



Assessing ESG Impact: Insights from the Hong Kong Fund Market

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ABSTRACT

Hong Kong, a Special Administrative Region of China, has long been a premier international financial hub and is now emerging as a significant center for sustainable finance. This study examines the influence of ESG factors and evaluates ESG policies in Hong Kong's open-end funds market. Findings reveal that ESG funds demonstrating improvements in sustainability status attract more capital flows than conventional funds. Additionally, funds with lower ESG and environmental risks are linked to higher risk-adjusted abnormal returns. These findings highlight the increasing importance of addressing ESG factors, particularly environmental risks in Hong Kong's fund market. Furthermore, evidence suggests that the new ESG circular implemented by the Hong Kong Securities and Futures Commission (SFC) has reduced the overall ESG risk of SFC-authorized ESG funds, indicating the policy's effectiveness in guiding fund managers' investment behaviors.

Keywords: Hong Kong funds, ESG, fund flows, fund performance

JEL classification: G11 G12 G15 G18

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1. Introduction

With rising awareness of environmental, social, and governance (ESG) issues, the global ESG market and sustainable investments have experienced rapid growth. The 2015 Paris Agreement marked a pivotal moment in this trend, accelerating the worldwide momentum towards green finance. In recent years, there have been significant developments in regulatory requirements for ESG and sustainability initiatives. Additionally, the expanding availability of ESG-focused investment opportunities and the growing interest from market participants have motivated extensive research in this field. However, most of the research has concentrated on European or U.S. markets, with other regions receiving considerably less attention regarding their emerging ESG investment activities. To address this gap, this study offers new insights into ESG profiles and the impact of ESG investments by examining the fund market in Hong Kong.

Hong Kong, a Special Administrative Region of China, has consistently been a premier international financial center. The financial industry, a vital component of Hong Kong's economy, offers various financial products. As of 2021, Hong Kong was ranked Asia's top international fund management hub, managing assets worth \$4,558 billion. The region is closely integrated financially with mainland China and is a pivotal link between the mainland and global markets. By 2021, nearly two-thirds of China's inward and outward investments were channeled through Hong Kong.²

Hong Kong is positioning itself as a leading global green and sustainable finance hub. As of September 2023, there are over 200 ESG funds with assets under management of \$159 billion in the Hong Kong market. The Hong Kong Securities and Futures Commission (SFC) plays a vital role in shaping this sector by providing essential guidance on product disclosure and reporting of ESG-related financial products. In 2019, the SFC initiated improvements in disclosure standards for ESG funds by issuing a circular to management companies of SFC-authorized unit trusts and mutual funds. Responding to evolving local and international regulatory landscapes, the SFC issued a new circular in June 2021, superseding the 2019 guidelines. The latest directive requires periodic assessment and enhanced reporting for ESG funds, specifically providing additional guidance for funds focusing on climate-related issues.

Using data from 520 Hong Kong SFC-authorized open-end funds data from January 2020 to December 2023, this study assesses the impact of ESG factors on fund flows and fund performance. It also evaluates how the SFC's updated 2021 ESG circular influenced funds' ESG risk exposure. We used two metrics to gauge ESG factors: the Morningstar sustainability rating and ESG risk scores. Prior research has highlighted a significant relationship between the Morningstar sustainability rating and mutual fund flows (Ammann et al., 2019; Hartzmark and Sussman, 2019). ESG risk scores, including overall and individual E, S, and G pillar scores, measure a fund's exposure to ESG risks and allow for an analysis of the specific impact of each pillar on fund flow and performance.

Our findings indicate a notable difference in how ESG and conventional funds respond to changes in ESG factors regarding fund flows. In particular, ESG funds are more sensitive to changes in sustainability ratings and environmental risks than conventional funds, with flows more positively affected by an improvement in sustainability ratings and more negatively affected by an increase in environmental risk. A positive change in both overall ESG risk and environmental risk adversely impacts fund performance. The analysis highlights that fund investors in the Hong Kong market consider a fund's ESG risk, particularly the environmental risk, in their investment decisions. Therefore, this study identifies the growing importance of addressing climate-related risks in the investment sector in Hong Kong. Furthermore, a difference-in-difference (DID) analysis of the effects of the SFC's new ESG circular revealed a significant decrease in the ESG risk scores of SFC-authorized ESG funds post-implementation, suggesting the effectiveness of the updated policy.

² Statistics retrieved from the Hong Kong Monetary Authority's website: <https://www.hkma.gov.hk/eng>

The literature on mutual funds has extensively explored the impact of ESG factors on various aspects of socially responsible investment (SRI) funds compared to conventional funds, with a focus on fund characteristics, performance, and capital flows (Hamilton et al., 1993, Bauer et al., 2005, Bollen, 2007, Benson and Humphrey, 2008, Renneboog et al., 2011). One strand of the literature has specifically looked into how ESG considerations influence fund attributes, distinguishing between SRI and conventional funds. For example, Ghoul and Karoui (2017) found that funds with higher commitments to corporate social responsibility (CSR) typically underperform compared to those with lower CSR commitments. Similarly, Benson and Humphrey (2008) and Renneboog et al. (2011) noted distinct responses in the capital flows of SRI versus non-SRI funds. These findings highlight the significance of sustainability factors in fund performance and flow analysis. Further research by Heinkel et al. (2001) and Pedersen et al. (2021) has examined the influence of ethical investment strategies on corporate behavior and the effect of ESG factors on the risk-adjusted returns of portfolios.

