

An Example of Negative Screening Application in ESG Investing

Jiayi Lu *

College of Design and Engineering, National University of Singapore, Singapore

* Corresponding Author Email: e0973584@u.nus.edu

Abstract. ESG (Environmental, Social, and Governance) investing is taken into consideration by many long-term institutional investors for their portfolios. ESG investment includes reducing stakeholder risk, relying on longer investment horizons, and targeting non-mainstream market segments. Negative screening is one of the easiest methods to construct a portfolio for ESG investing and has been widely used by investors. The Sharpe ratio is one of the most common statistics used to evaluate the expected return of a portfolio. Negative screening is an important strategy in the ESG investing landscape, enabling investors to align their portfolios with their values and potentially reduce exposure to related risks. While negative screening is straightforward, there are some limitations associated with it, making the development of more reliable methods for ESG investing increasingly important. This article focuses on developing a simple approach to ESG investing using negative screening.

Keywords: ESG, negative screening, Sharpe ratio, portfolio theory, investment decision making.

1. Introduction

ESG (Environmental, Social, and Governance) investing is considered by many long-term institutional investors for their portfolios [1]. It is a wide field with many different investment methods, such as ESG integration, values-based investing, and impact investing [2]. The features of ESG investment include reducing stakeholder risk, relying on longer investment horizons, and finding a non-mainstream market segment [3].

Negative screening, a method that reached its highest investment value in 2018, amounting to \$19.7 trillion, remained the most widely used ESG investment approach in the region as of 2020 [4]. A prevalent form of negative screening, commonly adopted by institutional investors prioritizing ESG factors, involves excluding stocks of companies engaged in alcohol, tobacco, gaming industries, as well as those involved in fossil fuel extraction, such as coal, gas, or oil [5]. Negative screening involves identifying and excluding companies that engage in practices that are deemed unacceptable by investors. Climate change and greenhouse gas emissions, pollution and waste management, and natural resource conservation are evaluated in environmental factors. Social factors focus on aspects such as labor rights, working conditions, human rights, and community impact and relations. Governance factors include corporate governance and transparency, as well as executive compensation. These factors need to be considered before constructing a portfolio.

The Sharpe ratio is one of the most common statistics used to evaluate the expected return of the portfolio and its standard deviation [6]. The Sharpe ratio refers to the amount of additional return that can be obtained for each additional point of risk and is usually used as a proxy for risk-adjusted returns. If it is higher than 1, it means that the return rate of the fund is higher than the volatility risk; If it is lower than 1, it means that the risk of fund operation is greater than the rate of return [7]. When using negative screening in ESG investment, the easiest way is to analyze environment, social, and governance factors. After that, the next step involves collecting the historic data of the selected stocks. The final step involves calculating the ideal portfolio return with the highest Sharpe ratio. This article focuses on using a simple way to construct an ESG negative screening portfolio. This research will provide guidance for investors to build a portfolio that balances risk and return while meeting ESG investment criteria. In this method, SLB, CRTO, AVDL, ORAN, stocks listed on NASDAQ were selected as samples to meet the goal. This research may contribute to investors in making their

investment decisions. The rest of this paper is structured as follows: Section 2 will introduce the methodology used for the analysis, followed by Section 3, which will use the method mentioned to perform the process of building the portfolio. Finally, Section 4 will review and summarize the overall paper.

2. Methodology

As negative screening is one of the most common ways of ESG investing, this article provides an example of how to use negative screening for ESG investing. The first step is to choose the investment range. This article focuses on French stocks that have been listed on the NASDAQ for more than three years and whose share price has not fallen by more than 80% in three years. After establishing exclusion criteria aligned with values or investment objectives, the next steps involve data collection, portfolio construction, and management. The equation for calculating the yearly expected return is shown in Equation (1).

$$E(r_p) = \frac{\sum E(r)}{n} \times 12 \quad (1)$$

$E(r)$ -- Return for each month.

n -- The number of months.

The yearly standard deviation formula is showed in Equation (2).

$$stdv = \sqrt{\frac{12}{N} \times (x_i - \mu)^2} \quad (2)$$

x_i -- Return for each month

μ -- The number of months

Finally, calculating the portfolio with Markowitz Model and assessing the Sharpe ratio and return of the portfolio. The Sharpe ratio formula can be found in Equation (3).

$$S = \frac{rise}{run} = \frac{E(r_p) - r_f}{\sigma_p} \quad (3)$$

$E(r_p)$ -- Expected return.

