Research Journal of Business Management

ISSN 1819-1932

Academic Journals Inc.

www.academicjournals.com

OPEN ACCESS Research Journal of Business Management

ISSN 1819-1932
DOI: 10.3923/rjbm.2016.15.25

Research Article
Effect of Sunset of Investment Loss Offset on Net Cash Flow to Fund: Evidence from Korean Market

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Abstract
This study aims to analyze empirically whether fund investors make their fund investment decision by considering the change in fund taxation, which is the sunset of offset of the qualifying investment losses. This study analyzes the change in investment cash flow to overseas investment funds upon the enactment of the sunset clause under the Korean tax law in 2014, which discontinued the offset of certain losses incurred in the fund for tax purposes. In order to do that, this study examines any change in cash flow to overseas investment funds at the time of the announcement of sunset of the offset of the qualified investment loss (i.e., 6 August, 2014) and the actual sunset of the offset (i.e., 31 December, 2014) by leveraging the multivariate analysis utilized in prior studies. This study finds that cash flows to the overseas investment funds subject to the sunset provision were significantly decreased for the period following the announcement of the sunset to the actual sunset. The same results were obtained even in case where foreign exchange factors are considered and the samples are narrowed down to funds established before 1 June, 2007. Such finding suggests fund investors attempted to reduce their tax burden by redeeming their funds after the announcement date upon gaining awareness of the limited period to offset a qualified loss in relation to the offshore-listed shares. This is in line with discussions in the prior studies, which demonstrate that change in taxation of certain investments may affect the investor's investment decision. Given that only a few empirical studies have focused on the tax factors on investment in fund when certain taxation rules have expired, the present study contributes to the literature by identifying the effects of fund taxation on fund investment when a specific favorable tax has sunset.

Key words: Fund taxation, cash flow to fund, temporary tax exemption, effect of sunset provision

Received: May 08, 2016 **Accepted:** May 30, 2016 **Published:** June 15, 2016

Citation: HyeongTae Cho and WonSeok Choi, 2016. Effect of sunset of investment loss offset on net cash flow to fund: Evidence from Korean market. Res. J. Business Manage., 10: 15-25.

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Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

In January, 2007, the Korean government announced the temporary tax exemption rule for disposal income or evaluation gain of offshore-listed shares incurred in an overseas investment onshore fund from 1 June, 2007 to 31 December, 2009. This rule was implemented with the aim of facilitating overseas investment and stabilizing foreign exchange rates. This tax benefit also aimed to resolve unfair tax treatment, that is income derived from the disposal or evaluation of domestic shares through a fund are tax exempt, whereas income tax is withheld at 15.4% for incomes derived from the transfer or evaluation of offshore shares through an investment fund.

When prices for offshore shares plummeted in the wake of the 2008 financial crisis, a number of overseas fund investors suffered from overall losses in their fund investments in the funds, whereas they realized foreign exchange gain because of an appreciation of foreign currency. However, the temporary tax exemption rule does not exempt foreign exchange gain, despite the fact that it does not assess tax on incomes derived from the disposal or evaluation of the listed shares in the offshore market nor allow tax deduction on losses incurred from the disposal or evaluation of offshore shares. As a result of the temporary tax exemption rule, overseas fund investors had to bear income tax because they realized foreign exchange gain even though the investment incurred a loss. To mitigate this tax issue, the Korean tax authorities implemented a tax ruling which states that a foreign exchange transaction gain is determined by multiplying the declined share price by any increase in a foreign exchange rate to minimize taxable income. However, investors continued to display an intense resistance against the overall tax system.

To resolve the issue (i.e., the tax payable on income from fund investments is not calculated in proportion to an economic income), the Korean government implemented a transitional provision. This was temporarily applied from 1 January to 31 December, 2010, immediately after the end of the temporary tax exemption rule on the qualified investment income from the overseas investment funds made by 31 December, 2009. This transitional provision allowed a taxable income of fund investment, including foreign exchange gain to be offset by losses from the sales of foreign-listed stocks or valuation which occurred from 1 June, 2007 to 31 December, 2009. However, as its effect to reduce tax burden on fund investors was insignificant because of the mediocre recovery of the global stock markets in 2010, the transitional provision was continuously renewed until the announcement on 6 August, 2014 that it would completely sunset by 31 December, 2014.

The sunset of the transitional provision to offset loss derived from the evaluation or disposal of offshore shares against other income in investments into the overseas investment fund was a significant event for fund investors. The offset would be unavailable after 31 December, 2014, hence, fund investors were only able to reduce their tax burden by realizing losses through fund unit redemptions before the effectivity date of the sunset. On and after January 1, 2015, all incomes from overseas investment funds became subject to a withholding tax of 15.4% without any deduction of the losses in relation to offshore-listed shares. Therefore, the period before 31 December, 2014 was deemed the most appropriate timing for unit redemptions of any fund if the overseas investment fund generated profits. Actually, numerous media reports covered the sunset of the transitional provision and recommended redemption of the overseas investment funds before 31 December, 2014.

