# MUTUAL FUND PERFORMANCE IN A BULLISH MARKET DURING THE COVID-19 CRISIS

**[1]Yunqi Chen & [2]Jia Sin Lim**
[1]Faculty of Economics and Business,
Katholieke Universiteit Leuven, Belgium
[2]Corporate Recovery and Restructuring
Baker Tilly International, Malaysia

*[2]Corresponding author: jiasin6099@gmail.com*

## ABSTRACT

Active funds vs passive funds represent one of the most prominent investment decisions that ought to be undertaken by investors over the decades. Our paper seeks to offer an insight into the average performance of equity mutual funds during the period when there were roughly 70 'all-time-highs' recorded by S&P 500 amid the COVID-19 health crisis. Additionally, our paper aims to explore the robustness and persistence of the explanatory powers of Morningstar sustainability globes, ratings from agencies and growth tilt during the health crisis. Our results indicated that the benchmark indexes seemed to dominate mutual funds in most cases during our sampling period. The ratings from Morningstar and/or Lipper together with growth investing appeared to be ideal elements to contemplate when making investment decisions during the COVID-19 health crisis.

## INTRODUCTION

The performance of active funds and passive funds has been a never-ending controversial debate in the finance world, with no definite conclusion in sight. The vast majority of studies have discovered that mutual funds underperform index funds (Carhart, 1997; Jensen, 1968; Pastor & Stambaugh, 2000; Wermers, 2000), and there are inevitably opposing opinions cast by other scholars that uphold the benefits of mutual funds (Grinblatt & Titman, 1993; Kosowski, 2011; Moskowitz, 2000). In the view of how active fund managers benefit from price dislocation amid a volatile period, active funds are expected to overtake benchmarks during market crisis (Chevalier & Ellison, 1999) and should act as a hedge against market downside risk (Moskowitz, 2000). Besides, a recent study by Pastor and Vorsatz (2020) explored the performance of mutual funds during the COVID-19 crisis. It comes as no surprise that most active funds underperformed passive benchmarks during the market crash period, while sustainability ratings, Morningstar ratings as well as growth funds (growth tilt) had robust explanatory power during the crisis.

Socially responsible investing (SRI) has captivated financial investors to address both responsibility concerns and capital gain goals throughout the recent decade. Previous studies have noted that the investment preference for SRI may be driven by non-pecuniary concerns, though it could also act as a predictor for future returns (Hartzmark & Sussman, 2019). Remarkably, there was outperformance generated by sustainable funds during the recessions (Albuquerque et al., 2020; Nofsinger & Varma, 2014), with large portions of excess returns contributed by the environmental (E) element (Ferriani & Natoli, 2021; Pastor & Vorsatz, 2020). In spite of the fact, many studies have provided insights on the persistence of fund performance and concluded that poor performance could be easily predicted, whereas foreseeing superior performance is challenging. For example, Blake and Morey (2000) stated that the Morningstar ratings could be an indicator to distinguish poor performing funds but not a crystal ball on well performing funds.

Pastor and Vorsatz (2020) found that growth funds (growth tilt) outshone value funds during the COVID–19 health crisis which contradicted the fundamental finance belief that advocates value investing. Value premium is taken as compensation for investors to undertake additional distress risk fuelled by low profitability offered by value firms (Fama & French, 1996) and the potentially poor performance amid market downturns due to the business inflexibility of value firms compared to its glamour counterpart (Petkova & Zhang, 2005). No doubt, the opposing team also stated that value equities outcompeted glamour equities due to investors' overconfidence in future growth rate, profitability, and cash flow of growth (glamour) stocks (Lakonishok et al., 1994).

In the beginning of 2020, S&P 500 lost almost 40 percent of its value in five weeks due to the fear and anxiety of investors stoked by the rapid spread of the COVID-19 virus. However, in 2021, the U.S. market triumphed with the S&P 500 notching around 70 'all-time highs', the second-highest annual tally in history. Previous studies are limited to time horizons. As far as we are concerned, few studies attempted to examine the determinants of fund performance during the boom period of the COVID-19 crisis. Given that active fund managers are well equipped with sophisticated equities selection skills coupled with perfect knowledge of the intrinsic value of assets, the active fund managers were expected to reap the alpha from the acute market crash in February 2020 and thus generated better performance during the market boom. Hence, we are interested in learning about mutual fund performance during the market boom between April 2020 and December 2021. This horizon is up to date, and therefore, the results would supersede the results from previous studies. By combining our sampling period with Pastor and Vorsatz's time horizon, investors will secure a deeper insight into the fund performance as this study consists of a complete cycle (precrisis-crash-recovery-boom) analysis on the fund performance during the COVID-19 pandemic.

This paper aims to further investigate the fund performance and its determinants, following a previous study by Pastor and Vorsatz (2020). By looking into how rapidly the market had recovered from the tremendous chaos stoked by investors' fear, we attempt to answer the following three questions. First, could active funds exploit the price dislocation advantage during the crash period to outclass the benchmarks in the midst of the market boom? Second, do sustainability ratings and Morningstar ratings hold the same explanatory power as

they do during the market crash? Last, could growth funds deliver an excess return compared to its value counterpart during the market boom? We think that these questions have a significant influence on retail investors' investment decisions.

We began first by estimating the funds' alpha using the multifactor models with a sample of approximately 3,430 equity funds and 2 benchmarks. Our results were somewhat similar to the results of, Pastor and Vorsatz (2020) with the active funds underperforming the benchmarks in most cases. To further examine the relationship between funds' return and sustainability, risk rating, and growth tilt (growth fund), we employed Pastor and Vorsatz's model for both benchmark-adjusted and factor-adjusted returns. In addition to the original indicators, we introduced the Lipper preservation rating to assess funds' ability to preserve their capital in the unpredictable market and of course to test the explanatory power of ratings awarded by different rating agencies. The evidence highlights the potential role of ratings awarded by rating agencies and growth tilt in investment decisions as the results hold after incorporating three levels of controls and are robust after replacing different determinants.

The contribution of our study can be distilled into three points. Firstly, we proved that part of Pastor and Vorsatz's (2020) results can be generalized to other time horizons during the health crisis. Nevertheless, our results indicated that the sustainability rating does not assert strong predictability power on fund performance. Moreover, fund ratings' explanatory power remained strong during the market boom period, which indicated the importance of ratings in predicting funds' return during the health crisis. Lastly, we offer an alternative perspective on the capability of growth investing to generate excess benchmark-adjusted return during the COVID-19 health crisis bullish market. The follow part of this paper consists of the second section— the literature review while the third section examines the data and methodology. The fourth section discusses the results and the last section states our conclusion.

