Do ESG Funds Deliver? Evidence from Japanese Equity Mutual Funds

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***Abstract*—This study investigates the performance and structural characteristics of ESG funds in Japan's mutual fund market over the period 2015–2023. Using detailed securities holdings data, we classify 818 equity mutual funds into three groups—Active, Passive, and ESG—based on investment style and ESG orientation. We evaluate fund-level attributes including CSP and ESG scores, asset size, industry concentration (HHI), excess returns, realized volatility, alpha under the Fama-French six-factor model, idiosyncratic volatility, and expense ratios. Our findings reveal that while ESG funds exhibit higher CSP and ESG scores than non-ESG active funds, they do not outperform passive funds in terms of sustainability metrics. Moreover, ESG funds underperform in realized returns and alpha, while incurring higher expense ratios. These results persist even after controlling for fund style and disclosure timing via propensity score matching. Contrary to popular belief, the notion that ESG funds deliver superior long-term returns may be more myth than reality. The evidence suggests that investors in ESG funds face a dual disadvantage: lower performance and higher costs.**

***Keywords*— ESG investment, Mutual Fund, Performance Evaluation.**

I. Introduction

While the significance and necessity of ESG investing are widely acknowledged, a key concern lies in how to identify and exclude so-called "greenwashed" funds—those that merely adopt ESG or SDGs-related terminology to attract investor attention without substantive ESG integration. In response to this issue, Japan's Financial Services Agency (FSA) revised its "Comprehensive Supervisory Guidelines for Financial Instruments Business Operators" in March 2023, explicitly defining the scope of ESG-related mutual funds and outlining a policy to eliminate funds deemed greenwashed. However, the very need for such regulatory revision may itself be interpreted as evidence that investors harbor suspicions about the authenticity of certain ESG funds. This underscores the social necessity of verifying the attributes of funds that claim to be ESG-oriented.

Even if a fund is not greenwashed, it remains essential to assess whether ESG funds possess superior ESG characteristics compared to conventional passive or active funds. If ESG funds do not exhibit meaningful differences in ESG attributes relative to existing products, the rationale for establishing ESG-labeled funds becomes questionable.

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Based on these concerns, this study conducts an empirical analysis of Japanese domestic equity mutual funds, using detailed portfolio holdings data to evaluate their ESG characteristics. Until the early 2010s, information on fund holdings was largely inaccessible to general researchers. However, in recent years, portfolio data disclosed in management reports has been systematically compiled into databases, enabling portfolio-based performance evaluation. This study utilizes detailed securities holdings data and a proprietary Corporate Social Performance (CSP) index constructed from Toyo Keizai's CSR survey results to assess the ESG characteristics and fund-level controls of domestic equity mutual funds.

If ESG funds are not greenwashed and indeed possess superior ESG attributes, the next question is whether they deliver superior investment performance compared to conventional active and passive funds. Can investors expect higher returns from ESG investing? Or should individual investors accept lower returns in exchange for contributing to broader societal improvement through ESG investment? To date, there has been limited empirical discussion addressing these questions. Moreover, it is necessary to examine whether the management fees charged by ESG funds are commensurate with their performance.

This study evaluates the performance of passive, active, and ESG funds using a return-based approach, employing the six-factor model proposed in [5], [6] as a benchmark pricing framework. The goal is to determine whether ESG investing has delivered relatively superior performance compared to conventional fund strategies.

The empirical results reveal no clear evidence of greenwashing among domestic equity mutual funds that are explicitly labeled as ESG. However, the Corporate Social Performance of ESG funds is comparable to that of passive funds and not particularly superior. Furthermore, the risk-adjusted returns of ESG funds are, on average, inferior to those of both passive and active funds. These findings do not support the view that ESG investing yields higher risk-adjusted returns.

The remainder of this paper is structured as follows. Section II describes the securities holdings data used in this study and the methodology for identifying fund attributes. Section III classifies domestic equity mutual funds into ESG and non-ESG categories based on investment style and examines the current state of ESG investing in Japan's mutual fund market. Section V assesses the relative performance of ESG funds compared to other active funds by employing propensity score matching method. Finally, Section VI concludes with a discussion on the

https://doi.org/10.17758/URUAE30.UA1225104

necessity of ESG funds and their relevance for individual investors.