Choi *et al*. (2008) attempted to determine how the tax exemption rule changes to Article 91-2 of the Restriction of Special Taxation Act (i.e., the tax exemption rule effective in 1 June, 2007) influence capital investment decisions in the Korean financial investment market. That study created general models of capital investment decisions by citing literature reviews and examined a sample of funds from 2006-2007 in the Asset Management Association of Korea's database. The study considered the effects of 4 factors (i.e., expected rate of return, risk, tax change and fund size) on capital investment decisions. By analyzing changes in the balance of assets under management of the funds for the tested period, Choi *et al*. (2008) concluded that the factor of tax change has significant effects on the capital investment decisions. The balance of Assets Under Management (AUM) of the funds increased significantly after the amendment to the Restriction of Special Taxation Act compared with that of the prior period. By demonstrating the increase in AUM, Choi *et al*. (2008) argued that to increase after-tax rate of return, fund investors considered the timing at which they should make their fund investment decisions.

By reviewing the movement of both overseas fund sales and cash flow to the funds, Yoon (2014) analyzed whether fund investment increased during the implementation of the temporary tax exemption system for overseas investment funds and the sunset of the tax exemption rule under the Article 91-2 of the Restriction of Special Taxation Act. Yoon (2014) noted that both overseas fund sales and cash flow to the fund significantly increased at the time of the temporary tax exemption for overseas investment fund

compared with those of the period before the implementation of the tax rule change. In addition, overseas fund sales and cash flow to the funds significantly decreased after the sunset of the tax exemption rule.

Certain studies criticized the temporary tax exemption rule for overseas investment funds and suggested solutions to the issues. Son and Lee (2009), revealed that income tax might be assessed even in cases, where overall fund investment suffers loss because of the temporary tax exemption rule. The rule does not allow deduction of loss from the transaction or evaluation of offshore listed shares for tax purposes, which may lead to the unfair tax treatment of not utilizing evaluation loss of offshore-listed shares even at the time of fund redemption.

Moon and Lee (2011) examined taxation problems on foreign exchange gain in overseas investment funds derived from the enactment of the Article 91-2 of the Restriction of Special Taxation Act. They analyzed tax burdens from the investor's perspective by setting up multiple scenarios consisting of changes in foreign stock prices and foreign exchange rates. Based on their review of the foreign-investment-fund tax system and the proposed scenarios, they found that tax burdens of investors vary depending on the scenarios of stock price and foreign exchange even if economic incomes under the scenarios are the same. Moon and Lee (2011) also reported that the tax ruling implemented by the Korean government to reduce tax burden derived from foreign exchange fluctuations may cause unfair tax treatment depending on changes of the investment environment. By applying the same calculation method of taxable income for both domestic and foreign investment funds, they suggested that fund taxation should be improved toward equal tax treatment.

Yoon and Kim (2015) investigated whether the temporary tax exemption rule for overseas investment funds under Article 91-2 of the Restriction of Special Taxation Act has any effect on the tax burden of investors in Korea. The study revealed a statistically higher positive significance of the tax benefit during the application of tax exemption compared with that of taxation. This finding indicates that a temporary tax exemption policy on the overseas investment funds enabled investors to enjoy the tax benefit. However, the study also noted a statistically significant negative relationship between the fluctuating foreign exchange rate and the tax benefit. This relationship indicates that the tax basis of an overseas investment fund increases with any appreciation in non-Korean Won currency, thereby resulting in more taxable income at the time of redemption of a fund or settlement of accounts in a fund.

With respect to determinants of cash flow to a fund, Gruber (1996) demonstrated that the average realized annual cash flow, which is normalized by dividing by total net assets from the end of the previous year for deciles, have a significant positive relationship. Barclay *et al.* (1998) suggested that the individual income tax burden faced by fund investors when they hold a fund is negatively correlated with fund inflows. Yoo and Hwang (2010) examined the disposition effect on the Korean mutual fund market. They analyzed empirical relationships between the risk-adjusted excess return of a fund and cash flows to a fund and noted that the high risk-adjusted excess return leads to high redemption rates. Based on their finding, they suggest the possibility of the disposition effect on individual fund investors.

Prior studies empirically proved that various changes in fund taxation affect investment decisions made by fund investors. In cases of favorable tax treatment of income derived from fund investment, cash inflows to those funds from fund investors increase, whereas the cash inflows decrease when the favorable tax treatment is no longer applicable.

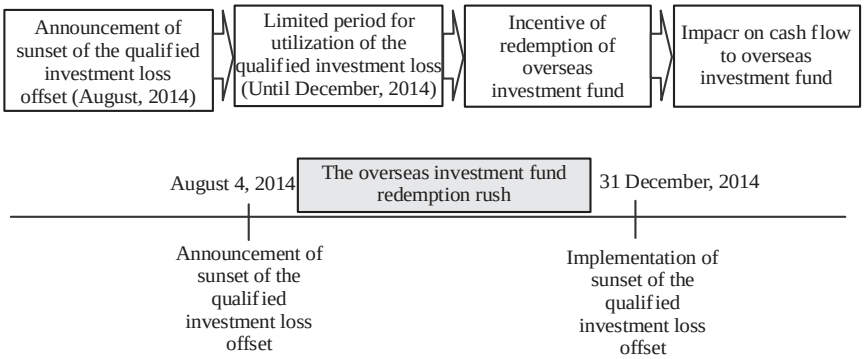

Fig. 1: Conceptual framework for sunset of the overseas investment loss offset

Based on the review of prior studies, more cash outflow from the funds during the period of the announcement of sunset of the investment-loss-offset transitional provision to the actual sunset of said provision may be expected because the period is the last opportunity to realize tax loss. However, less cash outflow is also expected after sunset as there is no opportunity to realize the investment loss for tax purposes (Fig. 1).