## LITERATURE REVIEW

Mutual fund performance has been extensively studied since the 1950s but evaluated primarily on net value change before the 1960s which

fails to consider whether taken market risk is well compensated with desirable returns. The Modern Portfolio Theory (MPT) by Markowitz (1952) played a prominent role in developing modern investment theory, whereby Tobin (1958) included risk-free assets into the framework and proposed a two-fund separation theorem to further enhance the MPT. Later, Treynor (1961), Sharpe (1964), Lintner (1965) and Mossin (1966) introduced Capital Asset Pricing Model (CAPM) by building on the earlier work of Markowitz on MPT to gauge the relationship between systematic risk and returns on assets. The risk-adjusted performance evaluation method has been widely applied ever since. Treynor (1965) first introduced the MPT into the field of fund performance evaluation. Thus, the Treynor index has been utilized to measure risk-adjusted performance of an investment portfolio by analyzing a portfolio's excess return per unit of systematic risk. Specifically, the Treynor index holds that idiosyncratic risks can be eliminated through diversifying portfolio investment. Numerous theories on fund performance evaluation have been proposed after that and are still in use today, namely the Sharpe ratio (1966), Jensen's Alpha (1968) and other measurements. In view of the limitations of the CAPM-based one-factor model, some researchers have proposed different multi-factor models to include multiple risk factors. For example, Fama and French (1993) added the size of firms (SMB) and book-to-market values (HML) to the traditional CAPM model, formally introducing the well-known three-factor model. Carhart (1997) then supplemented the momentum factor to the three-factor, which further improved the explanatory power by a large magnitude compared to the CAPM model.

A much-debated question is whether active funds outperform passive funds since management fees or other costs are incurred on active funds. Jensen (1968) evaluated the performance of 115 open-end mutual funds between the period, 1945 and 1964 using Jensen's alpha, and found that active funds underperformed the buy-the-market-and-hold policy, either, individually or in aggregate. Additionally, Carhart (1997) summarized that load funds substantially underperformed no-load funds by approximately 80 basis points per year when examining fund performance using the CAPM, 3-factor, and 4-factor models. Pastor and Stambaugh 2000 determined that most of the funds underperformed the CAPM and Fama-French benchmarks by applying a sample of 2,609 U.S. equity mutual funds from 1963 to 1998. Besides, Bogle (2002) empirically demonstrated that the average returns of the active sample funds were significantly overstated after

studying the performance of funds in the same style box from 1991 to 2001. Furthermore, Pastor and Vorsatz (2020) concluded that active funds underperformed passive benchmarks during the COVID-19 crisis after analyzing a sample of 3,626 U.S. active equity mutual funds by applying the CAPM and other multi-factor models. With the various performance measures, these studies arrived at the same conclusion whereby actively managed funds often underperform passively managed funds in many aspects.

Investors' appetite consistently grows for active funds despite the underperformance of mutual funds. Such a phenomenon is somehow puzzling as investors are willing to tolerate this underperformance because active funds will outperform passive funds in certain aspects. A study by Grinblatt et al. (1995) has revealed that funds invested in momentum have significantly better performance than other funds. Grinblatt and Titman (1989) concluded that mutual fund managers can pick stocks that outperform their benchmarks before deducting any expenses. The evidence is strong among growth funds, which hold stocks that outperform their benchmarks by around 3 percent per year before deducting expenses. However, investors cannot achieve abnormal returns by purchasing talented managers' funds because these funds typically incur the highest expenses. A paper published by Wermers (2000) has also shown that fund managers' superior ability in stock selection does have a significant contribution towards beating the market index by documenting that mutual funds consist of stock portfolios that outperform a broad market index by 1.3 percent.

Notwithstanding the above, sustainable investing, which involves the E (environmental), S (social), and G (governance-related), has also gained traction in the asset management industry despite traditional investing that only emphasizes risk-adjusted returns. Lins et al. (2017) presented a model to examine the performance of non-financial U.S. firms during the financial crisis of 2008–2009. The firms with high corporate social responsibility tended to outperform the others during the crisis period. Furthermore, Hartzmark and Sussman (2019) concluded that investors in the U.S. value sustainability ratings when making investment decisions but sustainable investing is often associated with environmental-related issues. Moreover, Pastor and Vorsatz (2020) revealed that mutual funds with higher E ratings seemed to excel during the COVID-19 crisis. In contrast, both S and G did not seem to have much noticeable impact on mutual fund

performance. Ferriani and Natoli (2021) also found that sustainable investing could be considered a perfect hedge during the crisis, especially the COVID-19 crisis. Investors with average or higher ESG preferences are inclined to allocate more funds to green firms instead of the market portfolio (Pastor et al., 2021). This could be because investors with high ESG preferences are more resilient and loyal to holding green portfolios than other investors (Albuquerque et al., 2019). Nonetheless, it is assured that sustainable investing breeds positive social impact by directing more capital towards green firms and pushing brown firms to be greener (Pastor et al., 2021).

Although mutual funds with high sustainability ratings outperformed the others during the economic turmoil, such outperformance is at the cost of inferior performance during bullish times (Nofsinger & Varma, 2014). Lesser et al. (2016) further elaborated that the outperformance of mutual funds with high sustainability ratings is merely driven by the skills of active fund managers and not solely due to sustainability ratings. It is also observed that there is no outperformance in terms of mean returns and volatility for sustainable funds when applying the Fama-French three-factor model. However, the top quintile sustainability portfolio in Europe seems to yield a better alpha in comparison with the rest mainly due to the higher social and governance scores (Steen et al., 2020).

In contrast to the Morningstar sustainability globe rating, the Morningstar rating is one of the commonly used risk-adjusted return measurements. It is considered an essential indicator for fund performance in a prospective way. Blake and Morey (2000) examined the predictive power of the Morningstar rating system over time including fund investment styles, and fund ages. They found that the predictive power is most robust for low rating funds (less than 3 stars), while statistical evidence for highest-rated funds outperforming the four-rated and three-rated funds is weak. Such funding is aligned with previous studies for mutual fund performance persistence—poorer performance is easy to predict, while superior performance is rugged. The value anomaly is a much-debated topic in the financial industry where the outperformance of value portfolios is considered as compensation for an investor to bear the distress risk since the high book-to-market (value) often features persistent low profitability and vice versa for the low book-to-market (Fama & French, 1996). Additionally, value portfolios underperform growth portfolios in a

shorter investment horizon coupled with higher risk during bad times or recession (Lettau & Ludvigson, 2001; Petkova & Zhang, 2005). Zhang (2005) further elaborated that higher risk captured by value stocks during bad times is possibly due to business inflexibility. For instance, value firms find it more challenging to disinvest and redistribute their capital for efficient productivity allotment during bad times since most of their capital are tangible assets. On the other hand, Lakonishok et al. (1994) argued that value stocks outperform glamour stocks because the market often overestimates the future growth rate and cash flow of glamour stocks. In other words, the outperformance of value firms is attributed to their outstanding cash flow and actual growth rate but not the additional fundamental risks involved.

## RESEARCH METHODOLOGY

### Data

We sourced our data primarily from the Center for Research in Security Prices (CRSP) – Mutual Funds, Eikon Refinitive and Yahoo Finance. Our aim was to investigate mutual fund performance during the market boom from April 2020 to December 2021 especially when the S&P 500 reached approximately 70 times 'all-time high' in 2021 in the midst of the massive surge in COVID–19 cases due to the emergence of the Delta variant. Thus, our primary sampling period was from 03 April 2020 to 31 December 2021 whereby there was a bounce-back in the S&P 500 index in early April 2020 after the market crash in February 2020.

