# Corporate ESG Performance and Financial Market Performance

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## 1 Introduction and Motivation

ESG performance has become an important factor in corporate strategy and financial markets. Meta-analyses show that a majority of studies find a positive relationship between ESG scores. However, there is also a non-negligible share of research reports that report neutral or even negative effects. (Friede et al., 2015; Whelan et al., 2021) Our project focuses on Swiss companies to examine whether ESG scores are positively linked to financial performance.

Our research questions are therefore:

1. What is the relationship between ESG scores and financial performance for Swiss listed companies?
2. What is the effect of the industry type on this relationship, focusing on the top 5 industries in Switzerland?
3. If there is a clear dependency of ESG on financial performance, how do the individual effects of Environmental (E), Social (S), and Governance (G) factors compare in explaining this relationship?
4. How does the relationship between financial performance and ESG scores behave of Swiss companies compared to peers worldwide?

## 2 Methods

### 2.1 Data Acquisition

We collect data from two main company groups:

- Swiss companies listed in the Swiss Performance Index (SPI), which includes 201 companies across various sectors.
- U.S. companies from the S&P 500 Index as a global benchmark, which includes 503 leading listed companies.

For both datasets, financial and ESG data were retrieved via the Yahoo Finance API by company ticker. Since the API does not provide official documentation, we found two reliable public technical references (Ranaroussi's yfinance Documentation and the AlgoTrading101 API Guide) that we can consult to ensure data accuracy and consistency. We developed a Python script to extract data via the Yahoo Finance API. By modifying the input parameter (`swiss_companies.txt`

and `S&P_companies.txt`), we generated separate datasets for Swiss and S&P companies. The complete implementation can be found in the Code folder as data_acquisition.py.

Company tickers were ollected from Wikipedia (SPI, S&P 500), and for the SPI we validated the list against a real-time source from Investing.com (as of 2025-10-17). Mismatches were resolved via Excel's VLOOKUP and manual checks. Finalized tickers were stored in company_list.xlsx.

Variables collected cover company information, financial indicators, and ESG scores:

1. Company Information: name, ticker, country, sector, industry, currency.
2. Financial and Market data, including **Stock Price**, **Profitability Metrics** (Revenue, Net Income, Operating Margin, Gross Margin, ROE, ROA, Profit Margin, EBITDA Margin, and EPS), **Valuation Metrics** (Market Capitalization, P/E Ratio, P/B Ratio, and Annual Return), **Risk and Stability Metrics** (Beta, Debt-to-Equity Ratio, Current Ratio, and (Operating Cash Flow), **Revenue Growth**.
3. ESG Scores: Total ESG Score, Environmental / Social / Governance sub-scores, Highest Controversy, and ESG Performance Category.

All financial data correspond to a **2024-12-31** snapshot, ensuring alignment with the same reporting period as the ESG scores.

## 2.2 Data Cleansing

First, by checking the missing ESG data, we found that only 71/201 SPI companies had full ESG data and 142/201 had Total ESG Scores. To maintain sample size, we only removed firms without Total ESG Score. Then, we examined the country distribution to ensure dataset consistency. Since 5/201 SPI firms were non-Swiss, we removed them to maintain comparability. In the S&P 500 dataset, 96% were US-based, so non-US firms were also removed. We also checked and guaranteed that no overlap existed between SPI and S&P 500 companies. Besides, 1 duplicate (SCHN.SW vs. SCHP.SW) was resolved by keeping the registered share ticker, and a missing company name (Galderma) was manually filled in this part.

A few financial variables (e.g., ROE%, Beta, Revenue) contained sporadic missing values. To ensure consistency, we dropped variables with extensive missing data or redundancy.

After cleaning, we retained 134 Swiss companies (SPI) and 280 U.S. companies (S&P 500) for subsequent analysis.

For data type and range checks, numeric, categorical, and date columns were standardized. Value ranges were validated (e.g., ESG scores 0–100, controversy level 0–5). Given some companies have extreme margins and returns, out-of-range values were treated as warnings rather than removed.

Outliers were identified using the IQR method. Given the limited ESG sample size, we retained extreme values at this stage, as they may represent valid observations. Outlier treatment will be revisited during the analysis phase based on metric distributions.

