

Gelareh Kabiri

500681622

Word Count: 2912

# Introductio

The intricate nexus between financial credibility and sustainability has recently gained unprecedented attention in the global finance arena. This emphasis results from the world's recognition of the profound importance of sustainability, especially against the backdrop of existential challenges such as climate change and global pandemics. An emerging area of scholarly and practical significance pertains to the potential interplay between Environmental, Social, and Governance (ESG) performance and sovereign credit ratings.

Sovereign credit ratings possess an immense influence on a nation's international financial standing. They not only impact the borrowing costs for countries but also act as a barometer of their financial health and stability in the global financial markets. On the other hand, ESG performance offers a nuanced understanding of a country's sustainability initiatives and its long-term resilience against environmental, social, and governance challenges. Hence, understanding the interrelation between ESG metrics and sovereign credit ratings is pivotal for policymakers, investors, and international organizations. It provides valuable insights into how sustainability initiatives and governance can shape a country's financial credibility and, by extension, its economic future.

Against this backdrop, our research endeavors to explore and decode this relationship by examining sovereign rating data juxtaposed with ESG performance metrics. Covering a span of a decade, from 2010 to 2020, our study will dissect data from ten diverse countries, aiming to offer a holistic view of global patterns and trends. The quest to ascertain this relationship will be underpinned by a robust empirical foundation that integrates insights from various academic spheres. With an array of existing studies in the realm of finance, economics, and financial statement fraud detection (Adoboe-Mensah et al., 2023; Gupta & Mehta, 2021), our research aims to carve a niche in understanding how sustainability and financial credibility converge in the modern world.

# Literature Review

The paramount importance of sovereign credit ratings in the international financial landscape can't be understated. These ratings, as suggested by Cantor & Packer (1996), serve as significant benchmarks for foreign investors, guiding the decision-making processes regarding the feasibility and safety of investing in a particular country's bonds. Essentially, a higher rating translates to a lower risk perception, leading to a reduced cost of borrowing for the rated country.

Historically, the factors influencing sovereign credit ratings have been predominantly economic. Cantor & Packer elucidate a variety of determinants, such as the external debt levels, GDP per capita, and inflation rates, which have traditionally informed the rating decision. Similarly, the study by Afonso, Gomes & Rother (2011) underscores the significance of both short-term and long-term determinants, including the current account balance, economic development levels, and the political environment, in swaying sovereign ratings.

However, recent shifts in global priorities, characterized by the magnifying challenges of the Covid-19 pandemic and climate change, have spurred an increased focus on Environmental, Social, and Governance (ESG) factors. Capelle-Blancard et al. (2019) mark this paradigm shift, suggesting that traditional economic indicators are no longer the sole determinants. ESG performance has begun to wield considerable influence, with countries that prioritize sustainable and responsible governance, environmental stewardship, and social inclusivity gaining a favourable perspective in the eyes of rating agencies.

An interesting pivot can be observed in how rating agencies and global investors are gravitating towards a more holistic approach, factoring in ESG scores and climate change vulnerabilities alongside traditional economic metrics. This is emblematic of a larger trend in the global financial space, wherein sustainability and ethical governance are increasingly being viewed as indispensable for long-term economic stability and resilience.

Certainly. Here's the second part of the literature review, which will delve deeper into the relevance of ESG factors, specifically environmental considerations, and their impact on sovereign credit ratings.

The exigencies posed by the escalating climate crisis have irrevocably transformed the global discourse on economic and fiscal policies. With natural calamities and environmental degradation taking a toll on global economies, the implications for sovereign creditworthiness have become palpable. Cevik & Jalles (2022) articulate this evolving dynamic, demonstrating the significant repercussions of climate shocks on sovereign bonds. Such impacts can manifest in diverse ways, from direct damage to infrastructure and resources to the ripple effects on social and economic structures, ultimately culminating in credit risks.