First, we extracted all funds with a fund summary from the CRSP. All non–equity funds were excluded from our sampling based on the Lipper Asset Code available in the 'Fund Summary' of CRSP. Furthermore, we removed funds that did not have an 'X' at the end of their NASDAQ tickers since NASDAQ tickers ending with an 'X' are categorized as mutual funds. In other words, all funds that did not have NASDAQ tickers were excluded from our data sampling given that NASDAQ tickers were vital in our data collection process. Next, we proceeded to remove all funds with names consisting of 'bond', 'money market', 'retirement', 'index' and 'fixed income'. Besides, index funds were excluded from our sample based on the

index fund indicator in the 'fund summary' of CRSP. A fund size filter was also applied in our sampling process with funds that had at least $15 million in total net asset (TNA) included in our primary sample data. In addition to that, all funds from different classes were excluded from our sample data according to the identical CRSP class group code (CRSP CL Group) in the 'Fund Summary' of CRSP. We opted to remove funds with smaller TNA when dealing with funds that contained the same CRSP class group code. Eventually, there were approximately 3,400 mutual funds and 2 benchmarks in our primary data.

This paper also attempts to examine the impact of growth funds (growth tilt) or funds with high Morningstar sustainability globe, Lipper preservation rating, and Morningstar risk rating on the benchmark adjusted performance or even alpha during market boom in the midst of the COVID–19 crisis. The fund-level control embodied in the model consisted of the institutional fund indicator, value fund indicator, small-cap fund indicator, large-cap fund indicator, funds' age as of March 2020, expense ratio, funds' TNA as of March 2020, number of dividend payments, dividend payments, equity positions and funds' turnover ratio. In addition, the country-level control augmented represented the funds' percentage of the TNA in North America, the United Kingdom, Continental Europe and Asia, coupled with the international funds identified in the 'Lipper Objective' of CRSP. Finally, the industry-level control encompassed TNA funds percentage in basic materials, communication services, consumer cyclical, consumer defensive, energy, financial services, health care, industrials, real estate, technology and utilities along with industry funds spotted in the 'Lipper Objective' of CRSP.

The Morningstar sustainability rating is a rating using environmental, social, and governance (ESG) factors whereby 1 globe indicates that the fund has a low ESG rating while 5 globes denote that the fund has a high ESG rating. The E, S, and G risk scores are acquired to measure funds' exposure to ESG risks in the sense that the higher the score, the higher the risk. Based on ESG risk scores, we transformed them into ESG sustainability, following the formula by Pastor and Vorsatz (2020). We replaced the original risk scores by taking the natural logarithm and multiplying it by the negative one. The following formula indicates that the higher the fund sustainability (transformed risk score), the more sustainable the fund.

$$E \rightarrow -1*log(E); S \rightarrow -1*log(S); G \rightarrow -1*log(G) \qquad (1)$$

Other than that, the Morningstar risk rating is awarded to mutual funds based on downside losses/variations compared to its peers in the same category, which is also a key component of Morningstar's risk-adjusted returns (MRAR) at the same time. A 1-star rating signals the lowest risk while a 5-star rating indicates the highest downside volatility of the fund over the past 3, 5, and 10 years. The Morningstar sustainability globe, Morningstar risk rating and funds' turnover ratio, environmental scores, social scores, and governance scores of mutual funds were obtained from Yahoo Finance by executing automated web-scraping. Additionally, the growth or value fund, small-cap or large-cap fund indicators were retrieved from the 'Lipper Classification' of 'Fund Summary' in CRSP. Finally, the expense ratio, number of dividend payments, dividend payments, Lipper preservation rating, and percentage of TNAs in numerous sectors and countries of mutual funds were extracted from the Eikon Refinitive. The correlation and descriptive summary for independent variables are as follows.

**Table 1**

*Correlation Matrix of Variables*

| Variable | Morningstar Sus Globe | Morningstar Risk Rating | Lipper Preservation Rating | Growth Fund Indicator |
|---|---|---|---|---|
| Morningstar Sus Globe | 1.00 | | | |
| Morningstar Risk Rating | -0.24** | 1.00 | | |
| | [-0.27, -0.20] | | | |
| Lipper Preservation Rating | 0.13** | -0.46** | 1.00 | |
| | [0.10, 0.17] | [-0.49, -0.43] | | |
| Growth Fund Indicator | 0.13** | -0.02 | 0.03 | 1.00 |
| | [0.10, 0.17] | [-0.05, 0.02] | [-0.01, 0.06] | |

*Note:* Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation. * indicates $p < .05$. ** indicates $p < .01$

**Table 2**

*Overall Summary Statistics on Variables*

| Variable | Mean | Standard Deviation | Skewness | Kurtosis |
|---|---|---|---|---|
| Fund age in years | 16.33 | 12.74 | 2.15 | 7.98 |
| Fund March TNA | 1312.83 | 4745.81 | 9.61 | 117.97 |
| Log fund TNA | 2.41 | 0.73 | 0.48 | -0.20 |
| Turnover ratio | 0.68 | 1.58 | 17.54 | 469.46 |
| Expense ratio | 0.90 | 0.41 | 0.34 | 2.18 |
| Number of dividend payment | 3.43 | 22.40 | 15.93 | 254.07 |
| Dividend payment | 0.20 | 0.35 | 9.69 | 195.19 |
| Equity allocation | 82.41 | 28.01 | -1.85 | 2.61 |
| Morningstar risk rating | 3.93 | 1.32 | -0.36 | -0.40 |
| Lipper preservation rating | 3.04 | 1.44 | -0.13 | -1.14 |
| Morningstar sustainability globe | 3.61 | 1.45 | -0.30 | -0.68 |
| Environmental risk score | 54.80 | 35.87 | -0.59 | -1.22 |
| Social risk score | 32.59 | 34.08 | 0.41 | -1.72 |
| Governance risk score | 33.67 | 21.24 | -0.63 | -1.19 |
| Total ESG risk score | 7.74 | 3.79 | 0.06 | 0.71 |
| North America | 67.23 | 34.51 | -0.91 | -0.37 |
| UK and EU | 10.41 | 14.36 | 2.17 | 4.41 |
| Asia | 8.69 | 17.89 | 3.01 | 9.17 |
| Basic materials | 4.37 | 7.79 | 8.57 | 92.14 |
| Consumer cyclicals | 11.10 | 7.71 | 2.59 | 22.31 |
| Consumer non-cyclicals | 4.77 | 5.23 | 6.27 | 87.62 |
| Energy | 3.77 | 6.92 | 7.09 | 66.21 |
| Financials | 14.33 | 11.41 | 2.58 | 14.96 |
| Healthcare | 10.03 | 9.55 | 4.84 | 39.93 |
| Industrials | 10.63 | 7.78 | 1.94 | 12.61 |
| Technology | 20.12 | 16.04 | 1.26 | 2.14 |
| Telecommunication services | 0.97 | 2.94 | 15.27 | 378.20 |
| Utilities | 2.14 | 6.45 | 9.72 | 112.85 |

**Research Method**

We performed return normalization by employing the following formula to present the differences between average funds' returns

and benchmark returns where $F_t$ is the fund's price index, $B_t$ is the benchmark's price index, $r^F_t$ is the fund's weekly return on week t and $r^B_t$ is the benchmark's weekly return on week t.