When the Korean government publicly announced that the transitional provision would expire on 31 December, 2014 fund investors were expected to become aware that the period when the qualified loss may be utilized would be limited. Thus, they should pursue the redemption of investment funds held to reduce a potential tax increase on their investment income derived from the fund until the moment the actual sunset of the transitional provision takes effect. However, after the sunset of this transitional provision, investors were expected to discontinue the rush of fund redemption because of the lack of opportunity to utilize the qualified loss for tax purposes. Thus, this study develops the following hypotheses:

- **Hypothesis 1:** Cash inflows to overseas investment funds after the announcement of the sunset of the transitional provision relating to the offset of the qualified loss are lower than cash inflows before the announcement
- **Hypothesis 2:** Cash inflows to overseas investment funds before the sunset of the transitional provision relating to the offset of the qualified loss are lower than cash inflows after the sunset

Fund investors are expected to redeem their investment funds to realize the qualified loss offset for tax purposes before it expires as a result of the sunset provision. Our empirical study seeks to confirm the assumption.

MATERIALS AND METHODS

Research model: This study empirically analyzes whether fund investors make their fund investment decision by considering a change in fund taxation. In prior studies, such as Yoon (2014) and Choi *et al.* (2008), AUM fund sales and cash flow of overseas investment funds significantly increased upon the implementation of the temporary tax exemption rule that exempt income from any disposal or evaluation gain on offshore listed shares. The present study examines any change in cash flow to overseas investment funds at the time of the announcement of sunset of the offset of the qualified investment loss (i.e., 6 August, 2014) and the actual sunset of the offset (i.e., 31 December, 2014). To test hypothesis 1, this study utilizes the research model used by Yoon (2014), which is given by:

$$\begin{aligned}\text{Cash flow}_{i,t} &= \alpha_0+\beta_1\times Tax_{i,t}+\beta_2\times Fund_{i,t}+\\ &\beta_3\times(Tax_{i,t}\times Fund_{i,t})+\beta_4\times Return_{i,t}+\beta_5\times Risk_{i,t}+\\ &\beta_6\times Size_{i,t}+\beta_7\times Fee_{i,t}+\beta_8\times Age_{i,t}+\beta_9\times Big_{i,t}+\sum Oper\_D+e_{i,t}\end{aligned} \quad (1)$$

Where:

Cash flow = Weekly net cash inflow to a fund
Tax = Indicator variable set to equal to 1 for the period after the date of the announcement (6 August, 2014) and 0 otherwise
Fund = Indicator variable set to equal to 1 for overseas investment fund and 0 otherwise
Tax×Fund = Interaction term of tax and fund
Return = Weekly rate of return on fund
Risk = Fund risk, standard deviation of weekly rate of return for 3 months
Size = The natural logarithm of fund size (initial net asset value)
Fee = Total amount of fees paid by a fund investor
Age = Number of years elapsed from the inception of a fund and
Big = Indicator variable set to equal to 1 for big 5 asset management company and 0 otherwise

To prove hypothesis 2, the following model is used:

$$\begin{aligned}\text{Cash flow}_{i,t} &= \alpha_0+\beta_1\times Tax_{i,t}+\beta_2\times Fund_{i,t}+\\ &\beta_3\times(Tax_{i,t}\times Fund_{i,t})+\beta_4\times Return_{i,t}+\beta_5\times Risk_{i,t}+\\ &\beta_6\times Size_{i,t}+\beta_7\times Fee_{i,t}+\beta_8\times Age_{i,t}+\beta_9\times Big_{i,t}+\sum Oper\_D+e_{i,t}\end{aligned} \quad (2)$$

Where:

Cash flow = Daily net cash inflow to a fund
Tax = Indicator variable set to equal to 1 for the period before the sunset date (31 December, 2014), 0 otherwise
Return = Daily rate of return on fund and
Risk = Fund risk, standard deviation of daily rate of return for 3 months

The other variables are defined as in hypothesis 1.

