity. The price elasticity was estimated to be within a range of -0.6 ~ -1.1, when considering the Federal tax and changes by states together.

The above results show that there is considerable difference in the price elasticity of donations between Korea and the United States. This implies that the causes are the difference in personal income tax system and the difference in the data used in the estimation (survey data vs. tax return data), but the difference may be cultural differences on donations between the East and West.

C. Estimation Model

In the study, the estimation model to estimate the elasticity of donations can be derived from the solution of the utility maximization problem of individuals like Auten, Sieg and Clotfelter (2002). In other words, when an individual utility function, ($U(\cdot)$), is defined as a function of donation, (G_t), and consumption, (C_t), having a time separable feature, individual decision making will be done based on the expected utility determined along the future path of donation and consumption. Here, the inter-temporal difference of future utility is adjusted by the discount rate, β.

$$E_t\left\{\sum_{s=t}^{\infty}\beta^{s-t}U(G_s, C_s)\right\}$$

The budget constraint equation that restricts the individual utility function is given for each period as follows. That is, as the inter-period total income equilibrium, it is the budget constraint equation that the sum of consumption, donation, and assets carried over to the following year in year t is equal to the sum of previous years carried over assets and incomes after tax in the relevant year.

$$C_t + G_t + W_{t+1} = (1+r_t)W_t + Y_t - T_t(r_t W_t, Y_t, G_t)$$

Here, W_t is the asset held at the beginning of t, r_t is the interest rate, and the tax burden function, $T_t(\bullet)$, is the function that determines the tax according to the capital income, $(r_t W_t)$, the labor income, Y_t, and the donation, G_t.

When the first-order condition to maximize the expected utility is derived, the optimum resource allocation condition within a time is that the marginal utility ratios of consumption and donation should be the same, respectively, as the price ratio. In other words, the expenditure level should be determined so that the marginal utility per expenditure of 1 won is the same as the activity of consumption and donation; it can be expressed in the following equation.

$$(1-\tau_t)\frac{\partial U}{\partial C_t} = \frac{\partial U}{\partial G_t}$$

In the above equation, $(1-\tau_t)$ is the price of donations, which is (1 - the marginal tax rate applied to donation deductions); which is the item to adjust the impact of donations that reduce taxes through general consumption and income deductions after tax payments.

The optimal conditions for determining the inter-temporal consumption level can be derived from the Lagrange multiplier, the potential price of the budget constraint equation. The inter-temporal relationship of the Lagrange multipliers satisfying the optimal condition is that the expected values, applying the after-tax

interest rate to the potential price of the current budget constraint and the potential price of the future budget constraint, should be the same.

$$\lambda_t = E_t(R_{t+1}\lambda_{t+1})$$

Here, $R_t = (1+(1-\tau_t)r_t)$, and $\lambda_t$is the Lagrange multiplier. The optimal consumption,(C_t^*, G_t^*)derived through two first-order conditions is estimated using the linear approximation, because it is not derived by the close-form. The most commonly used form of linear approximation is the log-log equation.

Ki Baek Park (2008) and Heon Jae Song (2013) estimated the optimal donation amount using the log-log linear approximation like below.

$$\ln(g_{i,t}) = \alpha_t + \beta_1 \ln(Y_{i,t}) + \beta_2 \ln(P_{i,t}) + \gamma Z_{i,t} + \epsilon_{i,t}$$

Ki Baek Park (2008) applied this model to the entire survey data, and Heon Jae Song (2013) constructed the panel model for the taxpayers who submitted the income tax returns and used Heckman two-stage model to consider the sample selection problem. In the first step, they decided whether to submit income tax returns, reflecting the distribution, and estimated the donation model in the second step.

Bakija and Heim (2011) included variables of past and future rate of changes in income and price to fully reflect the dynamic nature of donation expenditures (i.e., the replacement possibility of donation spending by time).

This study estimated the same log-log model as the leading studies.[19] Based on the Tobit model, we used the Heckman two-stage model, including the decision process of whether to make a donation, to reflect the situation that about 55% of total wage and salary earners applied for donation deductions.[20]

19) The differences-in-differences model, which are difficult to reflect the sample selection bias and the time lag effect of the donation price (the shift effect between the donation times), is excluded in the review model. The result of actual simple difference-in-difference analysis showed that the price elasticity of the donation was positive (+), which is not consistent with the economic intuition.

20) We estimated using the Heckman Two-Stage model to check whether restoring the distribution of total donation expenditures cause another error because the proportion of donors is as low as 56%.

$$\ln(g_{i,t}) = \alpha_t + \beta_1 \ln(Y_{i,t}) + \beta_2 \ln(P_{i,t}) + \gamma Z_{i,t} + \epsilon_{i,t}$$

In the first stage of the Heckman two-stage model, to identify from the second stage estimation model in estimating the Probit model, which whether donations are paid is a dependent variable, the variable used as a exclusion variable is the head of household variable. Whether a person is head of household may have a significant association with whether a major income earner of the household apply for the donation deduction. That is, the reason is that the head of household can apply for the donation deduction summing up donations paid by qualified family members for deduction including minor children. However, the relationship between whether a person is a head of household and the donation deduction amount is relatively low. The donation deduction applied amount is largely influenced not only by the income level but also by the income of the spouse or other family members. In particular, the reason is that the incentive for summing up deductions to a head of household to reduce tax burden does not exist, because the tax credit effect is the same regardless of income level according to the conversion to tax credit from 2014[21]. In the second stage, we estimate the model by adding the distribution random variable (i.e., Inverse Mill's ratio) of the donation applicant to the income earner whose donation deduction application amount has a positive (+) value.

In addition, we analyze the model that reflects the specificity of the income reporting process in Korea. This model is based on the hypothesis that the relevant year's donation is affected by the previous year's income. This is to reflect the fact that the final tax return and the refund for the previous year's tax for wage and salary income is made in the year (February to March) after the year of earning income. It is because taxpayers may not be able to accurately understand the effect of tax burden changes for the donation in the reality that various deduction systems are operated, and in many cases, the total salary is not confirmed in advance. In this case, the income earners in Korea check the

21) Of course, the variable whether a taxpayer is the head of household has a certain correlation with the donation deduction applied, but it is difficult to find a better exogenous variable in the income tax return data.

final tax return and the refund result at the beginning of the year, and decide the amount of donation based on this.

$$\ln(g_{i,t}) = \alpha_t + \beta_1 \ln(Y_{i,t-1}) + \beta_2 \ln(P_{i,t-1}) + \gamma Z_{i,t} + \epsilon_{i,t}$$

D. Data for Analysis

The data used for the analysis of the donation price elasticity was extracted from the income tax returns (the final tax returns) held by the National Tax Service. Specifically, all income earners were sampled at regular intervals after sorting by income level. As a result, we have set up a panel data of 100,000 people per year, that is, a total of 500,000 data entries, for income attributed in years 2011 ~ 2015.

