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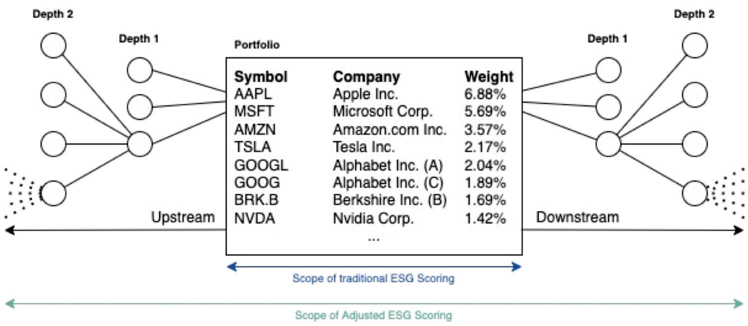
Towards Supply Chain Adjusted ESG Scores

Problem - The increasing complexity of global supply chains has led companies to organize themselves into tightly interconnected business networks in which the existence of these companies largely depends on the business activity conducted between them. Consequently, when assessing a company's environmental, social and governance (ESG) impact, the indirect impact of activities that take place throughout the supply chain must be taken into consideration.



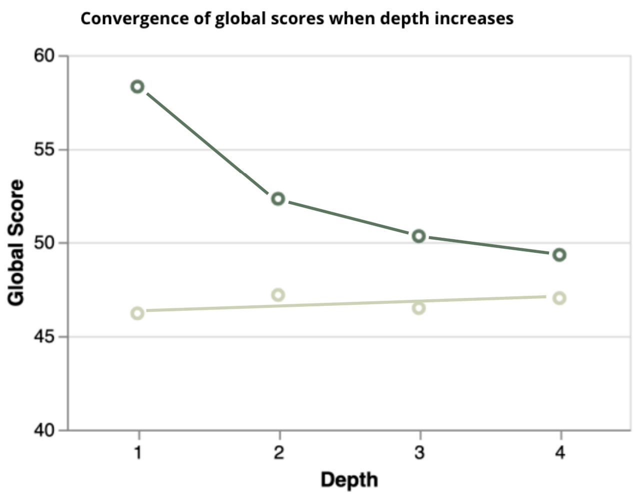
Methodology - Two real-world portfolios from a leading asset management company were considered. One ESG portfolio and one non-ESG portfolio. The ESG impact of both portfolios was assessed based on the traditional ESG scores and supply chain adjusted ESG scores.

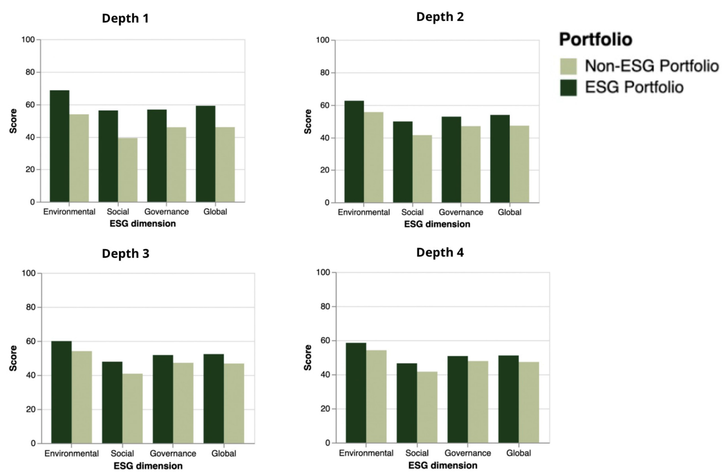
ESG Scoring adjustment based on supply chain information

As the depth of the supply chain taken into consideration increases, the negative impact of the adjustments also increases which results in the global adjusted ESG scores of the ESG portfolio and the non-ESG portfolio becoming increasingly similar.

$$\text{ESG}_{\text{portfolio},j} = \sum_{i=1}^{n} \frac{\text{Market Value}_i}{\text{Total Market Value}} \text{Supply Chain ESG}_{i,j}$$

$$\text{Supply Chain ESG}_j = \sum_{k=1}^{m} \frac{e^{-a*\text{depth}_k}}{\sum_{l=1}^{m} e^{-a*\text{depth}_l}} \text{ESG}_{k,j}$$





Conclusion – The results suggest that incorporating supply chain information in ESG assessments differently affects different portfolios. The ESG portfolio had a strong negative correction (-19%) in its ESG scores whereas the non-ESG portfolio remained largely unaffected.