

# ESG PERFORMANCE AND RISK

The capitalization-weighted market portfolio is an important benchmark because it is the opportunity-cost investment, and in theory it should provide the highest expected risk-adjusted return for forward-looking investors. All intentional deviations from the market portfolio are active investment decisions, by definition.

Active equity managers deviate from the market portfolio of stocks because of their strong preferences or their beliefs about expected return and risk. Such deviations result in a level of idiosyncratic (unsystematic) risk vs. the market, which may or may not be compensated with a risk-adjusted excess return. Likewise, investing based on environmental, social and governance (ESG) criteria intentionally deviates from the market portfolio, resulting in idiosyncratic risk, which may or may not be compensated with excess return.

ESG is a form of active management – even when implemented with rulesbased ESG index funds. An advocate for ESG investing might argue that ESG considerations improve investment performance or reduce risk. An advocate for efficient-market theory (EMT) would counter that the idiosyncratic risk from ESG investing is uncompensated and diversifiable. We conduct an empirical evaluation of ESG fund performance and risk to investigate these two hypotheses.

Our sample includes 128 active and indexed US mutual funds and ETFs from the Morningstar database that are designated as ESG. The start date for each fund in our sample is when Morningstar verified ESG implementation, the earliest being October 2018. Although this limits our sample size, it significantly mitigates the problem of greenwashing, whereby fund sponsors overstate ESG characteristics for marketing purposes. Funds must have a minimum of 24 months of returns to be included in the sample, which runs through January 2023. For mutual funds with multiple share classes the lowest cost share class is used to better represent the opportunity set for high-net-worth and institutional investors. For each fund, we assess their unique return history versus the cap-weighted market portfolio and an appropriate risk-factor model.

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# **ESG PERFORMANCE**

The Russell 3000 index is a good proxy for the cap-weighted market portfolio of US equities. The efficiency ratio is a measure of risk-adjusted return.<sup>1</sup> Since funds in our sample have different inception dates and thus experience returns over different return and risk environments, we compute an excess efficiency ratio as the difference between an ESG fund's efficiency ratio and the Russell 3000's efficiency ratio over each fund's unique return history. A positive excess efficiency ratio indicates ESG risk-adjusted outperformance. The average and median excess efficiency ratios are 0.00. About half of the ESG funds in the sample outperformed the Russell 3000 (risk-adjusted), and half underperformed.

A more sophisticated way to evaluate risk-adjusted performance is through factor attribution. Academics have identified a small set of systematic risk factors that have been shown to explain equity returns. We use the Fama French five-factor model (2015) to test ESG fund performance.<sup>2</sup> The model includes market, size, value, profitability and investment factors. Importantly, none of these factors include ESG criteria. Exhibit 1 shows the summary results for ESG funds in our sample, with mean alpha (risk-adjusted excess return) and factor betas (exposures) on the top row and their respective t-statistics on the bottom row. The five factors explain fully 95% of the return variation of ESG funds on average, which is very high.

### **EXHIBIT 1 - FACTOR ATTRIBUTION**

	Alpha	Market	Size	Value	Profit	Invt
Alpha/Betas	0.41%	0.96	0.07	0.03	0.09	-0.05
t-Stat	0.15	34.31	0.23	0.43	1.59	-0.45

The mix of factor betas in Exhibit 1 is not too different from the cap-weighted stock market (which has a 1.00 market beta and 0.00 betas for the other four factors). One key difference is the 0.09 profitability beta, which is notable for its elevated average t-statistic (1.59). A closer inspection finds about half of the ESG funds in our sample have a statistically significant profitability beta (t-statistic > 2.0). This suggests that the main difference between diversified ESG strategies and the broad cap-weighted stock market is that ESG investing criteria tend to result in portfolios with a slight bias for highly profitable firms relative to the total market.

After adjusting ESG fund performance for exposures to these risk factors, the average alpha is statistically insignificant (i.e., indistinguishable from zero). Furthermore, a standard confidence test finds only two ESG funds with statistically significant positive alphas when we should expect to find three in our sample by random chance. This means there is no unique return premium associated with ESG criteria. Compensated ESG returns are fully explained by exposures to well-documented, non-ESG systematic risk factors.