Variables included in the data are donation-related variables, such as total donations, legal donations and deductible amount of designated donations, and variables related to the attributes of wage and salary earners, such as gross wages, age, sex, and the number of personal deductions. However, it has the limitation that cannot include other variables that can affect the donation related decision such as the size of the household, because it contains only the data necessary for the tax calculation among the income tax return data.

According to the basic statistics of the sampling data, the average salary of the wage and salary earners for 5 years is about 51 million won, the final tax is about 2.99 million won, and the donation amount is 710,000 won. The proportion of donors who applied for donation deductions of the total wage and salary earners is 56%, and the proportion of taxpayers applying for donation deductions for five consecutive years is 39%. The number of dependents is the number of basic deductions that appears on the income tax return data, which means the number of dependents connected to the wage and salary earners rather than the size of the household.

〈Table III-8〉 **Basic statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	499,990	44.09	9.88	18	96
Sex	500,000	0.30	0.46	0	1
Citizen or foreigner	500,000	1.00	0.06	0	1
Head of household or not	500,000	0.70	0.46	0	1
Number of dependents	499,924	2.68	1.65	0	11
Foreigner flat tax rate or not	500,000	0.00	0.01	0	1
Total wage (won)	500,000	51,238,542	47,583,713	0	5,005,900,000
Tax base (won)	500,000	25,793,169	41,757,729	0	4,854,832,800
Final tax (won)	500,000	2,986,610	12,885,968	0	1,773,576,464
Total deductible donation	500,000	711,115	2,401,461	0	745,911,603
Donation price	500,000	0.87	0.05	0.62	0.94
Donation or not1	500,000	0.56	0.50	0	1
Donation or not2	500,000	0.39	0.49	0	1

Note: Sex is set to have a value of 0 for men and 1 for women
Citizen or foreigner has a value of 0 for foreigners and 1 for citizens
Head of household or not is a variable having a value 0 for household members and 1 for heads of household.
Foreigner flat tax rate or not has a value 0 for foreigners not applying for flat tax rate and 1 for foreigners applying flat tax rate
Donation price is (1− nominal marginal tax rate)
Donation or not (1) is a variable that is set to have a value of 1 if the total donation deductible amount is greater than 0
Donation or not (2) is a variable that is set to have a value of 1 only if the total donation deductible amount is greater than 0 every year from year 2011 to year 2015

The percentage of donors who applied for donation deduction fell to 52.1% by 7%p points from the previous year when converted to tax credits, and the amount of deductible donations also fell from 1,276,000 won to 1,171,000 won. For each type of donation, legal donations that do not have a deductible limit decreased by more than 20%, but the amount of designated donations that have a deductible limit fell by 7%, much smaller than legal donations.

Looking at the change in the percentage of donors by income range, there was the largest drop in income range of less than 55 million won, falling from 40.3% in 2013 to 28.9% in 2014. The decrease in the percentage of donation

deduction applicants diminished as the level of income increased; for income earners over 100 million won, rather it increased by 0.1%p points.

〈Table III-9〉 **Yearly trend of donation-related variables**

(Unit : won, %)

Year	Average total wage	Proportion of donors	Total donation Deductible donation	Legal donation Deductible donation	Designated donation Deductible donation
2011	45,963,181	55.52	1,248,388		
2012	48,758,261	57.86	1,297,689		
2013	51,328,105	59.27	1,275,809	96,896	1,175,773
2014	53,668,076	52.06	1,171,028	76,621	1,093,597
2015	56,475,086	55.94	1,333,394	85,448	1,245,492

Note: Proportion of donors is calculated as the percentage of the salary and wage earners whose total deductible donation is 0 or more by year
Deductible donation is the average of donors'

〈Table III-10〉 **Trend of percentage of donors by income range**

(Unit: %)

	55 million won or less	70 million won or less	100 million won or less	Over 100 million won
2011	35.55	77.23	85.01	85.69
2012	38.64	79.11	86.03	86.71
2013	40.29	80.24	87.30	87.43
2014	28.93	76.54	86.59	87.53
2015	34.66	79.63	86.78	88.27

Note: Proportion of donors is calculated as the percentage of the salary and wage earners whose total deductible donation is 0 or more by year
Income ranges are divided based on the incomes attributed to year 2015

〈Table III-11〉 **Trend of average deductible donation by income range**

(Unit: won)

	55 million won or less	70 million won or less	100 million won or less	Over 100 million won
2011	684,725	1,065,468	1,499,137	2,495,534
2012	705,108	1,103,059	1,589,016	2,676,737
2013	702,767	1,089,690	1,538,814	2,690,823
2014	607,488	951,307	1,357,560	2,293,190
2015	716,198	1,140,422	1,539,264	2,731,180

Note: Income ranges are divided based on the incomes attributed to year 2015

〈Table III-12〉 **Trend of average deductible legal donation by income range**

(Unit: won)

	55 million won or less	70 million won or less	100 million won or less	Over 100 million won
2013	30,051	57,343	95,343	347,940
2014	27,613	49,028	77,152	214,860
2015	30,204	59,490	80,451	265,421

Note: Income ranges are divided based on the incomes attributed to year 2015

〈Table III-13〉 **Trend of average deductible designated donation by income range**

(Unit: won)

	55 million won or less	70 million won or less	100 million won or less	Over 100 million won
2013	671,302	1,027,597	1,440,084	2,337,930
2014	579,505	902,103	1,280,283	2,074,471
2015	683,792	1,079,735	1,456,985	2,459,654

Note: Income ranges are divided based on the incomes attributed to year 2015

The exogenous system change that enables the price elasticity estimation is the creation of the highest tax rate of 38% range and adjustment of the tax base range along with conversion of tax credit from income deduction for donations (2014). The highest tax rate of 38% was created in 2012, and the conversion of tax credit from income deduction and the lower of the highest tax rate range are exogenously provided to estimate the price elasticity of donations in 2014.