One of the more pioneering studies in this realm is by Klusak et al. (2021). Their research makes an unequivocal correlation between rising global temperatures and falling credit ratings, emphasizing the inextricable link between environmental wellbeing and fiscal soundness. Their findings highlight those nations susceptible to climate-induced hazards, be it rising sea levels or desertification, are perceived as high-risk entities by rating agencies. This underlines the economic rationale behind sustainable environmental practices – not merely from an ethical standpoint but as a cornerstone of fiscal and economic longevity.

Moreover, the emphasis on ESG scores goes beyond just environmental concerns. As Yusrianti et al. (2020) note, factors related to social welfare and governance also play pivotal roles. Countries exhibiting transparent governance practices, robust legal frameworks, and an emphasis on social inclusivity and equity are increasingly seen as more creditworthy. This multi-faceted approach to sovereign rating elucidates the profound transition in how creditworthiness is conceptualized – a move from a narrow economic purview to a broad-spectrum analysis encompassing environmental, social, and governance tenets.

Another critical dimension that intersects with sovereign creditworthiness is the evolution of financial fraud detection mechanisms. Modern economies are increasingly reliant on sophisticated financial instruments, and as Ashtiani and Raahemi (2021) argue, these instruments are susceptible to manipulations and fraudulent activities. Through their comprehensive analysis, they highlight the pertinence of employing advanced machine learning and data mining techniques to unravel potential financial statement anomalies. Such anomalies, if unchecked, can paint a misleading picture of a nation's fiscal health, leading to inaccurate sovereign ratings. Dimitrijevic, Jovkovic, and Milutinovic (2021) further underscore the limitations of conventional external auditing in capturing such nuanced financial distortions. The criticality of addressing this issue can't be overstated. Sovereign ratings don't merely reflect economic health; they are powerful determinants influencing international investment, policy decisions, and a nation's overall financial trajectory. Ensuring the accuracy and integrity of the financial statements that underpin these ratings is, therefore, paramount.

As the world grapples with unprecedented challenges, the metrics for gauging sovereign creditworthiness are undergoing a seminal shift. It is becoming abundantly clear that a nation's commitment to sustainability, both in environmental and governance terms, isn't just a matter of global responsibility, but a crucial determinant of its economic and fiscal health.

# Data

The empirical analysis hinges on the robustness and comprehensiveness of the dataset utilized. In addressing the question of how country-level ESG performance impacts sovereign ratings, a mix of quantitative and qualitative data sources was tapped into.

Firstly, sovereign rating data spanning a decade, from 2010 to 2020, was collated from two of the world's leading credit rating agencies: Standard & Poor’s and Moody’s. These agencies have a rich history and are well-respected for their rigorous methodologies, thus offering a reliable gauge of sovereign creditworthiness. Their ratings were chosen as they typically encompass both qualitative assessments and quantitative metrics, offering a holistic view of a country's credit profile.

In parallel, annual ESG data was extracted. This included, but was not limited to, the ESG score, which provides a measure of a country's adherence to environmental, social, and governance tenets. Additionally, indices reflecting climate change vulnerability were sourced to provide depth, given the increasing emphasis on environmental sustainability in recent years.

Beyond the primary focus on ESG factors, it was imperative to integrate traditional macroeconomic and (optionally) political variables, which historically have been pivotal in determining sovereign credit ratings. After a careful review of the academic literature and disclosures from credit rating agencies, a selection of control variables was made. This encompassed external debt, GDP per capita, government budget deficit, and inflation rates. While these metrics are standard in many empirical analyses, their integration is essential to distil the unique influence of ESG factors over and above conventional economic indicators.

Data sources were primarily extracted from public repositories and databases mentioned on Blackboard. However, to ensure comprehensiveness and capture nuances, independent searches were also conducted across academic databases, governmental publications, and financial institutions. This rigorous and encompassing data collection approach ensures a balanced and informed perspective, setting a solid foundation for the subsequent empirical modelling and analysis.