σ_p -- Standard deviation.

r_f -- Risk-free rate.

When calculated Sharpe ratio, the rate of return on the risk-free asset (r_f) is 3.90%, the average 10-year Treasury interest rate from August 2022 to February 2024. All data collected from various sources on the internet, particularly from investment websites. In this method, the objective is to identify the solution with the highest Sharpe ratio, as a higher Sharpe ratio indicates a higher ratio of expected return to volatility risk.

Investors must analyze how negative screening affects diversification and performance, ensuring alignment with overall investment goals. By following these steps systematically, investors can effectively implement negative screening and navigate the complex landscape of sustainable investing.

3. Sample

After screening the French stocks listed on NASDAQ, seven listed companies were chosen:

(1) TotalEnergies: One of the world's six largest oil companies and one of the largest companies in Europe by market capitalization. Its business scope covers the entire oil and gas industry chain, from the exploration and development of crude oil and natural gas to power generation, transportation, refining, sales of petroleum products, and international crude oil and product trading.

(2) Schlumberger Technology Services, Inc. (SIS): Part of Schlumberger Oilfield Services, provides application software, information management services, infrastructure IT services, and business consulting services to oil and gas companies worldwide.

(3) Sanofi: The world's fifth-largest pharmaceutical company dedicated to the research, development, production, and marketing of pharmaceutical products in seven main areas: cardiovascular diseases, thrombosis, oncology, diabetes, central nervous system, internal medicine, and vaccines.

(4) Criteo SA: A global technology company specializing in digital performance marketing. The company enables e-commerce companies to leverage large amounts of fine-grained data to attract and convert customers. The company was founded in November 2005 by Jean-Baptiste Rudelle, Franck Le Ouay, Pascal Gauthier, Laurent Quatrefages, and Romain Niccoli.

(5) Avadel: A biopharmaceutical company focused on transforming medicines to transform lives. Its approach includes applying innovative solutions to the development of medications that address the challenges patients face with current treatment options.

(6) Orange S.A.: A French multinational telecommunications corporation with 266 million customers worldwide and employing 89,000 people in France and 59,000 people elsewhere.

(7) EDAP TMS: A global leader in therapeutic ultrasound with over 35 years of presence in the market. It is actively operating worldwide via an extensive network of corporate offices, subsidiaries, and distribution partners. The company has developed a strong and valuable patent portfolio based on its innovative technologies.

4. Result and Discussion

4.1. ESG Evaluation

With the rules for stock selection in place, seven stocks were chosen for negative screening. During the negative screening process, the backgrounds of the selected companies were investigated, and those with negative information related to E, S, and G factors, such as pollution control, labor rights, and information transparency, were excluded from the portfolio.

TotalEnergies was excluded from the portfolio due to a scandal in 2023 where its production processes caused significant environmental pollution [8]. There were no obvious problems found for the other companies in terms of E, S, and G factors. The remaining stocks in the portfolio are SLB, SNY, CRTO, AVDL, ORAN, and EDAP.

4.2. Risk and Return of Candidate Companies

The returns of the six stocks from August 2022 to February 2024 are shown in Table 1. Additionally, the yearly mean return and standard deviation data for the six selected equities are provided in Table 2. Based on their performance, SNY and EDAP are deemed suboptimal and thus are excluded from the portfolio. Consequently, SLB, CRTO, AVDL, and ORAN are the selected stocks for inclusion in the portfolio.

Table 1. Return of 6 stocks from August 2022 to February 2024.

	SLB	SNY	CRTO	AVDL	ORAN	EDAP
Aug-22	3.16%	-18.14%	6.38%	40.38%	-0.88%	14.77%
Sep-22	-5.68%	-7.69%	0.04%	-24.55%	-12.20%	-2.60%
Oct-22	46.82%	14.43%	-5.66%	31.54%	6.69%	14.91%
Nov-22	-0.95%	5.13%	6.12%	39.15%	7.93%	19.41%
Dec-22	4.16%	7.09%	-3.70%	-21.92%	0.02%	-5.83%
Jan-23	6.75%	1.53%	16.08%	5.10%	7.89%	3.19%
Feb-23	-6.32%	-4.85%	9.59%	32.23%	8.94%	7.00%
Mar-23	-7.88%	16.84%	-4.96%	-7.94%	4.20%	-5.95%
Apr-23	0.52%	-1.47%	-0.17%	14.41%	9.76%	-2.76%
May-23	-13.49%	-1.40%	1.40%	32.16%	-8.07%	-7.66%