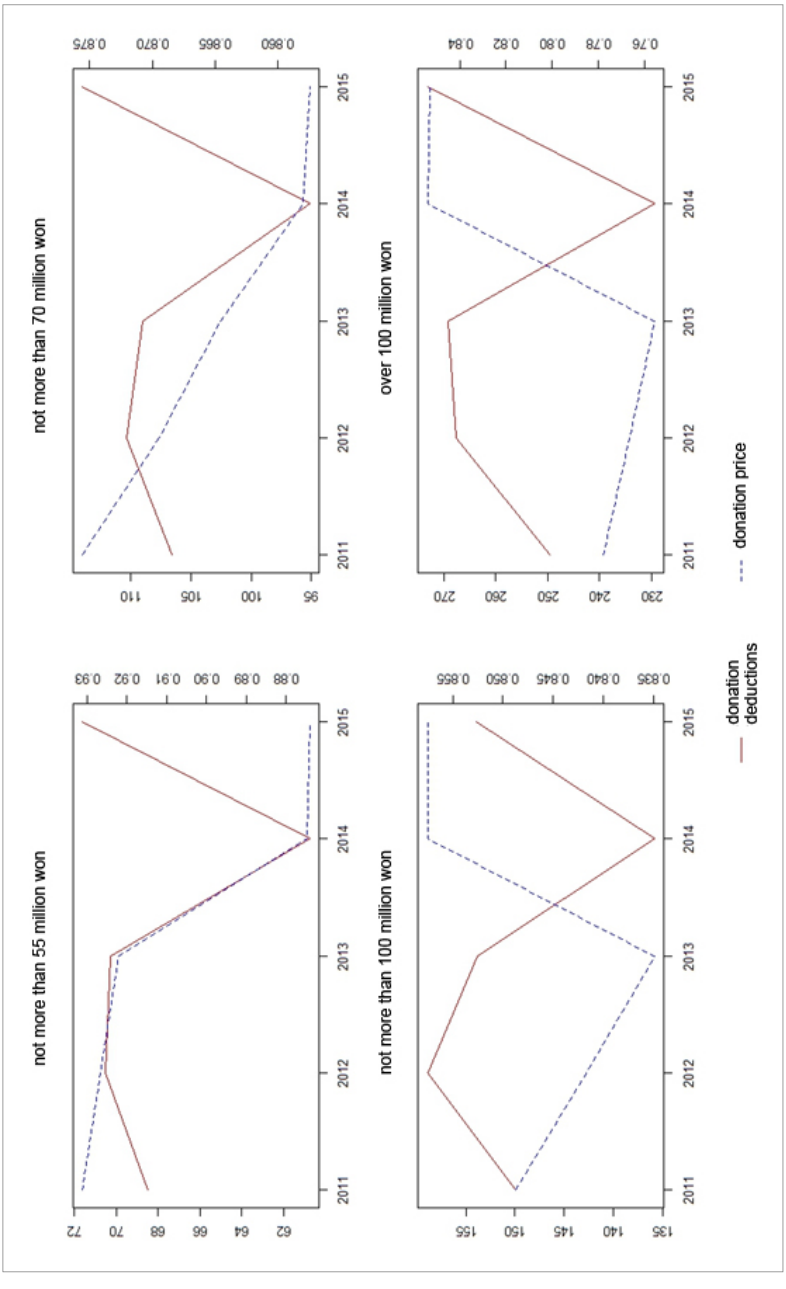
〈Table III-14〉 **Yearly marginal tax rate**

Tax base	2011	Tax base	2012–2013	Tax base	2014–2015
12 million won or less	6%	12 million won or less	6%	12 million won or less	6%
46 million won or less	15%	46 million won or less	15%	46 million won or less	15%
88 million won or less	24%	88 million won or less	24%	88 million won or less	24%
Over 88 million won	35%	300 million won or less	35%	150 million won or less	35%
		Over 300 million won	38%	Over 150 million won	38%

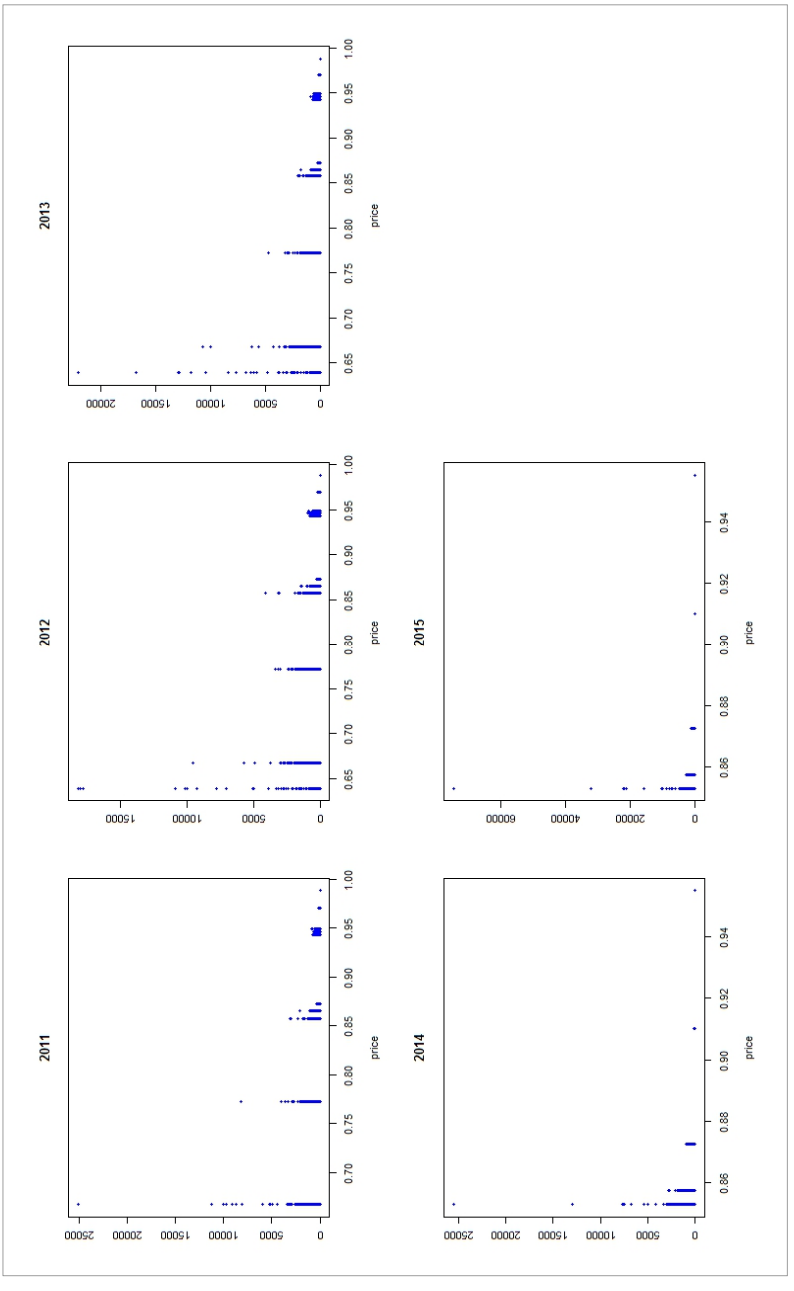
Source: The National Tax Service, Easy Guide for withholding Agents' Year-end Tax Settlement, each year