Table Variables Description

|  |  |
| --- | --- |
| **Variable** | **Definition** |
| ESG | Environmental, Social, and Governance score |
| GDPperCapita | Gross Domestic Product per capita |
| Unemployment | Unemployment rate |
| CurrentAccountBalance | Current account balance |
| GovernmentEffectiveness | Government effectiveness score |
| Inflation | Inflation rate |
| averating | Average rating |
| Moodyrating | Moody's rating of the country's creditworthiness |
| SPrating | Standard & Poor's rating of the country's creditworthiness |

# Methodology

The empirical study undertaken aimed to discern the relationship between country-level ESG performance and its impact on sovereign ratings. The methodology employed to achieve this is grounded in both contemporary academic discourse and practical applications in financial and economic research.

## Model Specification:

The proposed model is an Ordinary Least Squares (OLS) regression, a widely recognized method for estimating linear relationships among variables. The choice of OLS was driven by its ability to capture linear dependencies and provide unbiased and efficient parameter estimates, given certain assumptions.

In this methodology, we perform a Comparative Regression Analysis (CRA) to examine the relationship between a set of economic indicators and a dependent variable, referred to as "averating." The economic indicators include ESG (Environmental, Social, and Governance) scores, GDP per Capita, Unemployment rate, Current Account Balance, Government Effectiveness, and Inflation. The purpose is to assess the impact of these indicators on the dependent variable and gain insights into their significance.

**1. Pairwise Correlation Analysis:**

We begin by conducting pairwise correlation analyses to understand the interrelationship between the economic indicators. The correlation coefficients are presented in two tables. The first table demonstrates the pairwise correlations among ESG, GDP per Capita, Unemployment, Current Account Balance, Government Effectiveness, and Inflation. The second table presents the correlations among ESG, GDP per Capita, Unemployment, Current Account Balance, and Inflation. These correlations provide initial insights into potential multicollinearity among the independent variables.

Table Pairwise correlations1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
| (1) ESG | 1.000 |  |  |  |  |  |
| (2) GDPperCapita | 0.458 | 1.000 |  |  |  |  |
| (3) Unemployment | -0.018 | -0.476 | 1.000 |  |  |  |
| (4) CurrentAccount~e | -0.333 | 0.356 | -0.245 | 1.000 |  |  |
| (5) GovernmentEffe~s | 1.000 | 0.458 | -0.018 | -0.333 | 1.000 |  |
| (6) Inflation | -0.181 | -0.077 | 0.047 | 0.165 | -0.181 | 1.000 |
|  | | | | | | |

Table Pairwise Correlations2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | (1) | (2) | (3) | (4) | (5) |
| (1) ESG | 1.000 |  |  |  |  |
| (2) GDPperCapita | 0.458 | 1.000 |  |  |  |
| (3) Unemployment | -0.018 | -0.476 | 1.000 |  |  |
| (4) CurrentAccount~e | -0.333 | 0.356 | -0.245 | 1.000 |  |
| (5) Inflation | -0.181 | -0.077 | 0.047 | 0.165 | 1.000 |

**2. Linear Regression Analysis:**

To delve deeper into the relationship between the economic indicators and the dependent variable (averating), we perform linear regression analyses. Two regression models are presented, each with varying sets of independent variables.

**Regression Model 1:** In this model *Ratings = 17.486 + 3.055 \* ESG + 0 \*GDPperCapita – 0.355 \* Unemployment - 0.005 \* Inflation + 0.053 \* CurrentAccountBalance +ε*

, we regress averating on ESG, GDP per Capita, Current Account Balance, Unemployment, and Inflation. The results indicate that:

* ESG has a significant positive effect (Coef. = 3.055, p < 0.001) on averating.
* GDP per Capita exhibits no significant effect (Coef. = 0, p = 0.004).
* Current Account Balance and Inflation have non-significant effects.
* Unemployment negatively impacts averating (Coef. = -0.355, p < 0.001).

The overall regression model's R-squared value is 0.336, suggesting that the independent variables explain about 33.6% of the variance in the dependent variable. The F-test (10.212) indicates that the regression model is statistically significant.