$$F_t = 100(1+r^F_1)(1+r^F_2)...(1+r^F_t) \qquad (2)$$

$$B_t = 100(1+r^B_1)(1+r^B_2)...(1+r^B_t) \qquad (3)$$

On the other hand, the benchmark-adjusted performance is achieved by log ($F_t$) – log ($B_t$) where $F_t$ and $B_t$ are the cumulative compounded weekly returns of the average fund and the benchmark indexes. Given that we intended to measure the alpha of the mutual funds via regression, the Capital Asset Pricing Model (CAPM), Fama – French 3 Factors Model, Carhart 4 Factors Model, Fama – French 5 Factors Model and Six Factors Model that incorporate Fama – French 5 Factors Model + MOM were employed to attain the alphas in our paper. The alphas are the estimated intercepts from the regression of the funds' returns and factors' returns. Besides, the risk-free rate and factors' returns (HML, SMB, MOM etc.) were obtained from Kenneth French's data library. The formulas for the mentioned models are indicated as follows:

CAPM: $\qquad E[R_i\text{-}R_f] = \alpha + \beta_{Market} E[R_M\text{-}R_f] \qquad (4)$

FF3:

$$E[R_i\text{-}R_f] = \alpha + \beta_{Market} E[R_M\text{-}R_f] + \beta_{HML}HML + \beta_{SMB}SMB \qquad (5)$$

Carhart 4:

$$E[R_i\text{-}R_f] = \alpha + \beta_{Market} E[R_M\text{-}R_f] + \beta_{HML}HML + \beta_{SMB}SMB + \beta_{MOM}MOM \quad (6)$$

FF5:

$$E[R_i\text{-}R_f] = \alpha + \beta_{Market} E[R_M\text{-}R_f] + \beta_{HML}HML + \beta_{SMB}SMB + \beta_{RMW}RMW + \beta_{CMA}CMA \quad (7)$$

FF5+MOM:

$$E[R_i\text{-}R_f] = \alpha + \beta_{Market} E[R_M\text{-}R_f] + \beta_{HML}HML + \beta_{SMB}SMB + \beta_{MOM}MOM + \beta_{CMA}CMA \qquad (8)$$

The benchmark adjusted regression model is given by:

*Benchmark Adjusted Return* $= \beta_1 HighSustainabilityGlobesIndicator + \beta_2 HighMorningstarRiskRatingIndicator + \beta_3 HighLipperPreservationRatingIndicator + \beta_4 GrowthFundIndicator + FundLevelControl + CountryLevelControl + IndustryLevelControl$ (9)

The factor adjusted regression model is given by:

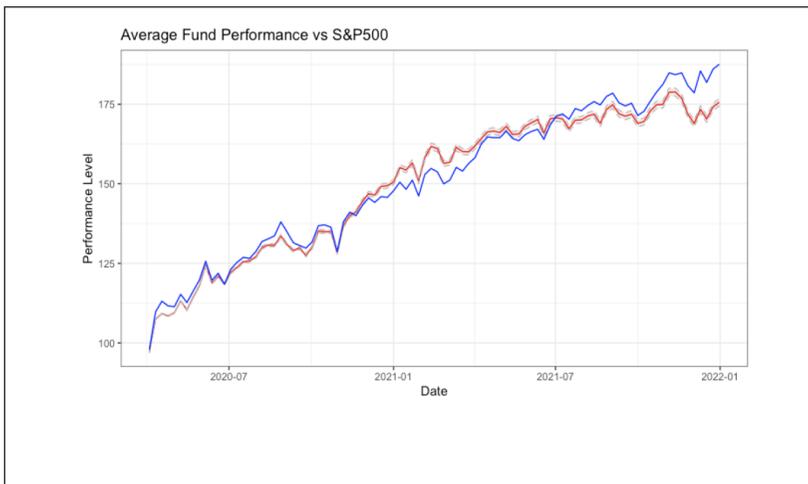**$\alpha$= $\beta_1$High Sustainability Globes Indicator + $\beta_2$High Morning star Risk**   (10)
*Rating Indicator + $\beta_3$High Lipper Preservation Rating Indicator+$\beta_4$*
*Growth Fund Indicator +Fund Level Control +Country Level*
*Control+Industry Level Control*

## RESULTS

## Fund Performance

## Figure 1

*Average Fund Performance versus the S&P 500 during the Covid-19 Crisis*
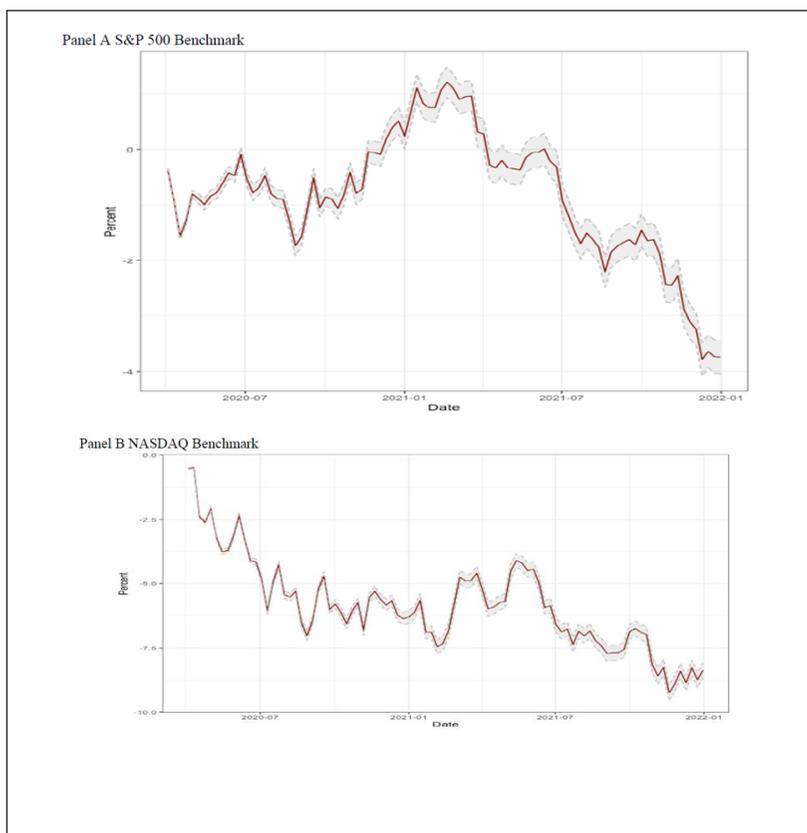


*Note:* This figure plots the performance of the average active equity mutual fund against the S&P 500 from April 03, 2020 to December 31, 2021. Both indices are initialized at 100 on the first week and computed by compounding weekly returns. The fund average performance is plotted with red line, S&P 500 in blue line and confidence intervals (95%) are filled in grey.

Figure 1 provides a preliminary view of the performance of active funds during the COVID-19 crisis, along with the benchmark's performance, the S&P 500 index. Overall, it shows that the S&P 500 index outperformed the fund average in most cases while the average active fund only dominated the index for roughly 32 weeks between November 20, 2020 and June 25, 2021.

Figure 2 shows the fund performance of the S&P 500 index (panel A), and the NASDAQ index (panel B). Unlike Figure 1 which plots the index levels, Figure 2 plots the cumulative performance of the average active fund relative to the benchmark. Figure 2 shows that the active funds' performance fluctuated in the 92 weeks relative to the S&P 500 benchmark while underperforming the NASDAQ composite index the entire time.