Looking at the trends of change in donations and donation prices by ranges of total wage level, donations and donation prices show similar trends for income earners less than 70 million won, but opposite trends for income earners over 70 million won. This indicates that although the other factors are not controlled, the relatively middle and lower income group may not be significantly affected by the donation price. However, the correlation between the donation amount and the donation price per year shows a clear negative (-) relationship.

[Figure III-9] **Trend of deductible donation and donation price by income range**



[Figure III-10] Trend of donation price and deductible donation distribution by year



E. Analysis results

The variables used in the regression analysis for the donation analysis were adjusted for that purpose. First, the income variables, such as donation deductions and income after tax, are materialized using the consumer price index (CPI) for proper year-to-year comparison. This is to increase the likelihood of comparability between incomes in other years. The donation price is defined as $(1-\tau_t)$, which is the deduction of the wage and salary income marginal tax rate faced by each income earner; at the time of income deduction, the individual's legal marginal tax rate is applied and the marginal tax rate is applied after the conversion to tax credit. The marginal tax rate was estimated based on the tax base when donation income deduction was not applied to measure the price of the first donation payment of 1 won. In addition, we used the income after tax deducting the wage and salary income tax derived under the assumption that there is no donation paid to control the change in tax base ranges caused by the increase of donation during income deduction days and the change of marginal tax rate through it in the past.

Furthermore, foreigner flat tax rate applicants[22], who are not allowed donation-related deductions, were excluded from the analysis objects.

22) A system that allows to select either current gross income tax or flat tax rate for attracting skilled foreign engineers

〈Table III-15〉 **Explanation of key variables**

Name of variable	Description	Remarks
Donation deductions	Total donation deductions by item by year	Using after being materialized by consumer price index
Income after tax	Income derived by subtracting the final tax if there is no donation deduction from the total wages	Using after being materialized by consumer price index
Donation price	Derived by 1 – marginal tax rate or tax credit rate	The marginal tax rate applicable to the tax base when assuming no donation deduction from 2011 to 2013, and the tax credit rate (15%) is applied collectively after 2014
Age	Age of salary and wage earners	
Sex	Sex of wage and salary earners	Set to 0 for males and 1 for females
Number of dependents	Number of dependents of wage and salary earners	0 for wage and salary earners who do not income deduction and 1 for foreigners applying flat tax rate
Dummy per year	Dummy variable having value of 1 in the relevant year	
Net growth rate	Net growth rate based on GDP	
Consumer price index	Donation deductions, used to materialize the income after tax	

1) Heckman Two-Stage Model

We applied the Heckman two-stage model to explain donation deductions. This is to solve the sample selection that may occur only at the income level, where half of taxpayers apply for donation deductions. The Heckman two-stage model is the method for ensuring the consistency of regression analysis using the observed samples by including the distribution of data that is not actually observed.

In the first step, the Probit model is applied based on whether the donation deduction is applied, and it estimates the portion excluded from the donation deduction distribution. Since the panel data are used, we use the random effect Probit model to estimate the probability of applying for donation deductions,

where the dummy variable of whether donations are paid is a dependent variable. Specifically, the dummy variable of whether donations are paid is set to 1 for wage and salary earners whose donation deductions are greater than zero for all five years from 2011 to 2015, and 0 otherwise. This is to isolate the impact of intermittent donation deduction applicants. It reflects that the price elasticities between continuous donation deduction recipients and intermittent donation deduction recipients are different following the results of Clotfelter (1980).

We use whether a head of household as the condition of exclusion constraint to identify the first and second stage estimates. Whether donations are paid is likely to be decided by the head of household who represents and supports the family and understands the income tax burden. However, specific expenditures can be made collectively by reflecting the will of the spouse or other household member who is responsible for the housekeeping as well as the householder. However, there is a possibility that the amount of deduction for donation by the head of the household may be increased by collecting donations paid by the dependent family without income or the other income earner, but it is difficult to guess the direction uniformly because the number of dependents has a positive (+) correlation with necessary expenses, and thus donations may be decreased. Even though there is a possibility that the amount of donation of the head of household will be relatively high, the economic incentive to collect donations and to deduct them has disappeared due to the conversion of the existing income deduction to the tax credit in 2014.

The independent variables used in the first stage estimation are income after tax, donation price, age, dependents, household income, and year dummy. The income after tax is the income that is subtracted the tax amount when donation deductions are not applied, and materialized by the consumer price index.

The estimation results show that the variable of whether a taxpayer is the head of household used as an exclusion variable in the first stage estimation significantly increases the probability of donation deductions application. The probability of donation deduction application by the head of household is estimated 6.4% points higher than that of the other income earner.

〈Table III-16〉 **Results of random effects probit regression of whether donation is paid**

VARIABLES	Dependent variable: donation or not
ln(income after tax)	4.270***
	(0.0306)
ln(donation price)	0.428**
	(0.193)
Age	−0.0130***
	(0.000858)
Sex	0.394***
	(0.0188)
Number of dependents	−0.0497***
	(0.00499)
Head of household or not	0.0642***
	(0.0167)
Net growth rate	64.68***
	(1.951)
2012	0.782***
	(0.0248)
2013	0.258***
	(0.0186)
2014	−0.254***
	(0.0185)
2015	−
Constant	−57.38***
	(0.394)
lnsig2u	2.832***
	(0.0164)
Observations	499,913
Number of id2	99,989

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

We calculated the inverse Mills ratio (lambda) using the fitted value of the random effect Probit as a two-stage estimation, and included in the regression model for donation deductions to estimate it. As a result, the price elasticity of donation is -0.151, which is very low, and the income elasticity is 0.864, which is like that of Ki Baek Park (2010). In the estimation by income level, which shows different change in donations, the income elasticity was highest at 1.063 for total wage earners of 70 million won ~ 100 million won and 0.996 for total wage earners of less than 55 million won. On the other hand, the price elasticity was -0.449 for total wage earners between 55 ~ 70 million won, and not significant for the income earners of between 70 million won ~ 100 million won. For those who earned less than 55 million won and those who earned more than 100 million won, the price elasticities were positive (+), which are not consistent with the economic intuition. In general, we understand that the income has a great influence on donation decisions.

