Index Funds and Exchange Traded Funds; Substitutability and Reasons for the Coexistence

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Abstract.

This research studies the substitutability and reasons for the coexistence of two similar investment vehicles, conventional index funds and exchange traded funds (ETFs), in the Korean market. The major findings of this study are as follows. First, ETFs and conventional index funds generally track their underlying indexes closely and furthermore, the mean of tracking errors are not statistically different between the two. Second, cash flows to one type of fund do not affect the cash flows of the other, indicating that conventional index funds and ETFs are not substitutes for each other. Third, the coexistence of ETFs and index funds can be explained by the behavior of fund investors who prefer different characteristics of these funds.

Key Words: Index funds, ETFs, Substitution effect, Fund Cash Flow, Investor Behavior

1. Introduction

Stock investors in Korea find that direct investment becomes more difficult because not only has Korea's market become more efficient, but also stock market volatility is further increasing due to the frequent international financial shocks coming from abroad. They also find that hiring active fund managers do not reward them, as active funds, on average, underperform the market index when the management fee is subtracted. As a consequence, passive funds, such as the index fund and ETFs (Exchange traded funds), have attracted many investors and have also become the fastest-growing segment of the Korean capital market. ETFs and index funds are both publicly traded mutual funds whose operational goals are to passively track a market benchmark in order to generate daily returns matching a market index (e.g., KOSPI 200). Thus, the research question for this study is raised. Why do ETFs and index funds coexist in the market at similar sizes in spite of their almost same service feature? Thus, it is our interest to find out the reasons as to why the seemingly same two investment vehicles coexist.

2. Methodology

2.1. Substitution effect over the study period

In this study, the substitution effect is examined by comparing the fund cash flow effect of index funds and ETFs (Agapova, 2011) toward each other. We run a regression, where the cash flow of index fund i (or ETF i) at time t is the dependent variable and the cash flows of ETF i (or index fund i) at time t is the independent variable, as shown in equation (1):

$$\begin{aligned} FlowIF(ETF)_{i,t} &= \alpha_{i,t} + \beta_1 FlowETF(IF)_{i,t} + \beta_2 FlowIF_{i,t-1} + \beta_3 FlowETF_{i,t-1} \\ &+ \beta_4 FlowIndustry_{i,t} + \beta_5 TargetRet_{i,t-1} + \beta_6 IF(ETF)Ret_{i,t} + \beta_7 IF(ETF)Ret_{i,t-1} \\ &+ \beta_8 Expenses_{i,t} + \beta_9 LogNAV_{i,t} + \beta_{10} IR_{i,t} + \varepsilon_{i,t}. \end{aligned} \quad (1)$$

$$Flow_{i,t} = \frac{NAV_{i,t} - NAV_{i,t-1} \times (1 + R_{i,t})}{NAV_{i,t-1}}. \quad (2)$$

Equation (2) is used to calculate the cash flows using the conventional methodology in Sirri and Tufano (1998). In equation (1), the cash flow of ETF (or IF) i at time t, $FlowETF\,(IF)_{i,t}$, is the main explanatory variable and $FlowIF_{i,t-1}$ and $FlowETF_{i,t-1}$ are the control variables due to the persistency of cash flows (Cashman et al., 2007). $FlowIndustry_{i,t}$ is the cash flows of the fund market as a whole, which can represent the level of fund investments and investor' confidence about the fund investment at time t. $TargetRet_{i,t-1}$ is the return of benchmark in the previous period, which shows the recent performance of the benchmark index. $IF(ETF)Ret_{i,t}$ and $IF(ETF)Ret_{i,t-1}$ indicate the rate of return (=performance) of index fund(ETF) i at time t and $t-1$,which shall directly influence the dependent variable. $Expenses_{i,t}$ is the total expenses of fund i and $LogNAV_{i,t}$ is the logarithm of the total net asset value, which is used to control the fund size effect. Lastly, we add Information ratio ($IR_{i,t}$) as an additional control variable for the risk adjusted fund performance.

2.2. The behavior of ETFs and index fund investors

We also try to explain the coexistence of ETFs and index funds by observing the behavior of fund investors. We expect that there may be different determinants for ETFs and index funds from the investor's perspective. First, we run the regression (3) in order to examine the

relation between the cash flow of ETF and fund characteristics, which can influence the ETF investment decisions. The fund characteristics variable includes fund performance ($fundPerf_{i,t-1}$), fund size ($fundTNA_{i,t-1}$), fund family size ($FamTNA_{i,t-1}$), fund ages ($fundage$), fund expense ($expense_{i,t-1}$) and the new ETF (First):

$$FlowETF_{i,t} = \alpha_{i,t} + \beta_1 flow_{i,t-1} + \beta_2 fundPerf_{i,t-1} + \beta_3 fundTNA_{i,t-1} + \beta_4 FamTNA_{i,t-1} + \beta_5 fundage + \beta_6 expense_{i,t-1} + \beta_7 First + \varepsilon_{i,t}. \quad (3)$$

The cash flow of ETF i at time $t-1$ ($flow_{i,t-1}$) is used as a control variable due to the persistency of cash flows (Cashman et al., 2007). We use the risk-adjusted return calculated from the three-factor model (Fama and French, 1993) as a measure of fund performance.