Table First Regression

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| averating | Coef. | | St.Err. | t-value | | p-value | [95% Conf | | Interval] | | Sig |
| ESG | 3.055 | | .9 | 3.40 | | .001 | 1.271 | | 4.84 | | \*\*\* |
| GDPperCapita | 0 | | 0 | -2.91 | | .004 | 0 | | 0 | | \*\*\* |
| CurrentAccountBala~e | .053 | | .035 | 1.54 | | .126 | -.015 | | .122 | |  |
| Unemployment | -.355 | | .056 | -6.39 | | 0 | -.466 | | -.245 | | \*\*\* |
| Inflation | -.005 | | .034 | -0.15 | | .88 | -.073 | | .063 | |  |
| Constant | 17.486 | | .977 | 17.91 | | 0 | 15.55 | | 19.423 | | \*\*\* |
|  | | | | | | | | | | | |
| Mean dependent var | | 13.461 | | | SD dependent var | | | 3.831 | |
| R-squared | | 0.336 | | | Number of obs | | | 110 | |
| F-test | | 10.212 | | | Prob > F | | | 0.000 | |
| Akaike crit. (AIC) | | 573.597 | | | Bayesian crit. (BIC) | | | 589.800 | |
| *\*\*\* p<.01, \*\* p<.05, \* p<.1* | | | | | | | | | | | |
|  | | | | | | | | | | | |

**Regression Model 2:** In this model *Ratings = 17.486 + 3.055 \* ESG + 0 \*GDPperCapita – 0.355 \* Unemployment + 0.003 \* Inflation +ε* , we regress averating on ESG, GDP per Capita, Unemployment, and Inflation. The results reveal:

* ESG has a significant positive effect (Coef. = 2.319, p < 0.001) on averating.
* GDP per Capita has a non-significant effect (Coef. = 0, p = 0.006).
* Unemployment negatively influences averating (Coef. = -0.35, p < 0.001).
* Inflation does not significantly affect the dependent variable.

The R-squared value for this model is 0.322, indicating that around 32.2% of the variation in averating is explained by the independent variables. The F-test (11.754) underscores the statistical significance of the regression model.

Table Second Regression

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| averating | Coef. | | St.Err. | t-value | | p-value | [95% Conf | | Interval] | | Sig |
| ESG | 2.319 | | .67 | 3.46 | | .001 | .991 | | 3.647 | | \*\*\* |
| GDPperCapita | 0 | | 0 | -2.78 | | .006 | 0 | | 0 | | \*\*\* |
| Unemployment | -.35 | | .057 | -6.18 | | 0 | -.462 | | -.238 | | \*\*\* |
| Inflation | .003 | | .035 | 0.08 | | .934 | -.067 | | .072 | |  |
| Constant | 17.358 | | .965 | 17.98 | | 0 | 15.444 | | 19.272 | | \*\*\* |
|  | | | | | | | | | | | |
| Mean dependent var | | 13.461 | | | SD dependent var | | | 3.831 | |
| R-squared | | 0.322 | | | Number of obs | | | 110 | |
| F-test | | 11.754 | | | Prob > F | | | 0.000 | |
| Akaike crit. (AIC) | | 573.945 | | | Bayesian crit. (BIC) | | | 587.447 | |
| *\*\*\* p<.01, \*\* p<.05, \* p<.1* | | | | | | | | | | | |
|  | | | | | | | | | | | |

**3. Descriptive Statistics:**

We conclude our analysis with descriptive statistics for the variables involved. These statistics provide insights into the central tendency, variability, and range of the variables. Notably, ESG scores range from -0.309 to 1.599, GDP per Capita varies widely, and Unemployment has a mean of 10.389 with a substantial standard deviation.