〈Table III-17〉 **Fixed-effects (within) regression**

	ln (total deductible donation)				
	Overall	Total wage 55 million won or less	Total wage 70 million won or less	Total wage 100 million won or less	Total wage Over 100 million won
ln (income after tax)	0.864***	0.996***	0.926***	1.063***	0.893***
	(0.0428)	(0.198)	(0.186)	(0.110)	(0.0576)
ln (donation price)	−0.151***	0.362***	−0.449**	0.0312	0.293***
	(0.0498)	(0.139)	(0.187)	(0.134)	(0.110)
Age	0.00565**	0.0271***	−0.00426	−0.0107**	−0.00888
	(0.00235)	(0.00896)	(0.00832)	(0.00521)	(0.00555)
Number of dependents	0.0351***	0.00157	0.0166**	0.0522***	0.0446***
	(0.00379)	(0.00885)	(0.00749)	(0.00685)	(0.00871)
lambda	−0.162***	−0.136**	−0.186***	−0.0608	−0.00426
	(0.0167)	(0.0566)	(0.0686)	(0.0564)	(0.0668)
2012	0.0691***	0.0767***	0.0404***	0.0828***	0.102***
	(0.00556)	(0.0110)	(0.0111)	(0.0102)	(0.0138)
2013	0.112***	0.0881***	0.0751***	0.130***	0.217***
	(0.00552)	(0.0112)	(0.0112)	(0.0105)	(0.0155)
2014	−0.0547***	−0.0854***	−0.0689***	−0.0390***	−0.0307**
	(0.00550)	(0.0109)	(0.0109)	(0.00996)	(0.0132)
2015	–	–	–	–	–
Constant	−3.263***	−5.580**	−3.634*	−5.307***	−2.957***
	(0.499)	(2.284)	(2.156)	(1.281)	(0.688)
Observations	196,400	46,595	50,185	63,410	36,210
R-squared	0.028	0.054	0.025	0.019	0.024
Number of id2	39,280	9,319	10,037	12,682	7,242

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

These results are maintained even when estimating the random effects model. Considering that donations are altruistic, we understand that they are mainly determined by income level and are very insensitive to price changes. In addition, they may be caused by the uncertainty of administration related to donations.

Because the relationship between donations and prices may weaken for the uncertainty of the receipt of donation.

〈Table III-18〉 **Random-effects GLS regression**

	ln (total deductible donation)				
	Overall	Total wage 55 million won or less	Total wage 70 million won or less	Total wage 100 million won or less	Total wage Over 100 million won
ln (income after tax)	0.911***	1.041***	1.122***	1.423***	0.992***
	(0.0315)	(0.185)	(0.177)	(0.103)	(0.0464)
ln (donation price)	−0.104**	0.399***	−0.346*	0.309**	0.406***
	(0.0492)	(0.137)	(0.184)	(0.132)	(0.109)
Age	0.0308***	0.0372***	0.0295***	0.0248***	0.0468***
	(0.000898)	(0.00167)	(0.00189)	(0.00169)	(0.00253)
Sex	0.288***	0.261***	0.242***	0.241***	0.347***
	(0.0185)	(0.0342)	(0.0358)	(0.0373)	(0.0656)
Number of dependents	0.0232***	−0.00318	0.0118*	0.0354***	0.0361***
	(0.00306)	(0.00765)	(0.00622)	(0.00550)	(0.00694)
lambda	−0.104***	−0.114**	−0.173***	0.0253	0.0290
	(0.0133)	(0.0529)	(0.0656)	(0.0540)	(0.0626)
t	−0.0272***	−0.0118	−0.0426***	−0.0508***	−0.0632***
	(0.00208)	(0.00798)	(0.00761)	(0.00497)	(0.00572)
2012	0.0710***	0.0784***	0.0440***	0.0905***	0.108***
	(0.00554)	(0.0109)	(0.0110)	(0.0102)	(0.0137)
2013	0.118***	0.0972***	0.0895***	0.143***	0.227***
	(0.00543)	(0.0103)	(0.0105)	(0.0103)	(0.0154)
2014	−0.0527***	−0.0818***	−0.0651***	−0.0400***	−0.0331**
	(0.00549)	(0.0108)	(0.0109)	(0.00999)	(0.0132)
2015	–	–	–	–	–
Constant	−4.980***	−6.663***	−7.575***	−11.55***	−6.781***
	(0.412)	(2.406)	(2.316)	(1.352)	(0.618)
Observations	196,400	46,595	50,185	63,410	36,210
Number of id2	39,280	9,319	10,037	12,682	7,242

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

2) Random effects tobit regression

The Tobit model can be used to analyze donation deductions. The model is useful for analyzing censored data because donation deductions are also censored data with a lower limit of zero. In previous research, it was used in Ki Baek Park (2010) and Heon Jae Song (2013).

According to the assumption that the taxpayer's expectation for tax burden is based on past experiences (adaptive expectation) in the estimation model, we let the relevant year's final tax return experience (the previous year's income and donation price) determine donations in this year. We assumed that taxpayers understood the relationship between donations and income deductions, that is, donation prices, through the final tax return experience. This is because actual wage and salary earners have many difficulties in knowing their total wages in the relevant year, and there are also many other deduction systems, which makes them difficult to understand marginal tax rates applied to actual donations[23]. However, the final tax return experience of the relevant year may have a significant impact on donations because the final tax return for wage and salary income at the end of February in the relevant year makes taxpayers understand the deduction effects of donations, etc.[24]

Because of estimating by income level, the phenomenon of which the income elasticity of the high-income earner is lowered is mitigated. The price elasticity shows decreasing trends by income range; 1.62 (under 55 million won), 0.28 (between 55 million won ~ 70 million won), 0.97 (70 million won ~ 100 million won) and 0.40 (over 100 million won), but the elasticity of the income earners whose income range is 55 million won ~ 70 million won appears very low. For price elasticity, it is significant in the lower income class and insignificant

23) Of course, after the income deduction for donation is converted to the tax credit, it is an invalid argument because the tax credit is granted regardless of one's income level. However, reflecting the fact that this is just after the system change, there is also possibility left for decision based on experience.