Another area of focus in the literature is the behavior of fund investors regarding ESG factors, and the varying motivations among different investor groups. For instance, Hong and Kacperczyk (2009) analyzed how pension funds, compared to mutual or hedge funds, are more hesitant to invest in assets with a negative social image. Riedl and Smeets (2017) found that investments in SRI mutual funds are primarily driven by social rather than financial motives. Recent studies, such as Krueger et al. (2020), have found that ESG-focused institutional investors consider climate risk as a significant concern that necessitates effective management. Additionally, Bauer et al. (2021) confirmed that pension fund participants often display strong social preferences in their investment choices.

By examining the impact of a fund's ESG risk on fund flows and fund performance, as well as exploring the impact of the Hong Kong SFC's new enhanced disclosure policy, this study contributes to the literature in the following aspects. First, it extends the geographic scope of ESG research in mutual funds, which has predominantly focused on the U.S. and European markets (Sirri and Tufano, 1998, Del Guercio and Tkac, 2002, Ivković and Weisbenner, 2009), by examining the Hong Kong fund market – an emerging leading center for sustainable finance. Second, the study employs both Morningstar sustainability ratings and ESG risk scores to assess investor response to comprehensive ESG levels as well as to individual ESG pillars. This dual approach provides a nuanced understanding of investor behavior, complementing recent studies that have primarily utilized overall sustainability ratings (Hartzmark and Sussman, 2019; Ammann et al., 2019; Ceccarelli et al. 2024). Third, our findings underscore the critical role of ESG risk and especially the environmental risk in determining fund performance, offering new insights into whether allocating capital to more sustainable assets within a fund's portfolio results in overperformance or underperformance. Lastly, in light of the evolving landscape of ESG-related regulations, there is scant research on how these policies influence fund managers' investment strategies. This study addresses this gap by analyzing the effectiveness of the recent Hong Kong SFC's new circular concerning the ESG fund's disclosure requirement. This analysis provides valuable insights into the regulatory impact on investment practices within the context of ESG factors.

The remainder of this paper is organized as follows: Section 2 introduces the sample selection process and explains the method of constructing key variables. Section 3 presents the regression models, followed by a discussion of the empirical findings. Finally, Section 4 concludes and summarizes the key insights.

2. Data and Methodology

This study examines the fund market in Hong Kong, utilizing monthly data of equity open-end funds authorized by the Hong Kong Securities and Futures Commission (SFC) spanning January 2020 to December 2023. Data for this analysis was sourced from the Morningstar Direct database. Both active and inactive funds are included to avoid survivorship bias. The sample comprises 520 distinct funds distributed across 35 Morningstar global categories. Within the sample, 64 of these funds are SFC-authorized ESG funds, which prioritized environmental, social, and governance factors in their

investment strategies. The sample data includes Hong Kong SFC-authorized funds domiciled in Hong Kong, Ireland, Luxembourg, and the United Kingdom.

Following prior research in the mutual fund literature (Benson and Humphrey, 2008, Ivković and Weisbenner, 2009, Renneboog et al., 2011, Ammann et al., 2019, Hartzmark and Sussman, 2019), this study incorporates a set of widely adopted fund characteristics variables as controls, including total net assets, returns, volatility, fund age, expense ratio, and the Morningstar performance rating. The ESG dimensions of the Hong Kong fund market are assessed using Morningstar’s sustainability rating and ESG risk scores. Morningstar’s sustainability rating assigns 1 to 5 “globes” to funds based on their portfolio’s exposure to environmental, social, and governance risks, with a higher number of globes indicating lower relative ESG risk within a global category. The influence of the Morningstar sustainability rating on fund flows has been investigated in recent studies. It is found that in the mutual fund market, investors increasingly factor sustainability into their investment decisions, directing capital from funds with lower ratings to those with higher sustainability ratings (Ammann et al., 2019, Hartzmark and Sussman, 2019).

In addition to the sustainability rating, we also consider the risk scores for the overall ESG level as well as for the individual pillars of environmental, social, and governance, thereby providing a more detailed analysis of the sustainability characteristics of each fund. In particular, the overall ESG risk score indicates how the economic value of the companies in the fund’s portfolio is vulnerable to risks tied to ESG factors. The environmental, social, and governance risk scores assess the exposure of the fund’s corporate holdings to risks within one of the three ESG pillars (Morningstar, 2021). Each risk score highlights the level of exposure to specific risks, with a lower score suggesting reduced risk exposure and thus being preferable.