Description of variables

Cash flow: This variable has been used in various prior studies to measure investment movement by fund investors. The weekly or daily net flows of cash investments in the funds are

measured. Cash flow is defined as the growth rate of the AUM after adjusting the assets of funds, assuming that all cash flows are invested at the end of the period. When the cash flows increase because of investment in fund, the variable is positive, meanwhile, the variable is negative when the cash flows decrease as a result of redemptions of fund units (Bergstresser and Poterba, 2002; Gruber, 1996). This is expressed as:

$$\text{Cash flow}_{i,t} = \frac{\text{TNA}_{i,t} - \text{TNA}_{i,t-1} \times (1+\text{R}_{i,t})}{\text{TNA}_{i,t-1}}$$

Where:

$\text{Cash flow}_{i,t}$ = Cash flow to fund i during t week or t day

$\text{TNA}_{i,t}$ = Total net asset value of fund i at the end of t week or t day and

$\text{R}_{i,t}$ = Rate of return for fund i for t week or t day

Tax, fund, tax×fund: Tax×fund is the main variable in this research model. Tax is equal to 1 for the period from the date of the announcement of the sunset to the actual date of sunset. Fund is set to 1 for overseas investment funds or 0 otherwise. Accordingly the interaction variable of tax and fund is equal to 1 for overseas investment funds during the period of the announcement date of the sunset up to its effectivity date and 0 otherwise. If the coefficient of the interaction term is negative at the significant level, fund investors consider the sunset of offset of the qualified loss when considering the timing of investment or redemption.

Return: Return refers to a rate of return on a fund to be used as a control variable, similar to the studies by Yoon (2014) and Bergstresser and Poterba (2002). The variable is measured as a weekly or a daily rate of return. The variable may affect the decision-making of fund investors because it is the most representative indicator of profitability of a fund. The variable is expected to have a positive relationship with a cash flow to a fund (Zheng, 1999).

Risk: The risk is measured as a standard deviation of rate of return on a fund as measured in Choi *et al.* (2008). This variable is expected to have a negative relationship with a cash flow to a fund given that a higher standard deviation means a high risk to be borne by each fund investor.

Size: This variable is the natural logarithm of initial net asset value, it is expected to have a positive relationship with a cash flow to a fund, as predicted by Yoon (2014).

Fee: Total fees consist of investment management, sales distribution and asset-management service fees to be paid by fund investors according to the terms and conditions of their investment contracts. As the variable is related to the competency of the investment manager and fund distributor, a positive relationship with a cash flow to a fund is expected (Yoon and Lee, 2011).

Age: This variable indicates the number of years that elapsed from the inception of fund (Yoon and Lee, 2011), it is expected to have an effect on the dependent variable. A positive relationship with the cash flow to a fund is also expected because a fund with a longer age implies more experienced fund managers.

Big: Generally, a large-scale asset management company has greater capability and capacity to obtain useful information for fund investment, including changes in fund taxation. Accordingly, the dummy variable indicating whether a large-scale asset management company manages a fund is expected to have a negative relationship with cash flow during the given period, including the sunset of offset of the qualified investment loss (Cici *et al.*, 2012). The dummy variable is set to 1 if it involves the big 5 asset management companies and 0 otherwise.

Oper_D: Finally, a dummy variable is employed to control the investment management performance of an asset management company, which is expected to affect cash flow to a fund.

Meanwhile, Yoon (2014) did not consider foreign exchange rate factor when he examined any changes in cash flow to a fund or fund sales around the implementation date of the temporary tax exemption rule for income on the evaluation or disposal of offshore-listed shares in an overseas investment fund. However, in calculating the tax basis of the units of an overseas investment fund, gain or loss in relation to the foreign exchange is reflected. Accordingly, the present study sets a separate research model (Model 2) by adding the foreign exchange rate variable to the research model presented previously. As part of the robustness check, this study also analyzes funds set up only before the beginning of the temporary tax exemption rule (i.e., 1 June, 2007) and excludes any fund that may not utilize the qualified losses to offset under the transitional provision. The separate research model (Model 2) is as follows:

$$\text{Cash flow}_{i,t} = \alpha_0+\beta_1\times\text{Tax}_{i,t}+\beta_2\times\text{Fund}_{i,t}+ \beta_3\times(\text{Tax}_{i,t}\times\text{Fund}_{i,t})+\beta_4\times\text{Return}_{i,t}+\beta_5\times\text{Risk}_{i,t}+\beta_6\times\text{Size}_{i,t}+ \beta_7\times\text{Fee}_{i,t}+\beta_8\times\text{Age}_{i,t}+\beta_9\times\text{Big}_{i,t}+\beta_{10}\times\text{Fx}_{i,t}+\sum\text{Oper\_D}+e_{i,t} \quad (3)$$

Where:

Fx = Change in foreign exchange rate during the period from ending date of the temporary tax exemption rule to week (or day) t. This variable is determined as follows:

$$\text{Fx}_{i,t} = \frac{\text{Fx rate at the end of week t (day t)-Fx rate on 31 December, 2009}}{\text{Fx rate on 31 December, 2009}}$$

The Fx variable is measured as a change in the foreign exchange rate since 31 December, 2009. This variable is set in this manner so that the income to be offset by the qualified investment loss covers only those incurred from the ending date of the temporary tax exemption rule (i.e., 31 December, 2009). Therefore, if foreign exchange currency appreciation is against the Korean Won since then (i.e., foreign exchange rate increases since 31 December, 2009), fund investors are more likely to realize the qualified loss by redeeming the overseas investment funds. In this regard, the Fx variable is expected to have a negative relationship with the cash flow to a fund during the announcement and effectivity dates of the sunset.