Finally, we enriched the dataset with additional attributes and prepared it for analysis. A Company_Type column was added to distinguish between SPI and S&P 500 firms in the merged dataset. Companies were classified into 5 ESG Risk Categories (Negligible, Low, Medium, High, Severe) based on ESG Risk Ratings Methodology, where lower scores indicate lower risk.

After the SPI and S&P 500 datasets were merged, redundant columns with identical values were removed, and the cleaned combined dataset was saved as "Data/cleaned_combined_data.csv."

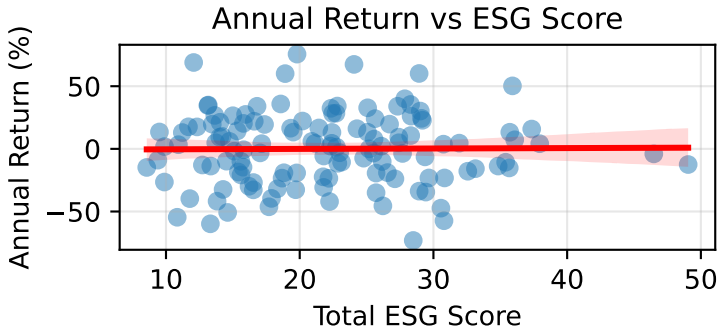
# 3 Results

## 3.1 RQ1: Relationship between financial performance and ESG

Firstly, we look at the dataset for the analysis more closely:

- The number of companies per industry reaches a maximum of 14, which is expected given the dataset of only 136 observations.
- ESG risk scores vary widely, from negligible to severe levels.
- The range of annual returns is also quite broad, with extreme outliers showing losses of up to -100% and gains exceeding +250%. We reviewed the outliers and excluded them for further analysis.

We create a scatterplot to analyse the relationship between ESG-risk and annual return visually:




The linear fit is horizontal which means that there is no effect of ESG risk on annual performance. This result implies that firms with stronger ESG do not systematically outperform or underperform peers in terms of annual stock returns. The broad confidence band further suggests that ESG factors alone have limited explanatory power for short-term returns.

Now we run a regression analysis to statistically disentangle the effects and control for these influencing factors:

- **Market capitalization** (log_mc): Larger firms are typically more diversified and stable, which can affect both their ESG performance and returns.
- **Revenue growth** (Revenue_Growth_Pct): Fast-growing firms may achieve higher returns regardless of ESG, so including growth helps isolate the ESG effect.
- **Industry**: ESG relevance differs by sector, so dummies control for these differences.

The adjusted R-squared shows that the model explains ~49% of the variance in annual returns.

Contrary to expectations from the visual analysis, the Total ESG Score has a statistically significant effect (coef = 0.91, p = 0.047), but in the opposite direction: higher ESG risk is linked to higher annual returns. The effect is small, with about a 0.9 percentage point increase in return per ESG-risk point.

Log market capitalization is highly significant (coef = 7.22, $p < 0.001$), indicating that larger firms tend to achieve higher returns, while revenue growth has no significant impact (coef = -0.03, p = 0.78).

### 3.2 RQ2: Effect of industry type on financial performance and ESG relationship for top 5 Swiss industries

Based on the regression results from RQ1, none of the industry coefficients are statistically significant. This means that, after controlling for firm size, revenue growth, and ESG risk, there are no clear industry-specific effects on annual returns. All industry coefficients show large standard errors and high p-values, suggesting that differences across industries are not robust or meaningful in this model.