Using fund-level total net assets, we estimate fund flows following the approach by Sirri and Tufano (1998). In equation (1), $TNA_{i,t}$ represents the monthly total net assets of fund i , and $R_{i,t}$ denotes the monthly return of the fund.

$$Fund\ Flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}(1 + R_{i,t})}{TNA_{i,t-1}} \quad (1)$$

Fund flows defined in this method represent the percentage net growth in a fund’s total net assets, beyond the growth attributable to fund returns. To reduce the impact of outliers, fund flows are winsorized at the 0.5th and 99.5th percentiles. Hartzmark and Sussman (2019) observe that fund flows can be erratic and are often significantly influenced by various fund attributes. Following their approach, we normalize fund flows by dividing funds into deciles based on size. Within each size decile, fund flows are ranked and assigned percentiles, thus forming the normalized flows.

The fund performance is evaluated using risk-adjusted abnormal returns, measured by alpha. Consistent with prior studies, alpha is estimated using the Carhart four-factor model (Carhart, 1997, Bollen, 2007, Ghoul and Karoui, 2017), as shown below:

$$R_{i,t} - R_{f,t} = \alpha + \beta_{MKT}(R_t^{MKT} - R_{f,t}) + \beta_{SMB}SMB_t + \beta_{HML}HML_t + \beta_{WML}WML_t + \varepsilon_{i,t} \quad (2)$$

In equation (2), $R_{i,t}$ represents the monthly return of funds, and $R_{f,t}$ is the risk-free rate of return, using one-month Hong Kong interbank interest rates sourced from the Hong Kong Monetary Authority website. $R_{MKT,t}$ denotes the market return of Hong Kong, for which we use the return of the Hang Seng Index as a proxy. Additionally, the model incorporates a size factor (SMB_t), a value factor (HML_t), and a momentum factor (WML_t). Data for these factors are retrieved from the publicly accessible online data library provided by Kenneth French.³

Table 1 presents the summary statistics of the main variables, including fund characteristics,

³ Factors’ data for the developed Asia Pacific market are retrieved from the online data library provided by Kenneth French: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

performance rating, sustainability rating, and ESG risk scores. The fund flow (*Flows*) is the growth in a fund's total net assets beyond the growth from fund returns. The normalized flow of funds (*Normalized flows*) is constructed following the method outlined by Hartzmark and Sussman (2019). *Alpha* denotes the alpha estimated using the Carhart four-factor model. *Monthly return*, *prior year's return*, and *prior two years' return* represent fund-level monthly returns, returns over the previous 12 months, and returns over the previous 24 months, respectively. *Volatility* is the volatility of a fund's returns over the previous 12 months. *Size* is measured as the total net assets of a fund in millions of U.S. dollars. *Age* is the number of years since the fund's inception date. *Expense ratio* represents the net expense ratio, which is the percentage of fund assets used to cover operating expenses and management fees. *Performance rating* is a Morningstar metric that measures the financial performance of a fund, while *Sustainability rating* refers to a fund's Morningstar sustainability rating. Both ratings are measured on a scale of 1 to 5, with higher numbers indicating better ratings. The *ESG risk score*, *environmental risk score*, *social risk score*, and *governance risk score* are measured on a scale from 0 to 100. These scores reflect the risk levels of the overall ESG factors and the individual environmental, social, and governance pillars of a fund, where a higher score indicates a higher level of risk.

Table 1. Descriptive Statistics

Variable	N	Mean	SD	Median	Min	Max	P25	P50	P75
Flows (in %)	15,112	-0.33	5.06	-0.44	-24.37	27.25	-1.89	-0.44	0.98
Normalized flows (in %)	15,112	48.32	27.69	48.00	0.00	99.00	25.00	48.00	72.00
Alpha (in %)	15,112	-1.08	1.58	-0.28	-8.64	2.95	-1.95	-0.28	-0.01
Monthly return (in %)	15,112	0.55	6.70	0.79	-56.61	40.86	-3.64	0.79	4.67
Prior year's return (in %)	15,112	6.25	23.76	4.01	-62.12	118.31	-10.62	4.01	20.52
Prior two years' return (in %)	15,112	9.08	29.32	4.96	-70.06	190.60	-11.93	4.96	27.81
Volatility (in %)	15,112	6.16	2.20	5.90	1.09	16.95	4.50	5.90	7.30
Size (in \$m)	15,112	992.87	1,855.47	376.08	1.04	24,226.48	122.43	376.08	1,087.01
Age (in years)	15,112	14.23	8.62	13.25	0.08	49.42	7.50	13.25	18.33
Expense ratio (in %)	15,112	1.88	0.34	1.85	0.17	4.33	1.74	1.85	1.97
Performance rating	15,112	3.19	1.00	3.00	1.00	5.00	3.00	3.00	4.00
Sustainability rating	15,112	3.23	1.07	3.00	1.00	5.00	3.00	3.00	4.00
ESG risk score	15,112	23.35	3.70	23.16	10.81	40.16	21.06	23.16	25.57
Environmental risk score	15,112	4.75	2.18	4.48	0.04	17.47	3.59	4.48	5.35
Social risk score	15,112	8.56	1.92	8.84	0.47	15.11	7.85	8.84	9.78
Governance risk score	15,112	7.24	1.48	7.42	0.50	11.56	6.51	7.42	8.24