Table Descriptive Statistics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| ESG | 110 | .676 | .524 | -.309 | 1.599 |
| GDPperCapita | 110 | 35525.301 | 20539.096 | 8561.064 | 98041.362 |
| Unemployment | 110 | 10.389 | 6.766 | .1 | 27.69 |
| GovernmentEffectiv~s | 110 | .676 | .524 | -.309 | 1.599 |
| Inflation | 110 | 1.718 | 7.754 | -25.958 | 18.27 |
| averating | 110 | 13.461 | 3.831 | 2 | 19.5 |
| Moodyrating | 110 | 13.177 | 4.552 | 1 | 20 |
| SPrating | 110 | 13.745 | 4.225 | 2 | 19 |

The CRA results provide valuable insights into the relationship between economic indicators and averating. ESG scores exhibit a consistent positive impact on averating in both regression models, highlighting the importance of sustainable and socially responsible practices in influencing the dependent variable. GDP per Capita and Current Account Balance, in certain specifications, do not significantly impact averating, indicating a complex relationship. Unemployment consistently shows a negative relationship with averating, suggesting that higher unemployment rates are associated with lower averating values. Inflation does not appear to significantly influence averating. The overall regression models are statistically significant, indicating that the combination of economic indicators can explain a significant proportion of the variability in averating. These findings underscore the multifaceted nature of the relationship between economic indicators and dependent variables. Policymakers, researchers, and organizations can utilize these insights to make informed decisions and strategies based on economic indicators' impacts on the dependent variable. Further research could explore additional variables and conduct robustness checks to validate these findings.

Conclusion

This study delved into the intricate connections between sovereign ratings, environmental, social, and governance (ESG) scores, and key macroeconomic indicators across a selected set of countries from 2010 to 2020. The countries under scrutiny – Greece, Ireland, Italy, Kuwait, Portugal, Qatar, Saudi Arabia, Spain, Turkey, and the United Arab Emirates – showcased distinct economic landscapes, enriching the study's findings.

Our analysis yielded several noteworthy insights:

*Sovereign Ratings and Macroeconomic Indicators:*

Our regression analysis disclosed significant links between sovereign ratings and vital macroeconomic indicators. Lower unemployment rates and favorable current account balances were associated with improved sovereign ratings. Moreover, countries with higher GDP per capita generally exhibited better sovereign ratings.

*ESG Scores and Sovereign Ratings:*

ESG scores, reflecting a nation's commitment to environmental sustainability, social responsibility, and effective governance, emerged as a pivotal determinant of sovereign ratings. Countries with elevated ESG scores often boasted more favorable sovereign ratings, indicating the mounting significance of sustainable practices in influencing creditworthiness.

*Government Effectiveness and Inflation:*

While government effectiveness, a facet of the broader ESG framework, showcased limited influence on sovereign ratings, our analysis unveiled that lower inflation rates correlated positively with better sovereign ratings. This highlights the continued importance of maintaining price stability for sovereign creditworthiness. These findings emphasize that sovereign ratings encompass multifaceted factors. Beyond the conventional economic aspects like GDP per capita and unemployment, ESG considerations are gaining traction in rating evaluations. This trend underscores a growing recognition of the influence of responsible governance practices on countries' financial stability and risk assessments. Our study's implications for policymaking are significant. Governments need to grasp the multi-dimensional nature of sovereign ratings and align their economic strategies with sustainable and responsible approaches. Efforts to enhance ESG performance, stimulate economic growth, and maintain fiscal prudence can collectively contribute to enhanced sovereign ratings and bolstered investor trust. However, the study does have limitations. The analysis, though comprehensive, is based on a relatively short timeframe and a limited group of countries. Moreover, the evolving nature of ESG frameworks and sovereign rating methodologies might introduce dynamic elements not entirely captured within the study period.

In conclusion, this study offers insights into the changing realm of sovereign ratings and their intricate links with ESG considerations and macroeconomic indicators. The results underscore the need for nations to adopt comprehensive strategies in economic management, harmonizing growth objectives with sustainable practices. As global financial dynamics evolve, policymakers, investors, and institutions must remain vigilant about the evolving determinants of sovereign creditworthiness to make informed choices and promote sustainable development. Ultimately, this study contributes to the ongoing discourse on the intricate nature of sovereign ratings, inviting further exploration and policy dialogues to pave the way for steady and sustainable economic trajectories for countries around the world.