<sup>1</sup> The efficiency ratio is the arithmetic mean return divided by the standard deviation. It can be used to compare the risk-adjusted return of different multi-asset-class portfolios, or different portfolios of the same asset class.

<sup>2</sup> Fama and French, "A Five-Factor Asset Pricing Model," The Journal of Financial Economics (2015).

# **ESG RISK**

Some ESG proponents claim that ESG criteria reduce investment risk. In contrast, EMT predicts that deviating from the market by employing ESG criteria would result in idiosyncratic risk that is uncompensated and diversifiable. We evaluate three perspectives of risk relative to the Russell 3000 – active risk, excess volatility, and excess drawdown – along with the spread of risk outcomes across these risk statistics.

Active risk (tracking error) is the most common excess or relative-risk statistic. It measures return dispersion from a benchmark (the Russell 3000 here, which has an active risk of 0.0% by definition). Low active risk is important to investors who want to experience returns close to an opportunity-cost benchmark. The first row of Exhibit 2 shows active risk across quantiles (percentile outcomes). The median (50% quantile) active risk of ESG funds in our sample is 5.19%, which is consistent with active equity in general. However, the higher active risk quantiles (75% and 95%) show significant potential deviation of ESG strategies from the returns of the cap-weighted US equity market.

## EXHIBIT 2 – EXCESS RISK

	5%	25%	50%	75%	95%
Active Risk	1.98%	3.03%	5.19%	7.62%	11.87%
Excess Volatility	-2.11%	-0.69%	0.12%	1.80%	5.22%
Excess Drawdown	-11.46%	-4.86%	-1.71%	-0.35%	3.71%

Next we look at excess volatility, which is perhaps more intuitive than active risk.<sup>3</sup> We compute excess volatility as the difference between an ESG fund's standard deviation and the Russell 3000's standard deviation over each fund's unique history. A positive excess volatility indicates more absolute volatility risk for an ESG fund. The second row of Exhibit 2 shows excess volatility vs. the Russell 3000 across quantiles. The median is just 0.12% (the average is 0.66%), but the higher excess volatility quantiles (75% and 95%) show much more volatility risk for some ESG funds when compared to the Russell 3000.

Finally, we evaluate maximum drawdown. We compute excess drawdown as the difference between an ESG fund's maximum drawdown and the Russell 3000's maximum drawdown over each fund's unique history. A negative excess drawdown indicates a lower drawdown for an ESG fund. The third row of Exhibit 2 shows excess drawdown vs. the Russell 3000 across quantiles. The median excess drawdown is -1.71%, while the lower excess drawdown quantiles (5% and 25%) show even more severe drawdown risk for some ESG funds. Indeed, 78% of ESG funds in the sample had more severe drawdowns than the Russell 3000.

Clearly there is idiosyncratic risk to ESG investing, which can manifest as elevated volatility and more severe drawdowns. But perhaps the main risk is the spread of potential outcomes across the opportunity set of ESG strategies, which can result in materially more risk than the cap-weighted market.

<sup>3</sup> The key difference between active risk and excess volatility is that active risk also takes into account correlation with the benchmark.

Robust performance tests of market efficiency require decades of returns data, and such studies nearly always support EMT. In contrast, ESG investing is relatively new and our small sample suffers from a short history that coincides with increased ESG adoption. Nonetheless our overall empirical results are consistent with EMT, which is perhaps not all that surprising. We find no evidence of outperformance or risk reduction when incorporating ESG criteria into an investment strategy. But at the same time, we find no meaningful underperformance either (at least on average), which is good news for investors with strong ESG preferences.

All active investors incorporate their beliefs and preferences into their portfolios, and in this regard ESG is no different. We believe investors with strong ESG preferences are more likely to stay the course when they have realistic expectations regarding long-term performance and risk. As always, broad diversification and low fees will be key determinants of long-term success.

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