Notes: This table presents the descriptive statistics of variables of equity open-end funds of the Hong Kong market. *Flows* is the net flow of a fund, expressed as a percentage of the total net assets. *Normalized Flows* is a standardized measure of fund flows, following the approach described in Hartzmark and Sussman (2019). *Alpha* is the Carhart four-factor model alpha. *Monthly Return* is the fund level monthly return. *Prior year's return* is the fund level return over the prior 12 months. *Prior two years' return* is the fund level return over the prior 24 months. *Volatility* is the volatility calculated from the past 12 months' fund returns. *Size* is the total net assets of a fund expressed in millions of USD. *Age* is the age of a fund, measured by the number of years since inception. *Expense Ratio* is the net expense ratio. *Performance rating* is the Morningstar financial performance rating, on a 1-5 scale. *Sustainability rating* is the Morningstar sustainability rating, on a 1-5 scale. *ESG risk score* measures the fund's overall exposure to ESG risk of component assets. *Environment Risk Score*, *Social Risk Score*

The mean values of the main variables for both the ESG and conventional funds are presented in Table 2. Notably, significant differences are observed in most of these variables. For instance, ESG funds, on average, attract more fund flows than conventional funds over the sample period, yet they exhibit lower alpha. Additionally, ESG funds tend to be larger and younger compared to conventional funds.

Table 2. Univariate Analysis of Fund Characteristics and Sustainability Status

Variables	(1) ESG Fund	(2) Conventional Fund	(1) - (2)
Flows (in %)	0.55	-0.44	0.99***
Normalized flows (in %)	52.87	47.77	5.10***
Alpha (in %)	-1.21	-1.07	-0.15***
Monthly return (in %)	0.74	0.53	0.20
Prior year's return (in %)	9.22	5.89	3.33***
Prior two years' return (in %)	13.72	8.51	5.21***
Volatility (in %)	5.86	6.19	-0.33***
Size (in \$m)	1,109.48	978.60	130.88***
Age (in years)	11.95	14.51	-2.56***
Expense ratio (in %)	1.87	1.88	-0.01*
Performance rating	3.32	3.18	0.14***
Sustainability rating	3.88	3.15	0.73***
ESG risk score	21.16	23.62	-2.47***
Environmental risk score	4.33	4.80	-0.47***
Social risk score	8.23	8.60	-0.37***
Governance risk score	6.82	7.29	-0.47***
Observations	1,648	13,464	

Notes: This table presents the mean values of fund characteristics and sustainability status by sub-groups. The last column presents the t-test result on the significance of the difference between columns (1) and (2). * and *** represent statistical significance at 10% and 1% levels, respectively.

3. Empirical Analysis

3.1 Fund Flow and ESG

If investors integrate sustainability into their investment decision-making process, a link between ESG factors and fund flows is expected. To explore this anticipated connection, we employ a model that controls for both the fund investment style and the month fixed effect. Additionally, standard errors are clustered at the fund level.

$$Flow_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \theta Controls + \varepsilon_{i,t} \quad (3)$$

In equation (3), $Flow_{i,t}$ represents the fund flow, while $ESG_{i,t}$ denotes the sustainability variable, which can be either the Morningstar sustainability rating or ESG risk score.⁴ Ceccarelli et al. (2024) suggest that changes in ratings, rather than their absolute levels, exert a greater influence once investors have already aligned themselves with funds of varying sustainability levels. To address this consideration, our analysis considers both the level and changes in ESG factors. *Controls* encompasses a set of control variables, including the Morningstar performance rating lagged by one month, the fund-level monthly return also lagged by one month, returns over the prior 12 and 24 months, fund size (expressed as the logarithm of total net assets) lagged by one month, the number of years since the fund's inception (fund age), volatility calculated from the past 12 months' returns, and the expense ratio, which reflects the proportion of the fund's holdings bought or sold over a year.

The baseline model results are summarized in Table 3. Specifically, Panel A presents results using the absolute levels of sustainability ratings and ESG risk scores as the ESG factor. Panel B reports results based on changes in ratings or ESG risk scores. Within each panel, columns (1)-(5) correspond to the results using the original fund flows as the dependent variable, while columns (6)-(10) report results with

⁴ As a robustness check, in the fund flow analysis in section 3.1 and the fund performance analysis in section 3.2, we employed regression models that incorporate the one-month lagged terms of the Morningstar sustainability rating and ESG risk scores. The findings remain consistent.

normalized fund flows. Notably, in the baseline analysis, there is no significant relationship between the absolute levels of various ESG factors and fund flows. However, when changes in ESG factors are considered, there is weak evidence suggesting a linkage between changes in ESG risk scores and fund flows.