Sample selection: To examine whether the announcement and implementation of sunset of the transitional provision enabling the offset of qualified loss against any other taxable income incurred within a fund affect the investment decision-making of overseas investment fund investors, this study selects the sample data based on the conditions listed below:

- Onshore domestic equity type funds and onshore overseas equity type funds available four months before the date of announcement (6 August, 2014) and 4 months after the date of announcement (Hypothesis 1)
- Onshore domestic equity type funds and onshore overseas equity type funds available one month before the date of sunset (31 December, 2014) and one month after the date of sunset (Hypothesis 2)
- Funds which provides data corresponding to explanatory variables, such as cash flow in models 1 or model 2 in the Fn spectrum database

In model 2, only data for funds established before 1 June, 2007 are analyzed to test hypothesis 1 and 2.

RESULTS

Table 1 presents the descriptive statistics of the variables used to test hypothesis 1. As indicated, both of mean and median of cash flow have a negative sign, which implies that more cash outflows from the funds were observed that cash inflows to the funds. Both of mean and median value of return are positive. All of Fx variables have a negative sign which means the foreign exchange rate has decreased compared with that in 31 December, 2009. Hence, the appreciation of the Korean Won is relative to that of any non-Korean Won currency.

Table 2 illustrates the correlations for the variables used to test hypothesis 1. The interaction variable of tax and fund has a negative relationship with net cash inflows to the funds during the period of April, 2014 to December, 2014.

Table 1: Descriptive statistics (H 1)

Variables	N	Mean	Standard deviation	Minimum	1st quartile	Median	3rd quartile	Maximum
Cash flow	78662	-0.004	0.023	-0.328	-0.006	-0.001	0.000	0.152
Tax	78783	0.404	0.490	0	0	0	1	1
Fund	78783	0.484	0.499	0	0	0	1	1
Tax×Fund	78783	0.196	0.397	0	0	0	0	1
Return	78783	0.241	5.834	-29.878	-3.387	0.591	3.723	24.150
Risk	77171	12.035	4.097	0	9.413	11.049	13.684	36.577
Size	78728	18.487	4.158	6.907	16.118	19.415	21.526	25.465
Fee	78783	0.826	0.914	0	0	0.295	1.7	2.585
Age	78728	7.563	1.899	4	7	7	8	15
Big	78728	0.387	0.487	0	0	0	1	1
Fx	78783	-0.098	0.024	-0.135	-0.121	-0.095	-0.081	-0.046

Cash flow: Weekly net cash inflow to a fund, Tax: Indicator variable set to equal to 1 for the period after the date of the announcement (6 August, 2014) and 0 otherwise, Fund: Indicator variable set to equal to 1 for overseas investment fund and 0 otherwise, Tax×Fund: Interaction term of tax and fund is set to be equal to 1 for the overseas investment funds during the period of announcement date of the sunset to the effective date of sunset or 0 otherwise, Return: Weekly rate of return on fund, Risk: Fund risk, standard deviation of weekly rate of return for 3 months, Fee: Total amount of fees paid by a fund investor, Age: No. of years elapsed from the inception of a fund, Big: Indicator variable set to equal to 1 for big 5 asset management company and 0 otherwise and Fx: Change in the foreign exchange rate since 31 December, 2009

Table 2: Correlation analysis (H 1)

Variables	Cash flow	Tax	Fund	Tax×Fund	Return	Risk	Size	Fee	Age	Big
Cash flow	0.018***									
Tax	(0.0096)									
Fund	-0.008	0.004								
	(0.2477)	(0.5536)								
Tax×Fund	-0.005	0.451***	0.620***							
	(0.4105)	(<0.0001)	(<0.0001)							
Return	0.00061	-0.236***	0.190***	0.096***						
	(0.9326)	(<0.0001)	(<0.0001)	(<0.0001)						
Risk	-0.002	0.031***	0.412***	0.282***	-0.039***					
	(0.74)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)					
Size	0.010	-0.030***	0.137***	0.084***	0.025***	0.115***				
	(0.1341)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0004)	(<0.0001)				
Fee	-0.027***	0.0003	0.199***	0.123***	0.027***	-0.030***	0.058***			
	(0.0001)	(0.9667)	(<0.0001)	(<0.0001)	(0.0001)	(<0.0001)	(<0.0001)			
Age	0.008	0	-0.361***	-0.223***	-0.063***	-0.185***	0.162***	0.014**		
	(0.2522)	(1)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0436)		
Big	-0.027***	0	-0.072***	-0.044***	-0.012	0.010	0.001	-0.093***	-0.042***	
	(0.0002)	(1)	(<0.0001)	(<0.0001)	(0.0727)	(0.1561)	(0.8749)	(<0.0001)	(<0.0001)	
Fx	0.007	0.481***	0.005	0.222***	-0.483***	0.135***	0	0.00038	0	0
	(0.2799)	(<0.0001)	(0.4501)	(<0.0001)	(<0.0001)	(<0.0001)	(1)	(0.9575)	(1)	(1)