**Figure 2**

*Average Benchmark Adjusted Fund Performance*



*Note:* This figure plots the cumulative compound performance of the average active equity mutual fund fro, April 03, 2020 through December 31, 2021, relative to S&P 500 and NASDAQ benchmarks. Relative performance is measured by log FT – log BT where FT and BT are compounded weekly returns of fund average and benchmarks. Confidence Intervals (95%) are filled in grey.

Table 3 presents the average fund alphas from five multifactor models: Capital Asset Pricing Model (CAPM), Fama French 3 Factors Model (1993), Carhart 4 Factors Model (1997), Fama French 5 Factors Model (2015), and Fama French 5 Factors Model + MOM Model. Three alphas were spotted as negative during the selected period. However, the market coefficients from all 5 models were almost equal to 1 indicating that the funds were less volatile than the market but still moving along with the market. Whereas, both the statistically significant SMB and HML exposures revealed that the returns of the sampled mutual fund were contributed by the outperformance of smaller firms and value stocks in the portfolio. Interestingly, the negative RMW and CMA factors suggest that the average funds comprised unprofitable firms that invested aggressively, which were often accompanied by higher market beta and volatility. Overall, our alphas and fractions of fund underperforming indicated that the average mutual fund performance was satisfactory during the market boom amid the COVID–19 health crisis.

**Table 3**

*Regression Results*

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Market premium | $0.89^{***}$ | $0.82^{***}$ | $0.82^{***}$ | $0.83^{***}$ | $0.83^{***}$ |
| | (0.03) | (0.02) | (0.02) | (0.02) | (0.02) |
| SMB | | $0.26^{***}$ | $0.27^{***}$ | $0.18^{***}$ | $0.18^{***}$ |
| | | (0.02) | (0.02) | (0.03) | (0.03) |
| HML | | $0.05^{***}$ | $0.05^{***}$ | $0.10^{***}$ | $0.09^{***}$ |
| | | (0.01) | (0.02) | (0.02) | (0.02) |
| MOM | | | 0.00 | | -0.01 |
| | | | (0.02) | | (0.02) |
| RMW | | | | $-0.15^{***}$ | $-0.15^{***}$ |
| | | | | (0.03) | (0.04) |
| CMA | | | | -0.05 | -0.04 |
| | | | | (0.04) | (0.04) |
| Alpha | 0.00 | -0.01 | -0.02 | 0.03 | 0.03 |
| | (0.07) | (0.04) | (0.04) | (0.04) | (0.04) |
| Fund underperforming (in %): | 52.48 | 59.14 | 58.82 | 36.43 | 37.48 |

*Note*: Statistical significance level at $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$; Standard errors are in brackets.

### *Sustainability*

Figures 3 indicates that one-globe funds outperformed the remaining in terms of the benchmark-adjusted cumulative returns while funds with higher globe ratings did not deliver much extraordinary returns against both the S&P 500 index and NASDAQ composite index.

**Figure 3**

*Benchmark-adjusted Fund Performance: Sustainability Ratings*
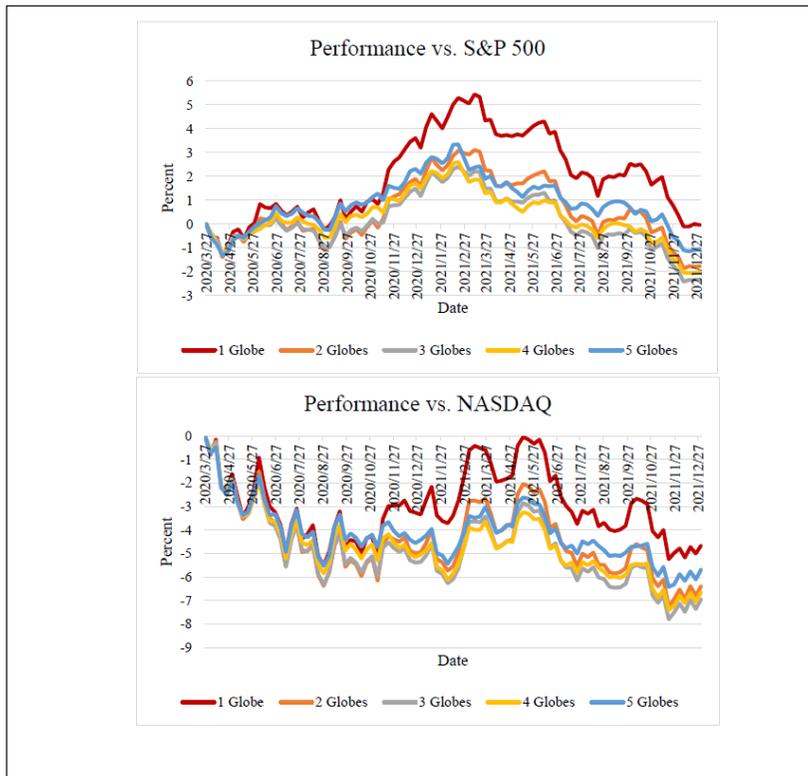


*Note:* This figure plots the cumulative compound performance from April 03, 2020 to December 31, 2021, categorized by sustainability ratings.

Table 4 analyzes the determinants of fund performance with Panel A focused on benchmark-adjusted returns using the S&P 500 benchmark and Panel B focused on alpha using the Carhart four-factor model. It shows that the high sustainability rating (4 and 5 sustainability globes) does not have much explanatory ability on

both the benchmark-adjusted return and four-factors alpha (risk-adjusted return) since there is diminishing statistical significance or coefficients spotted in Table 4 after the augmentation of various control variables. Such output is not surprising even though they are different from the notably outstanding results presented in Pastor and Vorsatz's paper because the outperformance of mutual funds with high sustainability rating during the economic chaos was often at the cost of inferior performance during market boom (Nofsinger & Varma, 2014). Additionally, sustainable investing could only be taken as a hedge during the market downturn since there was no superior performance found in the funds with a high Morningstar sustainability globe (Halbritter & Dorfleitner, 2015; Kim et al., 2014; Steen et al., 2020). In other words, there is no concrete conclusion to be derived from our analysis but it is assured that sustainable mutual funds could be utilized to improve portfolio diversification for extreme losses mitigation when the market is volatile (Dai, 2021).

The table reports coefficients estimated from regressions of fund performance from April 3, 2020 to December 31, 2021, using the S&P 500 benchmark. All levels of control are thoroughly described in the Data section.

### *Morningstar Risk Rating & Lipper Preservation Rating*

Besides sustainability, the most crucial determinant of active fund performance is the funds' rating awarded by a rating agency like Morningstar or Lipper. Similar to the layouts from Figure 3, Figure 4 plots the cumulative benchmark-adjusted fund performance for groups of funds with different ratings. The relationship between benchmark-adjusted performance and risk/preservation ratings was monotonic across the five-star groups, with five-star funds performing the best and one-star funds performing the worst for Morningstar risk rating and vice versa for Lipper preservation rating.

Undoubtedly, Table 4 shows the atypical explanatory power for the ratings granted by Morningstar and Lipper in terms of benchmark-adjusted returns and alphas. There was a statistically significant positive association between the high Morningstar risk rating (4 and 5 ratings) and benchmark-adjusted returns. In comparison, a negative correlation was detected in the high Lipper preservation rating (4 and 5 ratings). The outperformance generated by a high Morningstar risk rating should not be astonishing given that risky investment vehicles often guarantee higher returns as compensation for investors' risk tolerance (Lintner, 1965; Sharpe, 1964).