Table 3. Fund Flow and Sustainability: Baseline Regressions

Panel A: Fund Flow in Response to Level of Sustainability and ESG Risk Scores										
Dependent variable:	Flows					Normalized flows				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sustainability rating	-0.11 (-1.55)					-0.49 (-1.14)				
ESG risk		0.03 (0.71)					0.15 (0.69)			
Environmental risk			0.02 (0.28)					0.32 (0.90)		
Social risk				-0.01 (-0.25)					0.16 (0.51)	
Governance risk					-0.06 (-1.08)					-0.11 (-0.30)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Style fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Observations	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112
Panel B: Fund Flow in Response to Change in Sustainability and ESG Risk Scores										
Dependent variable:	Flows					Normalized flows				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Δ Sustainability rating	0.20 (1.07)					0.95 (1.00)				
Δ ESG risk		-0.22* (-1.94)					-0.80 (-1.31)			
Δ Environmental risk			-0.13 (-0.69)					-0.91 (-0.83)		
Δ Social risk				0.45* (1.90)					1.68 (1.53)	
Δ Governance risk					0.52 (1.64)					1.51 (0.99)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Style FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Observations	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112

Notes: The table shows the regression results of fund flows on sustainability variables. Panel A uses level data of sustainability rating and ESG risk scores, and Panel B uses the change in these variables. Control variables include the one-month lagged Morningstar performance rating, one-month lagged fund's monthly return, return in the prior year, return in the prior two years, the log of fund's total net assets in the prior month, fund's age in the number of years, volatility estimated from prior 12 months' returns, and the expense ratio. All regressions include investment style and month fixed effects. Standard errors are clustered by fund, and t-statistic in parentheses. * indicates significance at the 10% levels.

Next, we investigate whether the relationship between fund flows and ESG factors varies between ESG funds and conventional funds. To this end, we have incorporated an ESG fund dummy variable and an interaction term between sustainability factors and the ESG fund dummy into equation (3). The ESG

fund dummy is assigned a value of one for ESG funds, and zero for conventional funds. After adding these variables, the model is re-estimated, and the results are presented in Table 4. When using original fund flows as the dependent variable, we observe that compared to conventional funds, the flows of ESG funds respond more positively to improvements in sustainability ratings and more negatively to positive changes in environmental risk score. When normalized fund flows are used as the dependent variable, the changes in sustainability rating, ESG risk, and environmental risk are all significant factors. These findings indicate that changes in a fund’s sustainability status prompt investors in the Hong Kong open-end fund market to adjust their capital allocations. Furthermore, investors are particularly responsive to environmental risk, which is more climate related than other ESG risk pillars.

3.2 Fund Performance and ESG

We further investigate the relationship between fund performance and ESG factors using the following regression model:

$$Alpha_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \theta Controls + \varepsilon_{i,t} \quad (4)$$

In equation (4), the dependent variable is fund performance, quantified by the Carhart four-factor model’s alpha. The variable $ESG_{i,t}$ represents sustainability, measured either by the Morningstar sustainability rating or the ESG risk score. Control variables in our analysis include fund flows lagged by one month, fund size (expressed as the logarithm of total net assets) lagged by one month, fund age, volatility calculated from the past 12 months’ returns, and the expense ratio. The model controls for both the fund’s investment style and month fixed effects. Standard errors are clustered at the fund level.

We first conduct the baseline analysis, with the results presented in Table 5. The findings provide strong evidence that the alpha of funds is negatively affected by both overall ESG risk and environmental risk. To investigate whether the significantly negative relationship between fund performance and ESG risk factors differs between ESG funds and conventional funds, we include the ESG fund dummy variable and an interaction term between sustainability factors and the ESG fund dummy into equation (4). As shown in Table 6, we do not find any significant difference in the performance-ESG risk relationship between ESG funds and conventional funds.

Table 4. Fund Flow and Sustainability: ESG vs. Conventional Funds

Dependent variable:	Flows					Normalized flows				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ΔSustainability rating × ESG fund dummy	1.61** (2.46)					7.07** (2.26)				
ΔESG risk × ESG fund dummy		-0.94 (-1.37)					-10.01*** (-4.03)			
ΔEnvironmental risk × ESG fund dummy			-1.52** (-2.11)					-13.18*** (-3.73)		
ΔSocial risk × ESG fund dummy				-0.74 (-0.71)					-5.17 (-1.39)	
ΔGovernance risk × ESG fund dummy					-0.38 (-0.24)					1.90 (0.41)
ΔSustainability rating	0.04 (0.18)					0.23 (0.23)				
ΔESG risk		-0.15 (-1.42)					-0.08 (-0.12)			
ΔEnvironmental risk			-0.03 (-0.15)					-0.02 (-0.01)		
ΔSocial risk				0.52** (2.20)					2.18* (1.87)	
ΔGovernance risk					0.55* (1.77)					1.34 (0.83)
ESG fund dummy	0.66** (2.26)	0.60** (2.05)	0.67** (2.26)	0.65** (2.28)	0.67** (2.34)	3.00* (1.96)	2.28 (1.50)	2.97* (1.93)	2.89* (1.91)	3.09** (2.03)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Style FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Observations	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112	15,112