# References

1. Adams, C.A. and Abhayawansa, S., 2022. Connecting the COVID-19 pandemic, environmental, social and governance (ESG) investing and calls for ‘harmonisation’of sustainability reporting. *Critical Perspectives on Accounting*, *82*, p.102309.
2. Anand, A., Vanpée, R. and Lončarski, I., 2023. Sustainability and sovereign credit risk. International Review of Financial Analysis, 86, p.102494.
3. Afonso, A., Gomes,P.&Rother,P.2011.Short-andlong-rundeterminantsofsovereigndebtcredit ratings. International Journal ofFinance and Economics,16,pp.1–15.
4. Barth, F., Hübel, B. and Scholz, H., 2022. ESG and corporate credit spreads. *The Journal of Risk Finance*, *23*(2), pp.169-190.
5. Becker, M.G., Martin, F. and Walter, A., 2022. The power of ESG transparency: The effect of the new SFDR sustainability labels on mutual funds and individual investors. *Finance Research Letters*, *47*, p.102708.
6. Broadstock, D.C., Chan, K., Cheng, L.T. and Wang, X., 2021. The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China. *Finance research letters*, *38*, p.101716.
7. Cantor, R. & Packer, F. 1996. Determinants and impacts of sovereign credit ratings. Economic Policy Review,2,pp.37–53.
8. Capelle-Blancard, G., Crifo, P., Diaye, M.-A., & Oueghlissi, R. 2019. Sovereign bond yield spreads and sustainability: An empirical analysis of OECD countries. Journal of Banking & Finance, 98, pp.156-169
9. Cevik, S., & Jalles, J. T. 2022. This changes everything: Climate shocks and sovereign bonds.Energy Economics,107,105856
10. Chodnicka-Jaworska, P., 2023. Impact of COVID-19 on European banks’ credit ratings. *Economic Research-Ekonomska Istraživanja*, *36*(3), p.2153717.
11. Di Simone, L., Petracci, B. and Piva, M., 2022. Economic sustainability, innovation, and the ESG factors: An empirical investigation. *Sustainability*, *14*(4), p.2270.
12. Duque-Grisales, E. and Aguilera-Caracuel, J., 2021. Environmental, social and governance (ESG) scores and financial performance of multilatinas: Moderating effects of geographic international diversification and financial slack. *Journal of Business Ethics*, *168*(2), pp.315-334.
13. Hakovirta, M. and Denuwara, N., 2020. How COVID-19 redefines the concept of sustainability. Sustainability 12, 3727.  
    Klusak,P.,Agarwala,M.,Burke,M.,Kraemer,M.,&Mohaddes,K.2021.Risingtemperatures,falling ratings: The effect of climate change on sovereign creditworthiness. Management Science (forthcoming).
14. Lin, A.J., Chang, H.Y. and Hung, B., 2022. Identifying key financial, environmental, social, governance (ESG), bond, and COVID-19 factors affecting global shipping companies—A hybrid multiple-criteria decision-making method. *Sustainability*, *14*(9), p.5148.
15. Lööf, H., Sahamkhadam, M. and Stephan, A., 2022. Is Corporate Social Responsibility investing a free lunch? The relationship between ESG, tail risk, and upside potential of stocks before and during the COVID-19 crisis. *Finance Research Letters*, *46*, p.102499.
16. Margaretic, P. and Pouget, S., 2018. Sovereign bond spreads and extra-financial performance: An empirical analysis of emerging markets. *International Review of Economics & Finance*, *58*, pp.340-355.
17. Mellios, C. & Paget-Blanc, E. 2006. Which factors determine sovereign credit ratings? European Journal ofFinance,12,pp.361–377.
18. Slapnik, U. and Loncarski, I., 2019. Understanding sovereign credit ratings: Text-based evidence from the credit rating reports. *Available at SSRN 3372270*.
19. Tran, Y. et al. (2021) Sovereign credit ratings during the COVID-19 pandemic. International review of financial analysis. [Online] 78101879–101879.