**Table 4**

*Determinants of Fund Performance During the Crisis*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| High Sustainability Globes Indicator | -0.03 | | | | 0.01 | -0.04 | 0.16 | -0.19 |
| | (0.20) | | | | (0.18) | (0.16) | (0.15) | (0.13) |
| High Morningstar Risk Rating Indicator | | 3.09*** | | | 2.20*** | 2.46*** | 2.40*** | 2.08*** |
| | | (0.21) | | | (0.17) | (0.15) | (0.15) | (0.13) |
| High Lipper Preservation Rating Indicator | | | -4.45*** | | -2.78*** | -2.20*** | -2.35*** | -1.26*** |
| | | | (0.21) | | (0.17) | (0.16) | (0.17) | (0.15) |
| Growth Fund Indicator | | | | 6.14*** | 5.21*** | 3.53*** | 3.00*** | 1.74*** |
| | | | | (0.28) | (0.20) | (0.20) | (0.20) | (0.20) |
| Constant | 0.16 | -1.81*** | 0.97*** | -1.878*** | -0.58*** | -7.40*** | -6.64*** | -2.55 |
| | (0.112) | (0.125) | (0.135) | (0.114) | (0.14) | (0.49) | (1.21) | (2.60) |
| Fund Level Control | No | No | No | No | No | Yes | Yes | Yes |
| Country Level Control | No | No | No | No | No | No | Yes | Yes |
| Industry Level Control | No | No | No | No | No | No | No | Yes |
| Observations | 3,012 | 3,241 | 3,430 | 3,432 | 2,910 | 2,910 | 2,910 | 2,910 |
| R² | 0.00 | 0.07 | 0.11 | 0.127 | 0.304 | 0.466 | 0.50 | 0.630 |
| Adjusted R² | -0.00 | 0.06 | 0.11 | 0.126 | 0.303 | 0.463 | 0.50 | 0.623 |
| Residual Std. Error | 5.11 (df=3010) | 5.66 (df=3239) | 6.11 (df=3428) | 6.06 (df=3430) | 4.22 (df=2905) | 3.71 (df=2894) | 3.58 (df=881) | 3.10 (df=2856) |
| F-statistic | 0.02 (df=1; 3010) | 223.86*** (df=1; 3239) | 438.95*** (df=1; 3428) | 496.90*** (df=1; 3430) | 316.85*** (df=4; 2905) | 168.19*** (df=15; 2894) | 104.42*** (df=28; 2881) | 91.71*** (df=53; 2856) |

*Note*: Statistical significance level at $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$; Standard errors are in brackets.
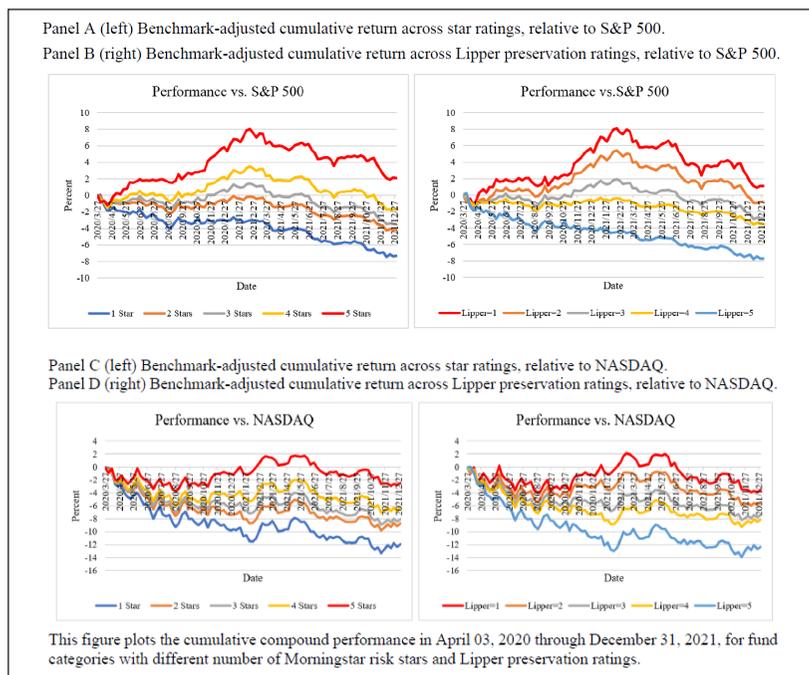*Panel B: Factor Adjusted Regression Results*

(continued)

98

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| High Sustainability Globes Indicator | 0.63 | | | | 0.42 | 0.23 | 0.62* | 0.47 |
| | (0.38) | | | | (0.39) | (0.38) | (0.36) | (0.34) |
| High Morningstar Risk Rating Indicator | | 0.90** | | | 1.95*** | 1.95*** | 1.80*** | 1.44*** |
| | | (0.36) | | | (0.38) | (0.38) | (0.36) | (0.34) |
| High Lipper Preservation Rating Indicator | | | 3.75*** | | 3.95*** | 2.23*** | 1.60*** | 3.33*** |
| | | | (0.34) | | (0.38) | (0.40) | (0.41) | (0.39) |
| Growth Fund Indicator | | | | 0.26 | 0.83* | 1.08** | 0.11 | -0.82 |
| | | | | (0.45) | (0.45) | (0.49) | (0.50) | (0.51) |
| Constant | -2.63*** | -2.26*** | -3.41*** | -1.93*** | -5.01*** | 4.80*** | -8.96*** | -17.42*** |
| | (0.21) | (0.22) | (0.22) | (0.19) | (0.32) | (1.37) | (3.02) | (6.65) |
| Fund Level Control | No | No | No | No | No | Yes | Yes | Yes |
| Country Level Control | No | No | No | No | No | No | Yes | Yes |
| Industry Level Control | No | No | No | No | No | No | No | Yes |
| Observations | 3,012 | 3,241 | 3,430 | 3,432 | 2,910 | 2,910 | 2,910 | 2,910 |
| R² | 0.00 | 0.00 | 0.03 | 0.00 | 0.03 | 0.10 | 0.19 | 0.34 |
| Adjusted R² | 0.00 | 0.00 | 0.03 | -0.00 | 0.03 | 0.10 | 0.18 | 0.33 |
| Residual Std. Error | 9.67 (df = 3010) | 9.87 (df = 3239) | 9.77 (df = 3428) | 9.94 (df = 3430) | 9.47 (df = 2905) | 9.16 (df = 2893) | 8.702 (df = 2880) | 7.88 (df = 2855) |
| F-statistic | 2.65 (df = 1; 3010) | 6.26** (df = 1; 3239) | 122.12*** (df = 1; 3428) | 0.34 (df = 1; 3430) | 29.30*** (df = 4; 2905) | 21.42*** (df = 16; 2893) | 24.32*** (df = 29; 2880) | 28.03*** (df = 54; 2855) |

*Note:* Statistical significance level at *p<0.1; **p<0.05; ***p<0.01; Standard errors are in brackets.