Notes: The table shows the regression results after incorporating ESG fund dummy variable and an interaction term to the baseline model. Control variables include the one-month lagged Morningstar performance rating, one-month lagged fund's monthly return, return in the prior year, return in the prior two years, the log of fund's total net assets in the prior month, fund's age in the number of years, volatility estimated from prior 12 months' returns, and the expense ratio. All regressions include investment style and month fixed effects. Standard errors are clustered by fund, and t -statistic in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Fund Performance and Sustainability: Baseline Regressions

Dependent variable:	Alpha				
	(1)	(2)	(3)	(4)	(5)
Sustainability rating	0.01 (0.90)				
ESG risk		-0.01** (-2.06)			
Environmental risk			-0.02** (-2.37)		
Social risk				0.02* (1.94)	
Governance risk					0.01* (1.66)
Other controls	Yes	Yes	Yes	Yes	Yes
Style FE	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.08	0.08	0.08	0.08	0.08
Observations	15,112	15,112	15,112	15,112	15,112

Notes: The table shows the regression results of fund's performance on sustainability variables. Control variables include the one-month lagged fund flow, the log of the fund's total net assets in the prior month, the fund's age in the number of years, volatility estimated from prior 12 months' returns, and the expense ratio. All regressions include investment style and month fixed effects. Standard errors are clustered by fund, and t-statistic in parentheses. * and ** indicate significance at the 10% and 5% levels, respectively.

Table 6. Fund Performance and Sustainability: ESG vs. Conventional Funds

Dependent variable:	Alpha				
	(1)	(2)	(3)	(4)	(5)
Sustainability rating × ESG fund dummy	-0.01 (-0.52)				
ESG risk × ESG fund dummy		0.01 (0.92)			
Environmental risk × ESG fund dummy			-0.01 (-0.22)		
Social risk × ESG fund dummy				-0.01 (-0.25)	
Governance risk × ESG fund dummy					-0.01 (-0.47)
Sustainability rating	0.01 (0.97)				
ESG risk		-0.01** (-2.17)			
Environmental risk			-0.02** (-2.25)		
Social risk				0.02** (2.00)	
Governance risk					0.02* (1.71)
ESG fund dummy	0.04 (0.47)	-0.22 (-1.04)	0.02 (0.19)	0.05 (0.31)	0.08 (0.50)
Other controls	Yes	Yes	Yes	Yes	Yes
Style FE	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.08	0.08	0.08	0.08	0.08
Observations	15,112	15,112	15,112	15,112	15,112

Notes: The table shows the regression results after incorporating ESG fund dummy variable and an interaction term to the baseline model. Control variables include the one-month lagged fund flow, the log of the fund's total net assets in the prior month, the fund's age in the number of years, volatility estimated from prior 12 months' returns, and the expense ratio. All

regressions include investment style and month fixed effects. Standard errors are clustered by fund, and t-statistic in parentheses. * and ** indicate significance at the 10% and 5% levels, respectively.

These findings align with the “doing well while doing good” hypothesis proposed by Hamilton et al. (1993). According to this hypothesis, funds that invest heavily in companies with poorly managed ESG or environmental risks often fail to anticipate the emergence of negative information about these companies. Consequently, adverse news will lead to declining stock prices and reduced abnormal returns for portfolios holding these stocks. Furthermore, Pástor et al. (2021) developed an equilibrium model of sustainable investing, suggesting that investors with positive ESG preferences derive utility from holding green assets. These investors are willing to pay premium prices for green stocks. Our findings on the negative ESG risk-performance relationship suggest that, for open-end funds in the Hong Kong market, incorporating assets from companies with robust ESG, particularly environmental, risk management into the portfolio is associated with superior financial performance.

3.3 The Impact of Hong Kong SFC’s New Circular on the ESG Risk

In June 2021, the Hong Kong SFC issued a new “Circular to management companies of SFC-authorized unit trusts and mutual funds – ESG funds,” which superseded the “2019 Circular”. The updated disclosure guidelines take into account recent developments in global ESG regulatory frameworks. For example, the European Commission’s Sustainable Finance Disclosure Regulation (SFDR), implemented in March 2021, mandates that financial market participants and advisors disclose ESG-related information. The SFDR is designed to assist investors in making well-informed decisions by providing clarity on how sustainability risks are considered during the investment decision-making process. In the Hong Kong market, the implementation of the SFC’s 2021 Circular is anticipated to elevate the disclosure standards of ESG funds, enhancing their comparability, transparency, and visibility. For instance, the latest circular provides more detailed instructions on periodic assessment and reporting for ESG funds, as well as additional guidance for funds focusing on climate-related issues.⁵ The new circular took effect on January 1st, 2022. Should this policy prove effective, we anticipate a decrease in ESG risk for ESG funds relative to conventional funds, assuming fund managers adopt a more cautious and stringent approach to asset selection in their portfolios to better comply with the new requirements.