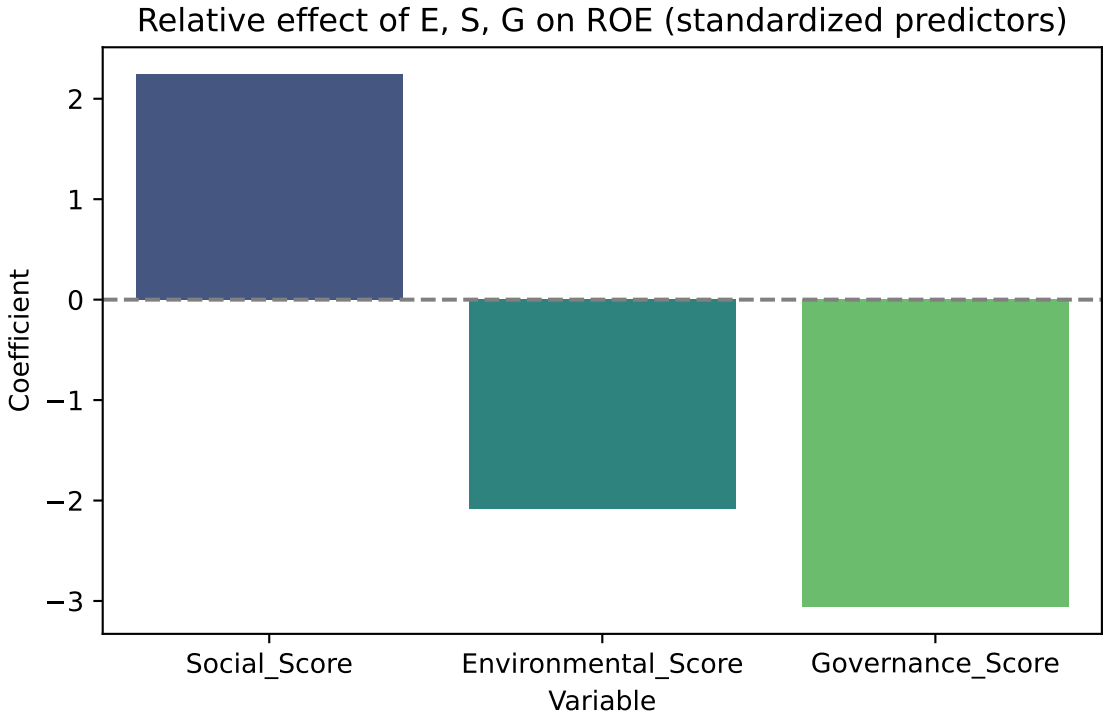
### 3.3 RQ3: ESG Subdimensions and Financial Performance

This section examines whether the Environmental (E), Social (S), and Governance (G) pillars are linked to companies' financial outcomes — measured by Return on Equity (ROE), P/E ratio, and Annual Return.

A correlation analysis shows that while E, S, and G scores are moderately correlated with each other (E–S = 0.76, S–G = 0.62), their relationships with financial indicators are weak or near zero. This suggests that ESG performance does not directly translate into stronger short-term financial results.

A multiple regression using ROE as the dependent variable confirms this pattern ($R^2 = 0.005$). None of the ESG components show statistically significant effects:

- Social: small positive coefficient (suggesting slightly higher profitability for socially engaged firms),
- Environmental and Governance: small negative effects.