Besides, we suggest that the ostensible reason for the negative benchmark-adjusted returns found in the Lipper preservation ratings is because the funds with high Lipper ratings are negatively-correlated to the market as the high rating is awarded to preserving funds during market turmoil. Thus, the funds with high Lipper ratings perform poorly during market uptime but remain resilient during market downtime. At the same time, Panel B shows that funds with high ratings (Morningstar and Lipper) can deliver alphas after including all levels of controls. However, the alphas displayed by the high-rated funds do not always signal active fund managers' masterful asset allotment skills. Indeed, these alphas could be a 'dressed up' alpha that incorporates unknown risk factors not addressed by the multi-factor models.

**Figure 4**

*Benchmark-adjusted Fund Performance: Morningstar Risk Ratings*



This figure plots the cumulative compound performance in April 03, 2020 through December 31, 2021, for fund categories with different number of Morningstar risk stars and Lipper preservation ratings.
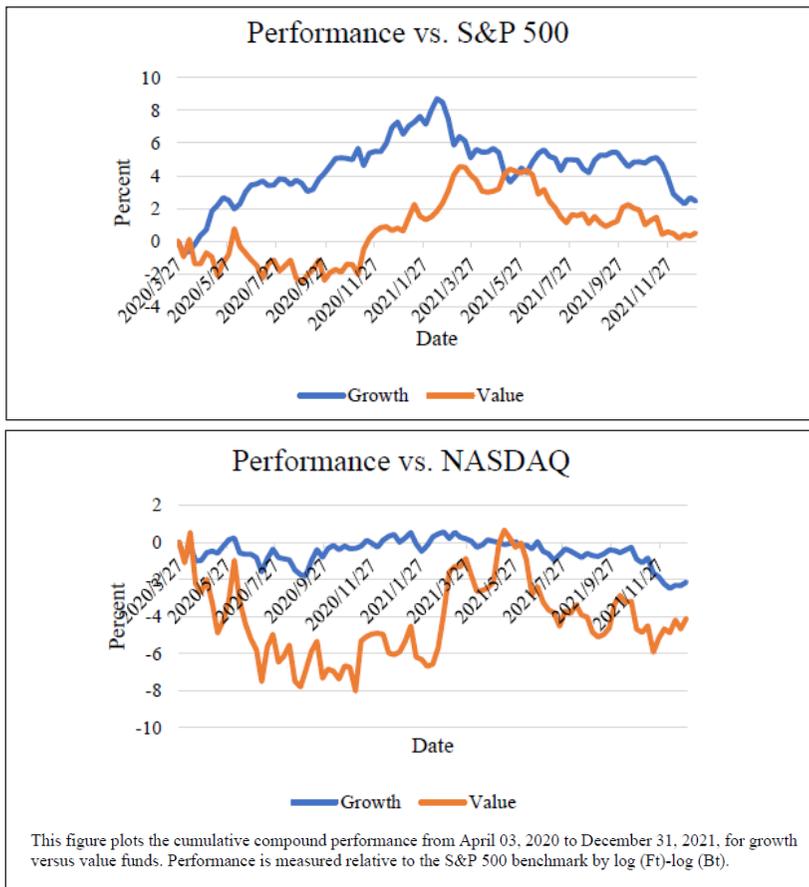
### *Value Versus Growth*

Value investing vs. growth investing has been an ongoing debate in the financial industry, given that the value premiums are strongly

advocated by Fama and French (1992) and Graham (1949) Interestingly, we noticed that in most cases, growth funds seemed to generate better excess benchmark-adjusted returns during our sampling period. Specifically, the outperformance of growth funds in terms of benchmark-adjusted returns is captured in Figure 5 and Table 4.

**Figure 5**

*Benchmark-adjusted Fund Performance: Growth versus Value Funds*



This figure plots the cumulative compound performance from April 03, 2020 to December 31, 2021, for growth versus value funds. Performance is measured relative to the S&P 500 benchmark by log (Ft)-log (Bt).

The outperformance could be due to the fading glory of the value premium in the recent decade as is widely known by the public (Fama & French, 2021); the complex relationship between the low-interest-rate environment fueled by expansionary monetary policy and value portfolios (Maloney & Moskowitz, 2021); the

101

outperformance of large-cap growth portfolios due to the emergence of technology companies after the global financial crisis (Bevanda et al., 2021); business flexibility and cost reversibility of growth companies allow companies to redistribute their resources efficiently during critical moments (Zhang, 2005) and/or the out powering of large-cap growth stocks attributed to the superior performance of healthcare/biotechnology and technology companies in the sluggish economic environment (Lauricella, 2015). The stated rationales could help to explain the significant benchmark-adjusted returns found in growth funds (growth tilt). In particular, we noticed an explicit/sharp weakening coefficient for growth fund indicators in Table 4 when controlling the industry level variables, including the percentage of TNA in numerous industries and industry fund indicator in 'Lipper Objective'. In addition, no constant statistical significance was spotted in Panel B (Carhart alpha) under Table 4.

## CONCLUSION

Overall, our analysis is an extension of Pastor and Vorsatz's paper which aims to shed some light on the performance of mutual funds during the market boom period in the midst of the COVID-19 health crisis. After conducting a thorough analysis of the mutual fund performance from April 2020 to December 2021, we found that the active funds were incapable of exploiting the price dislocation during the market crash period (February 2020 to March 2020) to beat the market benchmark in most cases.

Specifically, we noted that the Morningstar sustainability globe stressed weak explanatory power on the performance of mutual funds, contradicting the hypothesis that mutual funds with a high Morningstar sustainability globe would be able to deliver a more superior return. Hence, we put forward that ESG fund is susceptible to be considered a portfolio diversification strategy to hedge risks when the market is highly volatile; which concurs with findings by Halbritter and Dorfleitner (2015) and Steen et al. (2020). In particular, the remarkable predictability power of Morningstar sustainability globe in Pastor and Vorsatz's paper occurred only during the crisis period when the market was vulnerable. The astonishing performance of the socially responsible funds during the market crisis was potentially due to the investors' flight-to-safety thinking as investors shifted their

investments to the highly sustainable funds due to the firms' quality amid the highly unpredictable period (Pastor & Vorsatz, 2020).

Next, we also found that the rating awarded by the rating agencies namely Morningstar and Lipper indicated a strong explanatory ability on the performance of mutual funds during the boom period amid the COVID-19 crisis. Our analysis revealed that the funds with a high Morningstar risk rating could deliver superior benchmark-adjusted returns and alphas, which should not be surprising since classical finance theory has reiterated that investors ought to be compensated with higher returns for acquiring additional units of risk. The substantially positive alphas found in the high-rated funds (Morningstar and Lipper) do not necessarily imply outperformance by fund managers' skilful asset allocation. Indeed, these alphas could be 'dressed-up' alphas that consist of unknown risk factors that the Carhart four-factor model failed to capture. These statistically significant extraordinary alphas do not fully convey that the ratings awarded are the best elements to scrutinize when making investment decisions as Blake and Morey (2000) have asserted that high ratings from rating agencies do not guarantee desirable future returns but low ratings always signal persistently poor performance.