Figure 1 visually illustrates the evolution of the average ESG risk scores of funds from May 2021 to December 2022. Before the policy’s effective date, the average ESG risk scores of ESG and conventional funds appeared parallel. Immediately following the effective date, there was a notable and sharp decline in the ESG risk scores of ESG funds, while the scores for conventional funds remained mostly unaffected.

⁵ Information retrieved from the Hong Kong SFC’s website: <https://www.sfc.hk/en/>

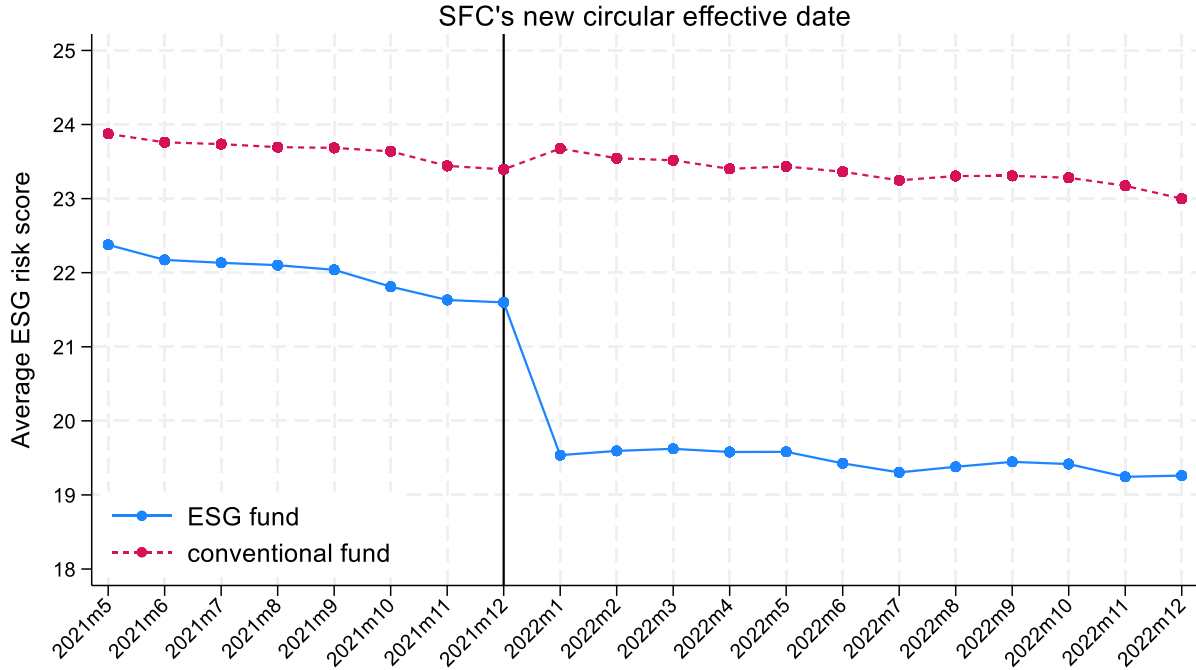


Figure 1. Average ESG risk scores of ESG funds and conventional funds, May 2021 to December 2022.

This figure presents the evolution of ESG and conventional funds’ average ESG risk scores around the effective date (January 1st, 2022) of Hong Kong SFC’s new circular. The time label represents the end of each month.

To formally assess the impact of this policy on the ESG risk of these funds, we applied a difference-in-differences (DID) regression model that controls for both the fund’s investment style and month fixed effects.⁶ Standard errors are clustered at the fund level.

$$ESG Risk_{i,t} = \beta_0 + \beta_1 ESG dummy_i \times Post_t + \beta_2 ESG dummy_i + \theta Controls + \varepsilon_{i,t} \quad (5)$$

In equation (5), the dependent variable $ESG Risk_{i,t}$ represents the ESG risk score of a fund. The variable $ESG dummy_i$ is the dummy variable assigned a value of 1 for ESG funds and 0 for conventional funds. The variable $Post_t$ is another dummy variable, set to 1 for sample observations after the effective date (January 1st, 2022) of the new circular. The term $Controls$ refers to a vector of control variables, which includes fund flows lagged by one month, the Carhart four-factor model’s alpha lagged by one month, monthly fund returns lagged by one month, fund size as indicated by the logarithm of total net assets lagged by one month, the fund age, volatility calculated from the past 12 months’ returns, and the expense ratio. The interaction term $ESG dummy_i \times Post_t$ serves as the DID estimator, and its coefficient β_1 measures the impact of the Hong Kong SFC’s new enhanced disclosure requirement on the ESG risk exposure of SFC authorized ESG funds.