24) When the estimation model is expanded to include current and future income and price variables, we can see that income elasticity becomes higher. That is, the adaptation of income change appears as a change of donation with time lag, and the effect is 0.27 elasticity level (see Appendix). On the other hand, donation price elasticity showed a positive (+) value for the relevant year's price change. This is inconsistent with economic theory; if the perception of changes in the donation price is not felt until the actual income reporting time, it is feasible phenomenon.

in the higher income class. Specifically, the price elasticities of income earners less than 55 million won and 55 million ~ 70 million won are remarkably elastic, -2.47 and -2.40, respectively, and the elasticity of higher income earners is very lower or statistically insignificant. The results show that the influence of donation price becomes smaller as going up to higher income class, that altruistic incentives remarkably effect on donation decisions, and that the income effect may be larger than the price effect in the middle- and lower-income class. The results show that the role of tax incentives for income earners of less than 70 million won may be important to vitalize donations in the future.

The estimation result of designated donations shows higher income elasticity and price elasticity than the overall donations model. We can understand that designated donations show more elastic changes than legal donations do.

〈Table III-19〉 **Results of random tobit regression of total deductible donation**

	ln (deductible donation)				
	Overall	Total wage 55 million won or less	Total wage 70 million won or less	Total wage 100 million won or less	Total wage Over 100 million won
L.ln (income after tax)	5.160***	5.343***	0.397***	1.133***	0.454***
	(0.0303)	(0.0660)	(0.0797)	(0.0790)	(0.0774)
L.ln (donation price)	−1.327***	−8.118***	−3.385***	−0.392	0.0921
	(0.142)	(0.425)	(0.402)	(0.266)	(0.238)
Age	−0.0411***	−0.109***	0.0373***	0.0265***	0.0166***
	(0.00183)	(0.00330)	(0.00418)	(0.00345)	(0.00523)
Sex	0.505***	0.953***	1.435***	0.523***	−0.0672
	(0.0413)	(0.0724)	(0.0799)	(0.0771)	(0.138)
Number of dependents	0.160***	−0.0753***	0.158***	0.146***	0.223***
	(0.00884)	(0.0201)	(0.0150)	(0.0121)	(0.0165)
Net growth rate	−250.3***	−534.7***	−20.46*	−29.55***	29.57**
	(5.900)	(15.35)	(10.75)	(8.839)	(15.06)
2013	1.568***	3.361***	0.203***	0.295***	−0.00186
	(0.0305)	(0.0827)	(0.0555)	(0.0467)	(0.0855)
2014	1.364***	2.974***	−0.260***	0.156**	−0.305**
	(0.0519)	(0.139)	(0.0936)	(0.0788)	(0.143)
Constant	−56.44***	−52.08***	−1.711*	−9.206***	−0.996
	(0.381)	(0.876)	(0.972)	(0.957)	(0.923)
sigma_u	4.858***	6.728***	3.956***	3.276***	3.339***
	(0.0163)	(0.0364)	(0.0271)	(0.0210)	(0.0284)
sigma_e	3.117***	4.404***	2.392***	1.979***	1.947***
	(0.00567)	(0.0137)	(0.00883)	(0.00676)	(0.00886)
Observations	399,924	228,817	65,092	68,167	37,844
Number of id2	99,985	57,205	16,273	17,042	9,463

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

〈Table III-20〉 **Results of random tobit regression of deductible designated donations**

	ln(deductible designated donation)				
	Overall	Total wage 55 million won or less	Total wage 70 million won or less	Total wage 100 million won or less	Total wage Over 100 million won
L.ln(income after tax)	6.177***	6.486***	−0.0819	1.203***	0.514***
	(0.0411)	(0.0937)	(0.126)	(0.128)	(0.121)
L.ln(donation price)	−1.623***	−12.75***	−6.612***	−0.566	0.653*
	(0.193)	(0.615)	(0.659)	(0.394)	(0.364)
Age	−0.0369***	−0.108***	0.0430***	0.0310***	0.0418***
	(0.00236)	(0.00428)	(0.00558)	(0.00478)	(0.00729)
Sex	1.283***	2.140***	1.711***	0.694***	0.325*
	(0.0531)	(0.0929)	(0.107)	(0.107)	(0.190)
Number of dependents	0.207***	−0.139***	0.154***	0.227***	0.417***
	(0.0125)	(0.0282)	(0.0221)	(0.0185)	(0.0257)
Net growth rate	234.3***	705.8***	−25.18**	−26.13**	−102.0***
	(6.882)	(18.86)	(12.69)	(11.11)	(21.46)
2014	−2.140***	−5.720***	−0.375***	−0.0101	0.507***
	(0.0416)	(0.104)	(0.0754)	(0.0627)	(0.103)
Constant	−84.24***	−102.1***	2.758	−11.69***	−1.234
	(0.596)	(1.349)	(1.756)	(1.834)	(1.964)
sigma_u	5.953***	8.009***	5.178***	4.456***	4.486***
	(0.0218)	(0.0499)	(0.0392)	(0.0310)	(0.0414)
sigma_e	3.564***	4.989***	2.825***	2.393***	2.462***
	(0.00855)	(0.0213)	(0.0137)	(0.0106)	(0.0146)
Observations	299,946	171,613	48,819	51,126	28,386
Number of id2	99,985	57,205	16,273	17,042	9,463

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Ⅳ

Conclusion and Policy Implications

This study examined the effect of donation deduction system on donation activities of households and individuals in Korea through using two kinds of micro-data. The first one is the analysis using the National Survey of Tax and Benefit (NaSTaB) data that the Korea Institute of Public Finance has surveyed annually since 2008. Using the NaSTaB data, we analyzed the effect of the conversion of the donation deduction system on donation behaviors of individuals or households through the difference-in-difference method. Here, the analysis through the NaSTaB data is divided into two types according to the sources of available information and the information collection unit. First, it is the analysis of the individual unit using the information of receipt for wage and salary income tax withholding. Second, it is the analysis of the household unit using information in the NaSTaB.

According to the results of the individual analysis using the information on receipts for wage and salary income tax withholding obtained from the NaSTaB, the average treatment effect of the system changes on the high-income class was not statistically significant even under the 10% significance level. This implies that the conversion of the donation deduction system for the high-income class has no causal effect that leads to a decrease in the donation rate. The effect of the average treatment of system changes for the low-income class was statistically significant only in some models below the 10% significance level. This shows that the conversion of the donation deduction system for the low-income class may have a causal effect that leads to an increase in the donation rate.