$fundTNA_{i,t-1}$ and $FamTNA_{i,t-1}$ are the logarithms of the lagged total net asset value of the fund and the fund family, which manage fund i. The variable $fundage$ is the number of years since the fund launch date. $expense_{i,t-1}$ is the lagged total expenses. $First$ is a dummy variable, which is 1 if ETF is the first launched product among the ETFs that track the same benchmark. The first launched ETF usually take advantage as a result of the first occupation effect.

With regard to the cash flow of index funds, we run the regression (4):

$$FlowIF_{i,t} = \alpha_{i,t} + \beta_1 flow_{i,t-1} + \beta_2 fundPerf_{i,t-1} + \beta_3 fundTNA_{i,t-1} + \beta_4 FamTNA_{i,t-1} + \beta_5 fundage + \beta_6 expense_{i,t-1} + \beta_7 bigvendor + \varepsilon_{i,t}. \quad (4)$$

Here, we use $bigvendor$ as a new independent variable instead of the First variable in equation (3). The variable $bigvendor$ represents the dummy variable, which is 1 if the fund is sold by the financial institution whose TNA is over 0.8 billion. We expect that the channel of distribution is an important determinant because the cash flow of index funds may depend on the distribution power of the vendor.

3. Test Results

3.1 Data

This study uses the matching sample of ETFs and index funds, which track the same benchmarks. There are a total of 6 benchmarks in this study, which are KOSPI200, KRX100, MKF Mid Value, MKF Blue chip30, MKF Green Index and Socially Responsible Index. The majority of ETFs and index funds in our sample follow KOSPI200 as their benchmark (16 ETFs and 399 index funds). Other than KOSPI200, the other indexes are followed by a small number of ETFs and index funds. Our study period spans from January 2006 to December 2011. We collect the fund return, net asset value, expenses and benchmark data from KRX and Zeroin.

3.2 Substitution effect over the study period

Table 1 reports the results for the substitution effect on the net flows to funds over the study period. To control for the endogenous problem, as flows to index funds and ETFs enter both equations as dependent and explanatory variables, the SUR (Seemingly Unrelated Regression) approach is used to test the substitution effect. Although coefficients β_1 on index funds and ETFs are negative in both equations, they are not statistically significant, implying that there is no significant substitution effect. Thus, the result is not consistent with the previous study of Agapova (2011). Therefore, unlike in the U.S. market, we suggest that index funds and ETFs are not substitutes in the Korean fund market. This result can be explained by the different organizational structure and characteristics between ETFs and index funds in the Korean market. In Korea, ETFs are often conceived as a short-term investment instrument. On the other hand, index funds in Korea are used as middle or long-term investment vehicles because the fund redeemed in the short-term is subject to penalty. Therefore, different investor groups appear to exist with different appetites for two very similar investment vehicles and they do not seem to consider ETFs and index funds as substitutes for each other.

Table 1. Substitution effect over the study period

	FlowIF	*FlowETF*

	OLS	SUR	OLS	SUR
Intercept	10,731 (0.09)	0	-0.0162** (-2.37)	0.0025*** (5.58)
FlowETF	-2,123 (0.00)	-11,712 (-0.03)		
FlowIF			-0.000000001 (-0.10)	-0.0000 (-0.03)
$FlowETF_{t-1}$	246,454 (0.61)	264,136 (0.62)	0.0168* (1.65)	0.0717*** (42.25)
$FlowIF_{t-1}$	0.0046 (0.05)	0.0047 (0.05)	-0.00005 (-1.36)	0.00000002*** (4.72)
FlowIndustry	-1.7784 (-1.22)	-1.8414 (-1.23)	0.00000007 (1.02)	0.00000015*** (25.1)
$TargetRet_{i,t-1}$	291,735 (0.09)	253,830 (0.07)	-0.4797** (-2.07)	-1.0453*** (-76.26)
Ret	-775,885 (-0.25)	-767,004 (-0.24)	-0.4955** (-2.17)	0.0199 (1.54)
Ret_{t-1}	190,752 (0.19)	216,501 (0.21)	0.9218*** (20.64)	0.8149*** (211.73)
Expense	-4,259,552 (-0.50)	-4,438,926 (-0.52)	-0.5814 (-0.26)	-0.0137 (-0.39)
LogNAV	967.18 (0.17)	1,535.52 (0.95)	0.0016*** (3.34)	0.00005 (2.41)
IR	17,455 (0.56)	17,635.4 (0.55)	0.0003 (0.21)	-0.0005*** (-3.57)
$Adj.R^2$	-0.00003		0.0919	
$Sys.w.R^2$		0.00582		0.00582