***, **Statistically significant at the 10 and 5% two-tailed level, respectively. Number in the parenthesis indicates p-value, Cash flow: Weekly net cash inflow to a fund, Tax: Indicator variable set to equal to 1 for the period after the date of the announcement (6 August, 2014) and 0 otherwise, Fund: Indicator variable set to equal to 1 for overseas investment fund and 0 otherwise, Tax×Fund: Interaction term of tax and fund is set to be equal to 1 for the overseas investment funds during the period of announcement date of the sunset to the effective date of sunset or 0 otherwise. Return: Weekly rate of return on fund, Risk: Fund risk, standard deviation of weekly rate of return for 3 months, Size: The natural logarithm of fund size (initial net asset value), Fee: Total amount of fees paid by a fund investor, Age: No. of years elapsed from the inception of a fund, Big: Indicator variable set to equal to 1 for big 5 asset management company and 0 otherwise and Fx: Change in the foreign exchange rate since 31 December, 2009

Table 3: Descriptive statistics (H 2)

Variables	N	Mean	Standard deviation	Minimum	1st quartile	Median	3rd quartile	Maximum
Cash flow	36515	-0.008	0.068	-0.901	-0.007	-0.000	0.000	0.456
Tax	36515	0.475	0.499	0	0	0	1	1
Fund	36515	0.653	0.476	0	0	1	1	1
Tax×Fund	36515	0.298	0.457	0	0	0	1	1
Return	36515	0.014	1.016	-16.667	-0.489	0.030	0.554	20.000
Risk	36515	13.744	10.473	6.873	10.938	12.619	15.271	803.369
Size	36515	21.325	3.165	0	19.447	21.718	23.475	28.178
Fee	36515	1.738	0.547	0.124	1.452	1.85	2.168	2.703
Age	36515	8.745	2.239	7	8	8	9	45
Big	36515	0.319	0.466	0	0	0	1	1
Fx	36515	-0.060	0.009	-0.077	-0.070	-0.059	-0.054	-0.042

Cash flow: Daily net cash inflow to a fund, Tax : Indicator variable set to equal to 1 for the period before the sunset date (31 December, 2014) and 0 otherwise, Fund: Indicator variable set to equal to 1 for overseas investment fund and 0 otherwise, Tax×Fund: Interaction term of tax and fund is set to be equal to 1 for the overseas investment funds during the period of announcement date of the sunset to the effective date of sunset or 0 otherwise, Return: Daily rate of return on fund, Risk: Fund risk, standard deviation of daily rate of return for three months, Size: The natural logarithm of fund size (initial net asset value), Fee: Total amount of fees paid by a fund investor, Age: No. of years elapsed from the inception of a fund, Big: Indicator variable set to equal to 1 for big 5 asset management company and 0 otherwise and Fx: Change in the foreign exchange rate since 31 December, 2009

Table 3 demonstrates the descriptive statistics of the variables used to test hypothesis 2. As presented, cash flow has a negative mean with higher standard deviation compared to the Table 1. All of Fx variables also have a negative sign, but the foreign exchange rate has decreased to the lesser degree, compared to the Table 1. Table 4 indicates the correlations for the variables used to test the hypothesis 2.

Similar to the result in the Table 2, the interaction variable of tax and fund has a negative relationship with net cash inflows to the funds during the period of December, 2014 to January, 2015.

Table 5 presents the results of the empirical analysis testing hypothesis 1. In model 1, the interaction variable of tax and fund has a significant negative coefficient at the 99% confidence level. Even in model 2, in which a foreign exchange

Table 4: Correlation analysis (H 2)

Variables	Cash flow	Tax	Fund	Tax×Fund	Return	Risk	Size	Fee	Age	Big
Cash flow										
Tax	0.006									
	(0.2011)									
Fund	-0.056***	-0.052***								
	(<0.0001)	(<0.0001)								
Tax×Fund	-0.030***	0.684***	0.475***							
	(<0.0001)	(<0.0001)	(<0.0001)							
Return	0.005	-0.086***	-0.005	-0.055***						
	(0.2746)	(<0.0001)	(0.2577)	(<0.0001)						
Risk	-0.001	-0.014***	0.170***	0.078***	0.001					
	(0.7483)	(0.005)	(<0.0001)	(<0.0001)	(0.7151)					
Size	0.041***	0.024***	0.170***	-0.116***	0.000	-0.160***				
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0004)	(<0.0001)				
Fee	-0.048***	-0.009*	0.244***	0.120***	-0.005	0.028***	-0.182***			
	(<0.0001)	(0.0707)	(<0.0001)	(<0.0001)	(0.2658)	(<0.0001)	(<0.0001)			
Age	0.024***	-0.196***	-0.475***	-0.383***	0.021***	-0.098***	0.158***	-0.057***		
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)		
Big	-0.018***	-0.000	0.038***	0.019***	-0.011**	-0.027***	0.051***	0.031***	-0.068***	
	(0.0004)	(0.8747)	(<0.0001)	(0.0002)	(0.0342)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	
Fx	0.011**	0.657***	-0.010*	0.4501***	-0.068***	-0.008*	0.014***	0.000	-0.141***	0.000
	(0.023)	(<0.0001)	(0.0514)	(<0.0001)	(<0.0001)	(0.0876)	(0.0068)	(0.8803)	(<0.0001)	(0.8808)