According to the analysis of the household unit using the NaSTaB data, the effect of the average treatment of system changes regardless of the income level was analyzed statistically as not significant even under the 10% significance level. Therefore, the analysis of household unit implies that the conversion of the donation deduction system has no causal effect on decreases of the donation rate not only in the high-income class but also in the low-income class.

The second one is the analysis that estimates the income and price elasticity of the donation deduction applied based on the tax return data of wage and salary earners held by the National Tax Service. Because of the estimation reflecting the data's attributes of donation deduction applied, that is, attributes of censored data, income elasticity is higher than price elasticity overall. The income elasticity was 1.19 ~ 2.45 according to the estimation method, and the size was decreased as income increased. The price elasticity was -0.12 ~ -0.63, which is quite small. In addition, according to the income level, while the price elasticity was relatively large (-2.40 to -2.47) in the middle and lower range, the statistical significance was low in the high-income range. In general, similar results also appeared in the results of the analysis on designated donations including religious organization, etc., but the analysis showed that the elasticity of middle and lower income earners was higher.

The results of the above analysis indicate that there is generally no causal effect that the conversion of donation deduction system is dampening the donations of individuals or households. The results imply that the overall impact of tax supports for donations is not significant. In addition, the economic situation such as income level and psychological motive are the main determinants as shown in the analysis through the income tax returns held by the National Tax Service. In particular, the fact is well shown in the results of responses to factors causing an increase or decrease in donations among the cross-sectional survey that examined the individual's donation willingness. According to the survey, the rate of responding that motives are important among those who increased their donations over the past three years is 74.9%. In addition, the rate of responding that the deterioration of the economic situation is important as a factor of the decrease of donations among those who decreased their donations over the past three years is 77.5%.

On the other hand, looking through the individual unit analysis using the NaSTaB, the conversion of the donation deduction system seems to have raised the donation rate of the low-income class. And the analysis through the income tax returns held by the National Tax Service shows that the influence of tax supports may be significant for income earners of less than 70 million won.

Putting together the analyses, it is considered that the change in the taxation system that decreases the donation price of low-income earners and increases the donation price of high-income earners, that is, from income deduction to tax credit, did not negatively affect the donation of wage and salary earners. Considering that in the middle- and lower-income class, the price elasticity of designated donations is higher than that of total donations, if the tax policy focuses on designated donations, we can expect the effect of more increase in contributions.

In Chapter II, we examined the provisions of donation-related tax law for households and individuals in Korea. As a result, it seems that the conversion of donation deduction system from income deduction system to tax credit system induced to change the tax burden only to those who do not have business income, such as those with only wage and salary income. That is, there was a difference in the donation price between the self-employed and wage and salary earners, who had earned the same income. There may be a controversy as to whether the discrimination of the tax benefits is reasonable in terms of tax equity. In the future, it will be necessary to prepare a policy alternative to raise the equity of tax benefits by making donation prices of both wage and salary earners and the self-employed similar by their income level.

In addition, it is revealed that the provisions of donation-related tax law for households and individuals are confusingly prescribed in the Income Tax Act and the Restriction of Special Taxation Act. Therefore, it is necessary to arrange more clearly and accurately the relevant regulations to enrich the taxpayer 's understanding of donation-related regulations and to enhance the transparency of law enforcement. In particular, the problem that causes confusion in the legal interpretation as follows due to definitions of terms that are not used in accordance should be solved.

The examples of different definitions of terms used between tax laws are as follows. “The amount of Income” in Article 34 (1) 1 of the Income Tax

Act defined as "income before adding donations and designated donations in necessary expenses" and the definition is "hereafter the same shall apply in this Article." However, in Article 81 (4) 1 of the Enforcement Decree of Article 34 of the same Act, "the income amount" is defined as "income before adding donations in necessary expenses" and the definition is "hereafter the same shall apply in this Article." Interpreting the provisions, there is room for misunderstanding that the permissible limit of necessary expenses is calculated under the Income Tax Act, considering the amount subtracting legal and designated donations as income. On the other hand, in the Enforcement Decree of the Income Tax Act, the permissible limit of necessary expenses is calculated, considering the amount subtracting other donations, such as political fund donations and employee stock ownership association donations, etc., as income. Like this, there are provisions that may bring about different interpretations between the Income Tax Act and its Enforcement Decree, and it causes taxpayers a great deal of confusion in the interpretation of the law. Therefore, the consistency of the definitions of terms between the provisions of the Income Tax Act and the Enforcement Decree of the Act is needed to eliminate the confusion and different interpretations.

The method of creating statistics in the Statistical Yearbook of National Tax published by the National Tax Service is required to be modified in accordance with the change of donation deduction system. For example, looking at the Filing of Donation table of global income taxes in the 2015 Statistical Yearbook of National Tax, the total amount is the sum of donations subject to special income deduction, donations included in necessary expenses, and tax credits subject to tax credit for donation. While the first two amounts are donation amounts, the last one is the tax credit that is the donation amount multiplied by the tax credit rate; it is impossible to sum them. Therefore, it is necessary to provide donation amount information on the income tax return by providing information on donations subject to donation special tax credits. In addition, counting the number of taxpayers on the Filing of Donation table of global income taxes is expected to be duplicated. The reason is that the same taxpayer can apply for inclusion in necessary expenses for the newly donated amount, apply for a tax credit for the donation that is not included in necessary expenses, and apply for a special donation deduction for donations that have not been deducted in the

past. Therefore, we think that it is necessary to provide not only the simple sum of the number of taxpayers who applied for donation deductions but also information of the net sum of the number. As mentioned above, the method of creating statistics of the Statistical Yearbook in National Tax should be improved so that the donation related overall status can be grasped.

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Appendix

Additional Analysis of The Difference-in-Difference Model Using the National Survey of Tax and Benefit

A. Additional Analysis of Individuals Who Submitted Receipts For Wage And Salary Income Tax Withholding

1) Analysis Results as Repeated Cross-Sectional Survey Data

〈Appendix Table 1〉 **Results of estimating the impact of conversion of donation deduction system on individual donation activity: Repeated cross-sectional data analysis**

Explanatory variable	Model 1	Model 2	Model 3	Model 4
Low–income treatment indicator variable	0.0050***	0.0036	0.0001	0.0004
	(0.0017)	(0.0024)	(0.0044)	(0.0044)
High–income treatment indicator variable	0.0040	–0.0005	–0.0009	–0.0005
	(0.0033)	(0.0045)	(0.0084)	(0.0084)
The 8th year dummy variable	–0.00409***	–0.0015	0.0001	–0.0004
	(0.0013)	(0.0018)	(0.0034)	(0.0034)
Low–income treatment dummy variable	–0.00589***	–0.00401**	0.0019	0.00654*
	(0.0012)	(0.0019)	(0.0031)	(0.0036)
High–income treatment dummy variable	0.00362	0.000406	0.00267	–0.0059
	(0.0027)	(0.0036)	(0.0059)	(0.0068)
Income		7.90e–11***		1.42e–10**
		(0.0000)		(0.0000)
Constant term	0.0157***	0.00973***	0.0129***	0.00521
	(0.0010)	(0.0020)	(0.0024)	(0.0038)
Number of samples	3,518	1,874	1,874	1,874

Note: 1. (High) Low–income treatment dummy variable = dummy variable of the 8th year (High) Low–income treatment dummy variable
2. ( ) represents the standard error, and ***, **, * mean statistical significance below 1%, 5% and 10% significance level respectively.
3. The Income means incomes calculated by subtracting temporary income such as the amount of prizes, congratulations and condolences, lump sum payments of various pensions, etc., from individual gross income.