Furthermore, we observed adequate returns delivered by growth portfolios in our analysis which contradicts the typical finance theory that emphasizes value premium. Therefore, we respectfully propose that the outperformance of growth portfolios be subject to growth companies' business flexibility, which often comprises intangible assets (Zhang, 2005) that allow them to cater to the abrupt change in consumers' needs in view of the unique COVID-19 health crisis. That being said, the deluge of growth funds in our analysis could also be due to investors' overreaction toward growth companies, especially the technology industry/firms (Lakonishok et al., 1994) since sophisticated fund managers often revel in the rise of technology/specific industry bubble while the overall investors have blind faith in a particular industry (Brunnermeier & Nagel, 2004; Griffin et al., 2011).

Moving forward, we think that there is plenty of room for future research, mainly to explore the performance of fixed-income and money market funds in the bullish market during the COVID-19 crisis, especially with the emergence of cryptocurrencies as an unconventional investment which has exerted a certain level of pressure on traditional investment vehicles.

## ACKNOWLEDGMENT

## REFERENCES

Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate social responsibility and firm risk: Theory and empirical evidence. *Management Science*, *65*(10), 4451-4469.

Albuquerque, R., Koskinen, Y., Yang, S., & Zhang, C. (2020). Resiliency of environmental and social stocks: An analysis of the exogenous Covid-19 market crash. *The Review of Corporate Finance Studies*, *9*(3), 593-621.

Bevanda, L., Zaimović, A., & Arnaut-Berilo, A. (2021). Performance of value and growth stocks in the aftermath of the global financial crisis. *Business Systems Research*, *12*(2), 268-283.

Blake, C. R., & Morey, M. R. (2000). Morningstar ratings and mutual fund performance. *Journal of Financial and Quantitative Analysis*, *35*(3), 451-483.

Bogle, J. (2002). An index fund fundamentalist. *The Journal of Portfolio Management, 28*, 31-38.

Brunnermeier, M. K., & Nagel, S. (2004). Hedge funds and the technology bubble. *The Journal of Finance (New York), 59*(5), 2013-2040.

Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, *52*(1), 57-82.

Chevalier, J., & Ellison, G. (1999). Career concerns of mutual fund managers. *The Quarterly Journal of Economics*, *114*(2), 389-432.

Dai, Y. (2021). Can ESG investing beat the market and improve portfolio diversification? Evidence from China. *The Chinese Economy*, *54*(4), 272-285.

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, *47*(2), 427-465.

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, *33*(1)*,* 3-56.

Fama, E. F., & French, K. R. (1996). Multifactor explanations of asset pricing anomalies. *The Journal of Finance*, *51*(1), 55-84.

Fama, E. F., & French, K. R. (2021). The value premium. *Review of Asset Pricing Studies*, *11*(1), 105-121.

Ferriani, F., & Natoli, F. (2021). ESG risks in times of Covid-19. *Applied Economics Letters*, *28*(18), 1537-1541.

Graham, B. (1949). *The intelligent investor*. Harper & Brothers.

Griffin, J. M., Harris, J. H., Shu, T., & Topaloglu, S. (2011). Who drove and burst the tech bubble? *The Journal of Finance (New York), 66*(4), 1251-1290.

Grinblatt, M., & Titman, S. (1989). Mutual fund performance: An analysis of quarterly portfolio holdings. *The Journal of Business, 62*(3), 393-416.

Grinblatt, M., & Titman, S. (1993). Performance measurement without benchmarks: An examination of mutual fund returns. *The Journal of Business, 66(1)*, 47-68.

Grinblatt, M., Titman, S., & Wermers, R. (1995). Momentum investment strategies, portfolio performance, and herding: A study of mutual fund behavior. *The American Economic Review, 85*(5), 1088-1105.

Halbritter, G., & Dorfleitner, G. (2015). The wages of social responsibility—Where are they? A critical review of ESG investing. *Review of Financial Economics*, *26*, 25-35.

Hartzmark, S. M., & Sussman, A. B. (2019). Do investors value sustainability? A natural experiment examining ranking and fund flows. *The Journal of Finance*, *74*(6), 2789-2837.

Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *The Journal of finance*, *23*(2), 389-416.

Kim, Y., Li, H., & Li, S. (2014). Corporate social responsibility and stock price crash risk. *Journal of Banking & Finance*, *43*(1), 1-13.

Kosowski, R. (2011). Do mutual funds perform when it matters most to investors? US mutual fund performance and risk in recessions and expansions. *The Quarterly Journal of Finance*, *1*(03), 607-664.

Lakonishok, J., Shleifer, A., & Vishny, R. W. (1994). Contrarian investment, extrapolation, and risk. *The Journal of Finance*, *49*(5), 1541-1578.

Lauricella, T. (2015, May 4). Fund fiend: Growth beats value. (If investors care.) As growth has pulled ahead, investors seem to have turned off the channel. *The Wall Street Journal.*

Lesser, K., Rößle, F., & Walkshäusl, C. (2016). Socially responsible, green, and faith-based investment strategies: Screening activity matters! *Finance Research Letters*, *16*(C), 171-178.

Lettau, M., & Ludvigson, S. (2001). Resurrecting the (C) CAPM: A cross-sectional test when risk premia are time-varying. *Journal of Political Economy*, *109*(6), 1238-1287.

Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *The Journal of Finance*, *72*(4), 1785-1824.

Lintner, J. (1965). Security prices, risk, and maximal gains from diversification. *The Journal of Finance*, *20*(4), 587-615.

Maloney, T., & Moskowitz, T. J. (2021). Value and interest rates: Are rates to blame for value's torments? *The Journal of Portfolio Management*, *47*(6), 65-87.

Markowitz, H. (1952). The utility of wealth. *Journal of Political Economy*, *60*(2), 151-158.

Moskowitz, T. J. (2000). Mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses: Discussion. *The Journal of Finance*, *55*(4), 1695-1703.

Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica*, *34*(4), 768-783.

Nofsinger, J., & Varma, A. (2014). Socially responsible funds and market crises. *Journal of Banking & Finance*, *48*, 180-193.

Pastor, Ľ., & Stambaugh, R. F. (2000). Comparing asset pricing models: An investment perspective. *Journal of Financial Economics*, *56*(3), 335-381.

Pastor, Ľ., & Vorsatz, M. B. (2020). Mutual fund performance and flows during the Covid-19 crisis. *The Review of Asset Pricing Studies*, *10*(4), 791-833.

Pastor, Ľ., Stambaugh, R. F., & Taylor, L. A. (2021). Sustainable investing in equilibrium. *Journal of Financial Economics*, *142*(2), 550-571.

Petkova, R., & Zhang, L. (2005). Is value riskier than growth? *Journal of Financial Economics*, *78*(1), 187-202.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, *19*(3), 425-442.

Sharpe, W. F. (1966). Mutual fund performance. *The Journal of Business*, *39*(1), 119–138.

Steen, M., Moussawi, J., & Gjolberg, O. (2020). Is there a relationship between Morningstar's ESG ratings and mutual fund performance? *Journal of Sustainable Finance & Investment, 10*(4), 349-370.

Tobin, J. (1958). Liquidity preference as behavior towards risk. *The Review of Economic Studies, 25*(2), 65-86.

Treynor, J. L. (1965). How to rate management of investment funds. *Harvard Business Review, 43*(1), 63-75.

Treynor, J. L. (1961). Market value, time, and risk. Time, and Risk (August 8, 1961).

Wermers, R. (2000). Mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses. *The Journal of Finance*, *55*(4), 1655-1695.

Zhang, L. (2005). The value premium. *The Journal of Finance*, *60*(1), 67-103.