II. Fund Attribute Analysis Using Detailed Securities Holdings Data

The dataset used in this study was obtained from NTT Data Abic Co., Ltd., specifically from the FundMonitor database. We utilize data available from the tables "Fund Attributes," "Monthly Returns," and "Detailed Securities Holdings." The sample is restricted to funds for which detailed holdings are disclosed and for which all variables necessary for subsequent analysis—such as investment style and management fee rate—are available.

The detailed securities holdings are based on information disclosed in the fund's management reports. By using this data, we can identify the market value of each individual security held by a fund at the time of disclosure. Letting n denote the number of securities held in the portfolio, we calculate the weight w_i of the i-th security. The portfolio weight vector w is then defined as:

$$w = (w_1, w_2, \ldots, w_n)^t \in R^n \tag{1}$$

In this study, fund attributes are defined in relation to the six-factor model examined in Fama and French (2018), as shown in equation (2).

$$\begin{aligned} r_{jt} - r_{ft} = \; & \alpha_j + \beta_j (r_{Mt} - r_{ft}) + \beta_j^{SMB} SMB_t \\ & + \beta_j^{HML} HML_t + \beta_j^{RMW} RMW_t \\ & + \beta_j^{CMA} CMA_t + \beta_j^{UMD} UMD_t + \varepsilon_{j,t} \end{aligned} \tag{2}$$

The Fama and French six-factor model consists of the market factor, the SMB factor representing the size effect, the HML factor representing the value effect, the RMW factor capturing operating profitability, the CMA factor reflecting asset growth, and the UWD factor accounting for the momentum anomaly. To capture the characteristics of individual securities corresponding to factors two through six, we utilize five firm-level attributes: the logarithm of market capitalization (lnMV), book-to-price ratio (BM), return on equity based on operating profit (OP), asset growth rate (INV), and realized stock return over the past year (PR1YR).

Next, the ESG characteristics of funds are measured using a five-dimensional Corporate Social Responsibility (CSP) evaluation index employed in [7], which includes: Employee Relations (EMP), Environmental Preservation (ENV), Social Contribution (SC), Security of the firm and product safety (SS), and Internal Governance (IG). These dimensions are also aggregated into a composite CSP score (CSP). In addition, the Refinitiv ESG Score (ESG) is used as a complementary measure.

Let x_i denote any of the firm-level attributes for the i-th company—namely, the fund characteristics (lnMV, BM, OP, INV, PR1YR), CSP dimensions (CSP, EMP, ENV, SC, SS, IG), or the Refinitiv ESG score (ESG). Let MV_i represent the market value of the i-th security held in the fund, as obtained from the detailed securities holdings data. Then, the corresponding fund-level attribute is calculated according to equation (3) below.

$$x = \sum_{i=1}^{n} \frac{MV_i}{\sum_{i=1}^{n} MV_i} x_i = \sum_{i=1}^{n} w_i x_i = w^t x \tag{3}$$

III. Active and ESG Funds in Japan's Mutual Fund Market

Table 1 presents the number of funds by style classification as defined by NTT Data Abic. During the analysis period from 2015 to 2023, a total of 956 domestic equity mutual funds were identified as having at least one instance of available detailed securities holdings data. Of these, 138 funds lacking essential information—such as investment style and management fee rate—were excluded, resulting in a final sample of 818 funds.

Among the 818 funds analyzed, 572 were classified as active funds, corresponding to four style categories: "Free & Mix," "Value," "Growth," and "Other Active." In contrast, passive funds were subdivided into five style categories based on their benchmark indices (TOPIX, Nikkei 225, JPX400, regional economic indices, and other indices), totaling 246 funds.

ESG fund classification was conducted based on fund names containing explicit keywords such as "ESG," "SRI," or "SDGs." In addition, funds whose names suggested ESG orientation were further examined using prospectuses and other documentation to confirm their classification. As a result, 30 of the 572 active funds were identified as ESG funds (12 Free & Mix, 4 Value, and 14 Growth). Furthermore, six passive funds benchmarked against ESG indices were identified. In total, 36 funds in the sample were classified as ESG funds for the purpose of this study.

In the following sections, based on the results presented in Table 1, we define three fund groups (FundG) as follows: the 542 active funds not classified as ESG are grouped as "Active"; the 36 ESG funds—comprising 30 active ESG funds and 6 passive ESG funds—are grouped as "ESG"; and the remaining 240 passive funds, excluding the 6 passive ESG funds from the total of 246, are grouped as "Passive." The subsequent analysis examines whether there are significant differences in the distribution of fund attribute values across the three fund groups: "Active," "ESG," and "Passive."