2) Analysis Results as Balance Panel Analysis Data[25)]

〈Appendix Table 2〉 **Results of estimating the impact of conversion of donation deduction system on individual donation activity: Balanced panel data analysis where income position is variable**

Explanatory variable	Model 1	Model 2	Model 3	Model 4
Low-income treatment indicator variable(D_{it}^1)	0.00404***	0.00329*	0.0001	-0.0001
	(0.0016)	(0.0020)	(0.0026)	(0.0026)
High-income treatment indicator variable(D_{it}^2)	-0.00179	-0.000884	-0.000946	-0.00117
	(0.0023)	(0.0037)	(0.0049)	(0.0049)
The 8th year dummy(T_t)	-0.00216**	-0.00103	0.000137	0.000392
	(0.0010)	(0.0015)	(0.0019)	(0.0020)
Income		0.0000		0.0000
		(0.0000)		(0.0000)
Constant term	0.0125***	0.0124***	0.0141***	0.0169***
	(0.0005)	(0.0022)	(0.0009)	(0.0029)
Number of samples	1,372	937	937	937

Note: 1. ( ) represents the standard error, and ***, **, * mean statistical significance below 1%, 5% and 10% significance level respectively.
2. The Income means incomes calculated by subtracting temporary income such as the amount of prizes, congratulations and condolences, lump sum payments of various pensions, etc., from individual gross income.

25) The case that the income position is variable between two time points is also included in the analysis.

B. Additional analysis of the National Survey of Tax and Benefit Household

1) Donation Rates Compared to Household's Wage And Salary Income

〈Appendix Table 3〉 **Results of estimating the impact of conversion of donation deduction system on household donation activity by sector**

	Total donations	Political parties donation	Educational institution donation	Social welfare institution donation	Cultural arts donation	Religious organization donation[1)]
Low-income treatment indicator variable(D_{it}^1)	0.0006	-0.0001	0.0000	0.0013	-0.0002	-0.0002
	(0.0024)	(0.0001)	(0.0000)	(0.0010)	(0.0001)	(0.0024)
High-income treatment indicator variable(D_{it}^2)	-0.0021	-0.0001	7.94e-05**	0.0015	-0.0002	0.0009
	(0.0038)	(0.0001)	(0.0000)	(0.0016)	(0.0002)	(0.0037)
The 8th year dummy(T_t)	-0.0021	0.0001**	0.0000	-0.00134*	0.0002**	-0.0026
	(0.0018)	(0.0001)	(0.0000)	(0.0007)	(0.0001)	(0.0017)
Gross income	-1.73E-07	1.28E-08	3.85E-09	1.33E-08	6.79E-09	-3.03E-08
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Net asset	-2.68e-07***	-6.44E-10	-1.16E-10	-8.00E-09	-3.13E-10	-2.59e-07***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
The number of household members	0.0011	-0.0001	0.0000	0.0016	0.0000	-0.00418*
	(0.0025)	(0.0001)	(0.0000)	(0.0010)	(0.0001)	(0.0024)
Constant term	0.0169**	0.0002	0.0000	-0.0025	0.0001	0.0258***
	(0.0074)	(0.0003)	(0.0001)	(0.0031)	(0.0003)	(0.0072)
Number of samples	1021	1021	1021	1021	1021	1021

Note: 1. The dependent variable is the ratio of the sum of donations compared to household's wage and salary income
2. Religious organization donation includes church offering and temple offering.
3. ( ) represents the standard error, and ***, **, * mean statistical significance below 1%, 5% and 10% significance level respectively.

2) Donation Analysis by Sector Compared To Household's Wage And Salary Income

〈Appendix Table 4〉 **Results of estimating the impact of conversion of donation deduction system on household donation activity by sector**

	Total donations	Political parties donation	Educational institution donation	Social welfare institution donation	Cultural arts donation	Religious organization donation[1)]
Low-income treatment indicator variable(D_{it}^1)	0.0014	-0.0001	0.0000	0.0012	-0.0002	0.0011
	(0.0023)	(0.0001)	(0.0000)	(0.0009)	(0.0001)	(0.0021)
High-income treatment indicator variable(D_{it}^2)	-0.0018	-0.0001	7.86e-05**	0.0017	-0.0002	0.0008
	(0.0035)	(0.0001)	(0.0000)	(0.0015)	(0.0002)	(0.0033)
The 8th year dummy(T_t)	-0.0019	0.0001**	0.0000	-0.00133*	0.0002**	-0.0024
	(0.0016)	(0.0001)	(0.0000)	(0.0007)	(0.0001)	(0.0015)
Gross income	-5.20e-07	0.0000	0.0000	0.0000	0.0000	0.0000
	(4.75e-07)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Net asset	-2.38e-07***	-6.09E-10	-1.15E-10	-5.74E-09	-3.13E-10	-1.73e-07***
	(6.97e-08)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
The number of household members	0.00076	-0.0001	0.0000	0.0016	0.0000	-0.00455**
	(0.0023)	(0.0001)	(0.0000)	(0.0010)	(0.0001)	(0.0022)
Constant term	0.0172**	0.0002	0.0000	-0.0022	0.0001	0.0258***
	(0.0069)	(0.0002)	(0.0001)	(0.0029)	(0.0003)	(0.0065)
Number of samples	1,021	1,021	1,021	1,021	1,021	1,021

Note: 1. The dependent variable is the ratio of the sum of donations compared to household's gross income.
2. Religious organization donation includes church offering and temple offering.
3. ( ) represents the standard error, and ***, **, * mean statistical significance below 1%, 5% and 10% significance level respectively.