***, **, *Statistically significant at the 10, 5 and 1% two-tailed level, respectively. Number in the parenthesis indicates p-value. Cash flow: Daily net cash inflow to a fund, Tax: Indicator variable set to equal to 1 for the period before the sunset date (31 December, 2014) and 0 otherwise, Fund: Indicator variable set to equal to 1 for overseas investment fund and 0 otherwise, Tax×Fund: Interaction term of tax and fund is set to be equal to 1 for the overseas investment funds during the period of announcement date of the sunset to the effective date of sunset and 0 otherwise, Return: Daily rate of return on fund, Risk: Fund risk, standard deviation of daily rate of return for three months, Size: The natural logarithm of fund size (initial net asset value), Fee: Total amount of fees paid by a fund investor, Age: No. of years elapsed from the inception of a fund, Big: Indicator variable set to equal to 1 for big 5 asset management company and 0 otherwise and Fx: Change in the foreign exchange rate since 31 December, 2009

rate variable is added and the scope of data is limited to the funds incepted only before 1 June, 2007, the interaction variable of tax and fund continues to have a negative coefficient at the 99% confidence level.

Table 6 presents the results of empirical analysis testing hypothesis 2. As can be seen, the interaction variable of tax and fund has a negative coefficient at the 99% confidence level. The result of the empirical analysis from model 2 is consistent with that from model 1. The interaction variable of tax and fund has a negative coefficient at the 95% confidence level in model 2.

DISCUSSION

As presented in Table 5, the interaction variable of tax and fund has a significant negative coefficient in both of model 1 and model 2. This result shows that the cash net inflows to the funds were reduced since 6 August, 2014 when tax authorities announced that the offset of the qualified loss would expire on 31 December, 2014. In other words, fund investors attempted to reduce their tax burden by redeeming their funds after the announcement date upon gaining awareness of the limited period in which to offset a qualified loss in relation to the offshore-listed shares. These results are consistent with Choi *et al*. (2008) and Yoon (2014). As discussed previously, the two prior studies demonstrated that the factor of tax change has significant effects on the capital investment decision by presenting that AUM of the funds, the fund sales and cash flow to the funds increased significantly subsequent to the enactment of the tax exemption rule. As the net cash flows to overseas investment funds after the announcement of the sunset of the tax favorable rule (i.e., the offset of the qualified investment loss) are significantly lower than net cash inflows before the announcement, this study may strengthen the argument that fund taxation should affect investment decision made by fund investors by showing that the announcement may affect the investment decision-making of fund investors.

The coefficient of foreign exchange rate has a positive value at the significant level contrary to the expectation of the study. Such result may be attributed to the fact that the analyzed foreign exchange rates were lower than the foreign exchange rate on 31 December, 2009. Unlike the research environment in Yoon and Kim (2015), the value of the foreign currency depreciated since 31 December, 2009 thus, realizing foreign exchange gain to be offset by the qualified losses at the level of fund investors may be less likely. Therefore, a foreign exchange rate may not affect the

Table 5: Regression analysis result (H 1)

		Model 1		Model 2	
Variables	Expected sign	Coefficient	VIF	Coefficient	VIF
Intercept	+/-	0		0	
		(-4.35)		(-1.28)	
Tax	-	0.07598	1.95365	0.11922	1.89055
		(15.13)***		(15.91)***	
Fund	-	0.04838	2.03107	0.033	2.51697
		(9.45)***		(3.82)***	
Tax×fund	-	-0.08682	2.62389	-0.09934	2.54358
		(-14.92)**		(-11.43)***	
Return	+	-0.01948	1.11379	-0.00226	1.40866
		(-5.14)***		(-0.35)	
Risk	-	0.01374	1.33236	-0.00854	1.31743
		(3.31)***		(-1.37)	
Size	+	-0.03436	1.12338	-0.01709	1.12511
		(-9.03)***		(-2.96)***	
Fee	+	-0.01517	1.09043	-0.01807	1.05164
		(-4.04)***		(-3.23)***	
Age	+	0.00171	1.24003	-0.0065	1.3685
		(0.63)		(-1.02)	
Big	-	-0.028	1.05194	-0.04875	1.03149
		(-7.6)***		(-8.81)***	
Fx	-			0.01169	1.62234
				(1.68)*	
ΣOper		Included		Included	
Adj. R^2		0.006		0.0138	
F- value		52.19		47.31	
No. of sample		77050		33202	

***, **, *Statistically significant at the 10, 5 and 1% two-tailed level, respectively. Number in the parenthesis indicates t-value, Cash flow: Weekly net cash inflow to a fund, Tax: An indicator variable set to equal to 1 for the period after the date of the announcement (6 August, 2014) and 0 otherwise, Fund: An indicator variable set to equal to 1 for overseas investment fund and 0 otherwise, Tax×Fund: Interaction term of tax and fund is set to be equal to 1 for the overseas investment funds during the period of announcement date of the sunset to the effective date of sunset or 0 otherwise, Return: Weekly rate of return on fund, Risk: Fund risk, standard deviation of weekly rate of return for three months, Size: The natural logarithm of fund size (initial net asset value), Fee: Total amount of fees paid by a fund investor, Age: No. of years elapsed from the inception of a fund, Big: An indicator variable set to equal to 1 for big 5 asset management company and 0 otherwise and Fx: Change in the foreign exchange rate since 31 December, 2009

investment decision-making of fund investors in their goal of reducing tax burden.