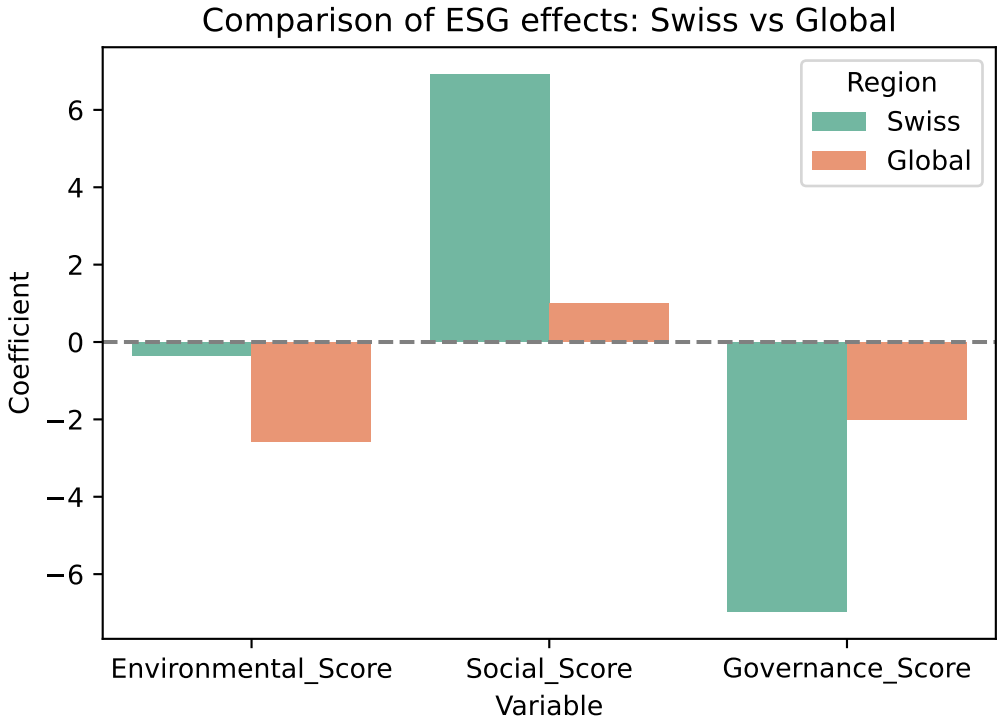



Although insignificant, the Social pillar consistently displays the most positive association, hinting that companies emphasizing social responsibility might experience marginal benefits. In contrast, stricter governance practices may correspond to slightly lower short-term returns.

Overall, ESG subdimensions explain less than 1% of ROE variation — indicating that ESG effects on profitability are weak or long-term rather than immediate.

### 3.4 RQ4: Swiss vs. Global Companies Comparison

To assess country differences, we compare correlations and regression coefficients between Swiss SPI and global (S&P 500) firms.




Both Swiss and global samples show strong correlations within ESG categories but weak connections to financial performance. Swiss companies exhibit a more pronounced positive Social effect and a stronger negative Governance effect, suggesting local institutional or cultural differences. However, none of these effects reach statistical significance.

### 3.5 Interpretation and Discussion

Across all analyses, ESG scores show strong internal consistency—the Environmental, Social, and Governance pillars correlate strongly with each other. However, their relationship with financial performance is generally weak, regardless of whether firms are Swiss or part of the global benchmark.

For both samples, correlations between ESG indicators and financial metrics (ROE, annual return) are close to zero. Regression models confirm this: none of the individual E, S, or G dimensions significantly explain profitability. The Social dimension tends to show the most positive associations, whereas Governance often displays small negative coefficients, but these effects remain statistically insignificant.

In comparing Swiss and global companies, the direction of relationships is broadly similar, though Swiss firms exhibit slightly stronger reactions—particularly a more positive association for Social scores and a more negative one for Governance. This suggests that local institutional and cultural

factors may amplify how certain ESG dimensions relate to financial outcomes, even if the overall explanatory power remains limited.

Overall, the empirical evidence indicates that ESG scores do not meaningfully predict short-term financial performance. Differences between countries or ESG subdimensions influence the magnitude but not the significance of these relationships.

## 4 Conclusion

This project explored the relationship between corporate ESG performance and financial outcomes, focusing on Swiss companies and comparing them to global peers. Using ESG and financial data from the Swiss Performance Index and S&P 500, we analyzed correlations and regression models.

*RQ1 - ESG and financial performance (Swiss companies):*
No strong or consistent link between ESG scores and short-term financial returns was found. A weak negative correlation between ESG risk and annual return suggested that higher ESG risk might correspond to marginally higher returns, though the effect was minimal.

*RQ2 - Industry effects within Switzerland:*
No significant industry differences were found when controlling for company size and growth. The ESG-performance relationship was weak and similar across sectors.

*RQ3 - ESG subdimensions (E, S, G):*
All components showed weak correlations with financial indicators. Social factors had the most positive but insignificant effect, while Governance and Environmental factors showed small negative impacts.

*RQ4 - Swiss vs. global companies:*
Swiss firms showed a slightly stronger positive link between the Social dimension and financial performance. Governance effects were more negative in Switzerland, possibly due to stricter governance standards.

*Overall Conclusion:*
ESG performance does not significantly drive short-term financial success. The relationship is weak, with the Social dimension showing the most promise for positive impact, especially in Switzerland. ESG benefits may be more visible in the long term, through reputation and stakeholder trust.

## 5 References

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, *5*(4), 210–233. https://doi.org/10.1080/20430795.2015.1118917

Whelan, T., Atz, U., & Clark, C. (2021). *ESG and financial performance. Uncovering the relationship by aggregating evidence from 1,000 plus studies published between 2015–2020.* https://www.stern.nyu.edu/sites/default/files/assets/documents/NYU-RAM_ESG-Paper_2021%20Rev_0.pdf

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