TABLE I. NUMBER OF FUNDS BY INVESTMENT STYLES

	Style	#Funds	Non-ESG	ESG
Active Fund	Free&Mix	207	195	12
	Value	149	145	4
	Growth	214	200	14
	Other Active	2	2	0
Passive Fund	TOPIX	79	79	0
	NK225	69	69	0
	JPX400	15	15	0
	Regional Economy	13	13	0
	Other Index	70	64	6

During the analysis period from 2015 to 2023, a total of 956 mutual funds had at least one instance of available detailed securities holdings data. After excluding 138 funds for which key information—such as investment style and management fee rate—was unavailable, the final sample consists of 818 funds.

IV. Active and ESG Funds in Japan's Mutual Fund Market

Table 2 summarizes the distribution of Corporate Social Performance (CSP) scores and ESG scores for individual funds, based on detailed securities holdings data. It is important to note that fund attribute values are measured at the time of disclosure in each fund's management report, and therefore the number of observations (i.e., disclosure instances) varies across funds.

Looking first at the distribution of the composite CSP score (CSP) presented in Table 2, the average score for active funds is 1.423, indicating that even active funds tend to include publicly listed companies with relatively high CSP characteristics. The average CSP score rises to 1.837 for ESG funds, and no funds suspected of greenwashing were identified. However, the average CSP score for passive funds is even higher at 1.926. When comparing ESG and passive funds, the 25th percentile CSP score is higher for passive funds, and the median scores are nearly identical. At the 75th percentile, ESG funds score 2.283 versus 2.172 for passive funds, suggesting that some ESG funds exhibit superior CSP characteristics relative to passive funds. Nonetheless, overall, ESG funds do not consistently record higher CSP scores than passive funds.

This pattern is also observed across the five CSP sub-dimensions: Employee Relations (EMP), Environmental Preservation (ENV), Social Contribution (SC), Security and Product Safety (SS), and Internal Governance (IG). In all five categories, the average scores for ESG funds are lower than those for passive funds. Median scores are nearly equivalent, while ESG funds outperform at the 75th percentile. In aggregate, ESG funds demonstrate clearly higher CSP scores than active funds, but their superiority over passive funds is not consistently evident.

Similarly, while ESG funds record higher Refinitiv ESG scores than active funds, the difference relative to passive funds is less pronounced and not clearly significant.

TABLE III. DISTRIBUTION OF CSP AND ESG SCORES BY INVESTMENT STYLE

CSP Dim.	FundG	Mean	25%ile	Median	75%ile
CSP	Active	1.141	0.386	1.423	1.875
	ESG	1.760	1.558	1.961	2.208
	Passive	1.347	0.143	1.747	1.965
EMP	Active	0.722	0.247	0.879	1.200
	ESG	1.094	0.887	1.205	1.411
	Passive	0.836	0.069	1.043	1.221
ENV	Active	0.645	0.166	0.771	1.062
	ESG	1.014	0.882	1.116	1.272
	Passive	0.769	0.104	0.993	1.120
SC	Active	0.740	0.230	0.941	1.236
	ESG	1.139	1.011	1.273	1.488
	Passive	0.906	0.135	1.161	1.305
SS	Active	0.719	0.266	0.930	1.223
	ESG	1.131	1.021	1.291	1.462
	Passive	0.871	0.022	1.115	1.253
IG	Active	0.857	0.283	1.076	1.476
	ESG	1.368	1.204	1.559	1.810
	Passive	1.038	0.000	1.280	1.557
Refinitive ESG	Active	39.213	26.591	43.662	54.421
	ESG	52.478	46.729	56.139	64.289
	Passive	47.987	38.039	53.616	60.590

Fund classification (FundG) is based on the breakdown shown in Table 1: the 36 funds identified as ESG funds are categorized as "ESG"; active funds not classified as ESG are categorized as "Active"; and passive funds excluding ESG funds are categorized as "Passive." lnMV denotes the logarithm of market capitalization; BM is the book-to-price ratio; OP is return on equity based on operating profit; INV is the asset growth rate; PR1YR is the realized stock return over the past year. CSP refers to the composite Corporate Social Performance score; EMP represents Employee Relations; ENV is Environmental Preservation; SC is Social Contribution; SS is Security and Safety of Products; and IG is Internal Governance.

V. Evaluating the Investment Performance of ESG Funds

In the previous section, we observed that the average CSP score of ESG funds is sufficiently higher than that of active funds. However, the difference relative to passive funds is limited. Based on this finding, it is reasonable to conclude that the ESG funds analyzed in this study are not falsely labeled or greenwashed. The next question, then, is whether investors can achieve higher returns from ESG funds compared to conventional active and passive funds.