Jun-23	15.64%	5.64%	5.80%	18.99%	0.43%	-7.24%
Jul-23	19.07%	-0.98%	-1.30%	-14.44%	-2.92%	-1.08%
Aug-23	1.08%	-0.36%	-11.43%	-4.18%	-1.18%	-11.73%
Sep-23	-0.70%	0.86%	-1.00%	-23.76%	2.85%	-12.80%
Oct-23	-4.57%	-15.64%	-3.18%	-4.27%	2.15%	-1.28%
Nov-23	-6.57%	3.31%	-11.85%	17.04%	4.73%	-24.68%
Dec-23	0.49%	6.37%	1.61%	22.36%	-4.35%	1.15%
Jan-24	-6.45%	0.34%	2.41%	1.91%	4.37%	25.95%
Feb-24	-0.20%	-4.11%	24.76%	-11.19%	-3.60%	-4.96%
Mean	2.36%	0.36%	1.63%	7.53%	1.41%	-0.12%

Table 2. Mean return and standard deviation from August 2022 to February 2024.

	SLB	SNY	CRTO	AVDL	ORAN	EDAP
Mean	28.35%	4.36%	19.54%	90.33%	16.90%	-1.38%
StDev	46.13%	29.79%	30.44%	75.82%	20.59%	42.30%

4.3. Final Performance on the Stocks

The correlation matrix of the four selected stocks is displayed in Table 3. Furthermore, the weights of these stocks were calculated using Solver in Excel and are presented in Table 4. The objective for Solver was to find the solution with the highest Sharpe ratio, as a higher Sharpe ratio indicates a higher return relative to volatility risk.

Upon analysis, it was found that the return of the portfolio exceeds that of most individual selected stocks, while the standard deviation notably decreases. This suggests an improvement in risk-adjusted returns for the portfolio.

Table 3. Correlation of 4 selected stocks.

Correlations	SLB	CRTO	AVDL	ORAN
SLB	1			
CRTO	-0.069	1		
AVDL	0.131	0.120	1	
ORAN	0.185	0.009	0.329	1

Table 4. The result of the portfolio.

	SLB	CRTO	AVDL	ORAN	Return	StDev	Sharpe
MM weights	12.00%	11.53%	23.67%	52.80%	35.96%	21.60%	1.484

5. Conclusion

Negative screening is an important strategy in the ESG investing landscape, allowing investors to align their portfolios with their values and potentially reduce exposure to related risks. Negative screening is one of the easiest ways to make a portfolio for ESG investing and was widely used by investors. It has limitation and face challenges, such as data availability and accuracy. ESG investing is becoming popular these years, developing a recognized method to make an ESG portfolio becoming more important. ESG investing is suitable for mature markets, not developing countries. Some deep information for companies may be neglected during ESG negative screening. As there is no common consensus on ESG score mechanism, the score for the same stocks may be different from one organization to another. In general cases, negative screening is a comparatively easy way to make up an ESG portfolio.

Reference

- [1] JIN I. ESG-screening and factor-risk-adjusted performance: The concentration level of screening does matter [J]. *Journal of Sustainable Finance & Investment*, 2022, 12(4): 1125-45.
- [2] GIESE G, LEE L-E, and MELAS D, et al. Foundations of ESG investing: How ESG affects equity valuation, risk, and performance [J]. *The Journal of Portfolio Management*, 2019, 45(5): 69-83.
- [3] CERQUETI R, CICIRETTI R, DALÒ A, et al. ESG investing: A chance to reduce systemic risk [J]. *Journal of Financial Stability*, 2021, 54: 100887.
- [4] INSTITUTE C. Certificate in ESG Investing Curriculum [M]. Third Edition ed., 2021.
- [5] ECCLES R G, RAJGOPAL S, XIE J. Does ESG negative screening work? [J]. Available at SSRN 4150524, 2022.
- [6] LO A W. The statistics of Sharpe ratios [J]. *Financial analysts' journal*, 2002, 58(4): 36-52.
- [7] BODIE K, MARCUS. Investment [M]. Thirteenth Edition ed., 2024.
- [8] France's Total behind 'greatest environmental scandal' in Yemeni history: Report [Z]. *The Cradle*. 2023