In both models, big has a negative coefficient at the significant level. Fund investors who invested in funds that are managed by large asset management companies tend to redeem their funds as advised by companies that have a higher capability to counsel customers from a tax perspective. This is in line with Cici *et al.* (2012) which demonstrated that financial advisors provide useful tax advice to their clients.

Table 6 provides similar implications. Given that the interaction variable of tax and fund has a negative coefficient, net cash inflows to overseas investment funds were lower one month before the sunset date compared with that one month after the sunset date. This may be interpreted that fund investors redeemed their funds before the sunset of the offset of qualified loss to take advantage of the transitional provision but discontinued their fund redemption after the sunset because the offset is no longer applicable. In other words, fund investors rushed to redeem their investments before 31 December, 2014 to utilize the offset of the qualified loss in relation to the offshore-listed shares and then reduced their redemptions after the sunset, which is consistent with this analysis of Table 5. These same results were confirmed in another empirical analysis (i.e., model 2), in which funds established only before the beginning date (i.e., 1 June, 2007) of the temporary tax exemption for income from offshore-listed shares were analyzed and foreign exchange factors are considered.

The foreign exchange rate variable has a positive coefficient, which may be due to the fact that the tested period includes a time when the offset was no longer applicable and the appreciation of non-Korean Won currencies intensified since 31 December, 2014.

Similar to the results from Table 5, big has a negative coefficient. It implies that fund investors redeemed their funds as advised by large asset management companies that have higher capabilities to provide effective tax counsel to their customers as discussed in Cici *et al.* (2012).

Table 6: Regression analysis result (H 2)

		Model 1		Model 2	
Variables	Expected sign	Coefficient	VIF	Coefficient	VIF
Intercept	+/-	0		0	
		(7.54)		(-0.72)	
Tax	-	0.0000	6.62451	0.01184	3.79826
		(0)		(1.16)	
Fund	-	-0.0065	2.43435	-0.03001	2.45564
		(-1.53)		(-3.67)***	
Tax×Fund	-	-0.0405	7.39654	-0.02515	3.70963
		(-5.46)***		(-2.5)**	
Return	+	0.0004	1.00246	0.00584	1.00832
		(0.15)		(1.11)	
Risk	-	0.0034	1.06997	0.01041	1.04725
		(1.21)		(1.95)*	
Size	+	0.0219	1.21206	0.02695	1.11795
		(7.31)***		(4.88)***	
Fee	+	-0.0521	1.18687	-0.0327	1.08937
		(-17.53)***		(-6)***	
Age	+	-0.0800	1.62334	-0.00116	1.39782
		(-23.01)***		(-0.19)	
Big	-	0.0015	1.01048	-0.01687	1.01158
		(0.57)		(-3.21)***	
Fx	-			0.01512	1.76596
				(2.18)**	
ΣOper		Included		Included	
Adj. R^2		0.0107		0.0057	
F-value		160.63		21	
No. of sample		132,696		36,515	

***, **, *Statistically significant at the 10, 5 and 1% two-tailed level, respectively. Number in the parenthesis indicates t-value, Cash flow: Daily net cash inflow to a fund, Tax: An indicator variable set to equal to 1 for the period before the sunset date (31 December, 2014) and 0 otherwise, Fund: An indicator variable set to equal to 1 for overseas investment fund and 0 otherwise, Tax×Fund: Interaction term of tax and fund is set to be equal to 1 for the overseas investment funds during the period of announcement date of the sunset to the effective date of sunset or 0 otherwise, Return: Daily rate of return on fund, Risk: Fund risk, standard deviation of daily rate of return for three months, Size: The natural logarithm of fund size (initial net asset value), Fee: Total amount of fees paid by a fund investor, Age: No. of years elapsed from the inception of a fund, Big: An indicator variable set to equal to 1 for big 5 asset management company and 0 otherwise and Fx: Change in the foreign exchange rate since 31 December, 2009

CONCLUSION

This study examined whether a change in fund taxation affects fund investor's investment decision-making by analyzing changes in cash flow to the overseas investment funds resulting from the sunset of the offset of the qualified loss derived from the evaluation or disposal of offshore-listed shares, which occurred from 1 June, 2007 to 31 December, 2009.

In analyzing the effect of the sunset of the transitional provision, which enabled the qualified loss from the offshore listed shares to be offset against any other income derived from the overseas investment fund investment, this study results indicated that cash flows to the overseas investment funds subject to the sunset provision were significantly decreased for the period following the announcement of the sunset to the actual sunset. Such finding suggests fund investors attempted to reduce their tax burden by using the built-in losses from offshore listed shares through the redemption of fund units upon realizing that the period for loss offset was being limited by the sunset provision.

This study is meaningful in investigating whether fund investments are actually affected by the change in fund taxation when investors expect the expiration of the favorable tax rule. To the best of our knowledge, this study is the first in Korea to investigate whether fund investments are actually affected by the change in fund taxation when investors expect the expiration of the favorable tax rule. The finding in the present study demonstrates that a change in fund taxation affects the decision-making of fund investors even in the case of the sunset of the qualified loss in relation to offshore-listed shares.

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