In this section, we examine whether ESG funds differ from other active funds with respect to the following variables: Corporate Social Performance (CSP) score, ESG score, Asset under Management (AUM), industry concentration measured by the Herfindahl-Hirschman Index (HHI), excess return over the risk-free rate (RRet), realized volatility (RVol), alpha

estimated under the Fama-French six-factor model (Alpha), idiosyncratic volatility (IVol), and expense ratio (Expense). These comparisons are conducted using Student's t-tests.

It should be noted, however, that as indicated by the number of management reports (NReport) in the bottom row, the sample sizes for ESG funds and non-ESG active funds differ substantially. To address this imbalance, we calculate propensity scores using fund style, the disclosure date of the management report, and the number of dividend payments per year. Based on these scores, we construct a one-to-one matched sample and perform t-tests on the matched pairs. The results are presented in Table 3.

As shown in Table 3, there are statistically significant differences between ESG funds and other active funds across all variables except realized volatility (RVol). Both the CSP score and ESG score are higher for ESG funds, indicating that these funds actively incorporate companies with strong ESG or CSP characteristics into their portfolios. However, the average fund size (AUM) for ESG funds remains relatively small, at approximately 1.8 billion yen, compared to larger active funds.

In terms of performance, ESG funds underperform by approximately 1% in realized returns and by about 1.6% in Jensen's alpha. Furthermore, the average expense ratio for ESG funds is roughly 0.3% higher than that of other active funds. It is important to note that both realized returns and Jensen's alpha are calculated using pre-expense returns. Therefore, if individual investors were to invest in ESG funds, they would likely face a double disadvantage—lower realized returns and higher fees—making it difficult to achieve the high returns they might expect.

The notion that ESG funds can deliver superior investment performance may be nothing more than a myth. In fact, the empirical data presented here suggests the opposite: ESG funds tend to underperform, both in terms of return and cost efficiency, relative to their non-ESG active counterparts.

TABLE III. PERFORMANCE GAP BETWEEN ESG FUNDS AND NON-ESG FUNDS

	All Sample (Management Report)			
	ESG Fund	Non-ESG Fund	*t*-stat	*p*-value
CSP	1.849	1.221	12.328	0.000
ESG	53.237	42.434	9.409	0.000
AUM	1783.639	10426.113	-12.185	0.000
HHI	1603.124	2988.124	-18.116	0.000
RRet	9.105	10.272	-2.145	0.033
RVol	16.049	16.203	-0.903	0.368
Alpha	-1.641	-0.067	-7.364	0.000
IVol	3.282	4.841	-12.428	0.000
Expense	1.590	1.256	14.185	0.000

TABLE 3. (Continued.)

	Propensity Score Matching			
	ESG Funds	Non-ESG Funds	*t*-stat	*p*-value
CSP	1.849	1.418	-5.869	0.000
ESG	53.237	47.247	-3.771	0.000
AUM	1783.639	2788.954	2.478	0.014
HHI	1603.124	2658.090	4.819	0.000
RRet	9.105	10.591	2.015	0.045
RVol	16.049	16.064	0.057	0.955
Alpha	-1.641	0.320	5.982	0.000
IVol	3.282	4.346	4.325	0.000
Expense	1.590	1.571	-0.430	0.668
NReports	166	166		

CSP: Composite CSP Score, ESG: Refinitive ESG Score, AUM: Asset under Management in Million JPY, HHI: Hirfindahl Hirshman Index, RRet: Realized excess return, RVol: Realized Volatility, Alpha: Jensen's Alpha, Ivol: Idiosyncratic volatility.

VI. DO INVESTORS NEEDS ESG UNDS?

The expected returns from ESG funds are generally lower than those of conventional active and passive funds. Based on the distribution of Jensen's alpha, ESG funds rarely outperform either active or passive funds across most market conditions. Moreover, the management fees charged by ESG funds are not lower than those of existing active or passive funds. As a result, investors are effectively accepting a dual disadvantage: lower returns and higher costs.

Given these findings, it is worth questioning whether ESG funds should be recommended to individual investors or participants in defined contribution pension plans without first presenting clear evidence of their financial viability. The notion that ESG funds can consistently deliver superior long-term returns may, in fact, be more myth than reality. This calls for a more critical and evidence-based discussion on the role and relevance of ESG funds in individual wealth portfolios.

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