The estimation results of the DID model are reported in Table 7. The analysis covers the period from May 2021 to December 2022, with the results for the full sample data presented in columns (1) and (2). Column (1) presents results without the control variables, while column (2) includes all control variables. We observe that the estimated coefficient of the DID estimator is significantly negative, indicating that the new circular has likely driven a reduction in the ESG risk levels of ESG funds. The findings suggest

⁶ To evaluate the suitability of using the DID approach, we conducted the parallel trend test. The findings of the test confirm that the treatment group (ESG funds) and control group (conventional funds) exhibited parallel trends in their ESG risk scores prior to the implementation of the new circular.

that to comply with the more stringent requirements outlined in the 2021 Circular, fund managers may reallocate capital towards more sustainable assets, thereby reducing the ESG risk exposure of their portfolios.

Table 7. ESG Risk and Hong Kong SFC's New Circular

Dependent Variable: Sample:	ESG risk			
	Full Sample		Matched Sample	
	(1)	(2)	(3)	(4)
ESG fund dummy × Post	-1.03*** (-2.83)	-1.11*** (-3.10)	-1.18** (-2.19)	-1.12** (-2.07)
ESG fund dummy	-1.05*** (-2.96)	-1.04*** (-3.17)	-0.39 (-0.80)	-0.43 (-0.98)
Other controls	No	Yes	No	Yes
Style FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Adj. R^2	0.07	0.10	0.11	0.19
Observations	5,639	5,639	859	859

Note: The table presents results of the difference-in-difference (DID) analysis on the impact of Hong Kong SFC's new circular, effective as of January 1st, 2022. Sample period is May 2021 to December 2022. Columns (1) and (2) present results using the full sample data. In the matched sample analysis of columns (3) and (4), a group of matched conventional funds is constructed using 1:1 nearest neighbor matching method based on flows, size, fund age, previous year's return, and the Morningstar performance rating. Control variables include flows in the prior month, one-month lagged Carhart four-factor alpha, one-month lagged fund's monthly return, the logarithm of fund's total net assets in the prior month, fund age in number of years, volatility estimated from the previous 12 months' returns, and the expense ratio. All columns include investment style and month fixed effects. Standard errors are clustered by fund, and t-statistic in parentheses. ** and *** indicate significance at the 5% and 1% levels, respectively.

To further mitigate potential differences between ESG and conventional funds due to various fund characteristics, we created a matched sample. Using a 1:1 nearest neighbor propensity score matching method, each ESG fund was paired with a conventional fund based on fund flows, size, age, previous year's return, and the Morningstar performance rating. We excluded any matched pair from the sample if the difference in their propensity scores exceeded 0.025. Funds were initially matched based on these criteria as of December 2021, and the matched sample was consistently used for each month in the sample period (May 2021 to December 2022). Using the refined sample, we re-estimate the DID regression model and present the results in columns (3) and (4). In both columns, the estimated coefficient of the DID interaction term remains significantly negative. Therefore, after matching, the analysis still confirms that the implementation of the new circular has effectively lowered the ESG risk for ESG funds in the Hong Kong market.

4. Conclusions

This study examines the impact of ESG factors on fund flows and fund performance in the Hong Kong open-end fund market. The ESG factors analyzed include the Morningstar sustainability rating and both the overall ESG and individual ESG pillar risk scores of a fund. Additionally, this study investigates the effects of implementing the Hong Kong SFC's new circular on the overall ESG risk of SFC-authorized ESG funds.

Our findings indicate that fund flows of ESG funds in the Hong Kong market are more significantly influenced by changes in ESG factors compared to conventional funds. Specifically, the flows of ESG funds are more positively associated with improvements in sustainability ratings and more negatively associated with increases in environmental risk. The implication is that investors of the ESG funds actively monitor changes in the ESG profiles of these funds, directing their capital toward funds that demonstrate a more sustainable portfolio of assets or lower exposure to environmental risk.

The study also reveals that ESG factors significantly impact fund performance. The baseline analysis discovers that, for all funds in the sample, both overall ESG risk and environmental risk negatively affect the alpha of funds. There appears to be no significant difference in the relationship between performance and ESG factors when comparing ESG and conventional funds.

Additionally, this study employs DID analysis to evaluate the impact of the Hong Kong SFC's new enhanced disclosure guidelines on the overall ESG risk of ESG funds. Results from both the full sample and matched sample analyses confirm that, following the implementation of the new circular, the ESG risk scores of SFC-authorized ESG funds have significantly decreased. Consequently, the enhanced transparency and more stringent periodic assessment requirements introduced by the new circular appear to have played a crucial role in shaping fund managers' investment behavior and enhancing investors' understanding and evaluation of funds' sustainable features.

Overall, the significant relationships between fund flows, performance, and ESG indicators suggest that investors in the Hong Kong market consider a fund's exposure to ESG risks when making investment decisions. This highlights the importance of integrating sustainability into portfolio formation, especially for funds marketed as ESG-focused. Notably, investors prioritize environmental risks over social or governance concerns. By confirming the effectiveness of the new ESG circular implemented by the Hong Kong SFC, this study's findings suggest that it is crucial for regulatory bodies to continuously monitor and adapt to evolving trends in sustainability integration within the investment industry.

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