3.3. The Behavior of ETFs and Index Fund Investors

In this section, we turn our attention to individual investors' behavior in order to explain the coexistence of two funds. The regression results of fund cash flows on a number of fund characteristics are presented in Table 2. For the cash flow of ETFs, the coefficient of $flow_{i,t-1}$ is positive and statistically significant. This indicates that the cash flow of ETFs is influenced by the past flow of ETF itself. Also, the coefficients of $fundPerf_{i,t-1}$ is statistically significant at the 1% level. This supports the hypothesis, that the past fund performance of ETFs and the cash flow to the ETFs are positively related. This is in line with the previous studies of Sirri and Tufano (1998) and Ippolito (1992). The coefficient for $FamTNA_{i,t-1}$ is also statistically positive (Chen et al., 2004), meaning that ETFs investors take the past fund excess return and family size into consideration when they choose an ETF. Surprisingly, the

coefficient for $expense_{i,t-1}$ is positive. This result might be due to a characteristic of the Korean ETF market, where management fees are not very distinct across ETFs.

Meanwhile, as shown in the second columns, the cash flow of index funds are positively related with $fundTNA_{i,t-1}$, *fundage* and *bigvendor*. This result can be understood in line with the previous study of Goetzmann et al. (1997), which find the cognitive dissonance of mutual fund investors. Many fund investors choose the index fund recommended by banks or brokers and therefore, the cash flow of index fund (FlowIF) is positively related with the vendors. Furthermore, vendors usually recommend the index fund that has a bigger size and has reasonably a long track record. Overall, we find that the determinants for the ETF investment and index fund is different, which make the two investment vehicles coexist separately as each product is sold to a different group of investors as well as through a different course of distribution

Table 2. The Behavior of ETFs and Index Fund Investors

	$FlowETF_t$	$FlowIF_t$
Intercept	-0.0128*	367,082
	(-1.85)	(0.77)
$flow_{i,t-1}$	0.0669*	-0.0036
	(1.79)	(-0.04)
$fundPerf_{i,t-1}$	0.2032***	1,613
	(4.88)	(0.03)
$fundTNA_{i,t-1}$	0.00002	124,024***
	(0.17)	(8.47)
$FamTNA_{i,t-1}$	0.0008*	57,285
	(1.80)	(1.53)
fundage	-0.0000003	53.54**
	(-0.95)	(2.57)
$expense_{i,t-1}$	1.3469*	-4,902,530
	(1.90)	(-0.57)
First	-0.0002	
	(-0.62)	
bigvendor		79,695**
		(2.00)
Obs.	9,182	292,319
$adj.R^2$	0.0043	0.0023

4. Conclusion

This paper analyzes the substitutability and coexistence of two similar investment vehicles that are conventional index funds and exchange traded funds (ETFs) in the Korean market. Our major findings are as follows.

First, the mean of tracking errors are not statistically different between the fund types, indicating that ETFs and conventional index funds generally track their underlying indexes closely. Second, we find that conventional index funds and ETFs are not substitutes, and flows to one fund type do not affect the flow to the other. Third, the coexistence can be explained by the behavior of fund investors who prefer different characteristics of these funds - we discover that while the cash flow of ETFs is influenced by fund performance, fund family performance and fund expense, the cash flow of index funds is influenced by fund size, fund age and the existence of big vendors. Overall, this paper contributes to the literature by providing a plausible explanation of the coexistence of the seemingly indifferent investment vehicles.

References

[1] Agapova, A.: Conventional Mutual Index Funds versus Exchange Traded Funds. Journal of Financial Markets. 14, 323--343 (2011)

[2] Chen, J., Hong, H., Huang, M., Kubik, J. Does Fund Size Erode Performance? Liquidity, Organizational Diseconomies, and Active Money Management. American Economic Review 94,1276--1302(2004)

[3] Goetzmann, W. N., Peles, N.: Cognitive Dissonance and Mutual Fund Investors. Working paper (1997)

[4] Ippolito, R.: Consumer Reaction to Measures of Poor Quality: Evidence from the Mutual Fund Industry. Journal of Law and Economics 35, 45--70(1992)

[5] Sirri, E., Tufano, P.: Costly Search and Mutual Funds Flows. Journal of Finance 43(5), 1589--1622 (1998)

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