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ESG factors and risk-adjusted performance: a new quantitative model

N. C. Ashwin Kumar[a], Camille Smith[a], Leïla Badis[a], Nan Wang[a], Paz Ambrosy[a] and Rodrigo Tavares[b]

[a]IE Business School, Madrid, Spain; [b]Granito & Partners

ABSTRACT
Conventional finance wisdom indicates that less risk leads to lower returns. Against this belief, new mathematical analysis, introduced in this article, demonstrates that companies that incorporate Environmental, Social and Fair Governance (ESG) factors show lower volatility in their stock performances than their peers in the same industry, that each industry is affected differently by ESG factors, and that ESG companies generate higher returns. The study assessed, for a period of 2 years, 157 companies listed on the Dow Jones Sustainability Index and 809 that are not.

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Corporate responsibility; ESG; responsible investment; social finance

1. Introduction

It is commonsense that the integration of Environmental, Social and Fair Governance (ESG) practices makes a company less vulnerable to reputation, political and regulatory risk and thus leading to lower volatility of cash flows and profitability. Doing the right things means you are less exposed in the long run.

In recent years we saw a flurry of publications demonstrating the positive financial performance of sustainable investments – those that generate social or environmental impacts alongside financial returns. Although this is positive progress, more work is necessary on the primary link between ESG and risk. Is there a difference in the average of the standard deviation of stocks prices of ESG positive companies vis-à-vis non-ESG stocks? Is it possible to quantitatively demonstrate this difference, and establish that ESG firms bear less risk compared to non-ESG stocks? And, critically, since lower risk has traditionally meant lower financial returns, how can ESG investment really be a viable investment strategy?

This article aims to demonstrate the importance of ESG factors to investors by using a new quantitative model to show evidence of the link between ESG factors and investment risk-adjusted performance. In the long term, we hope this paper drives more research to this topic, which will promote better overall investment decisions in addition to increased attention and efforts to build a better ESG society.

CONTACT Rodrigo Tavares rodrigo.tavares@granitopartners.com

2. Literature review

Recent studies on the financial performance of sustainable investments (Deutsche Bank 2012; Eccles, Ioannou, and Serafeim 2012; Borgers et al. 2013; Allianz Global Investors 2015; Cambridge Associates and the Global Impact Investing Network 2015; Mercer and LGT Capital Partners 2015; Morgan Stanley 2015; Eccles, Verheyden, and Feiner 2016; Khan, Serafeim, and Yoon 2015) somehow overlook the issue of risk. They matter-of-factly take the nexus 'high ESG-less risk' as granted and leapfrog to demonstrate improved financial, portfolio and stock performance where ESG factors are analytically applied. Interestingly, some of them actually underline that ignorance of ESG criteria could violate pension funds' fiduciary risk management duties. But by focusing on the idea that ESG principles can help deliver what everyone wants: superior, risk-adjusted performance over the long term, they overlook the importance of dissecting the impact of ESG on risk, even if, as the Cambridge Associates and GIIN report claims, 'Credible data *on risk* and return can help both existing and future impact investors better identify strategies that best suit their desired social, environmental and financial criteria' (our italics).

The only exceptions are Morgan Stanley (2015) – that finds that sustainable mutual funds had equal or higher median returns and equal or lower median volatility for 64% of the periods examined over the last 7 years compared to their traditional counterparts – and Eccles, Ioannou, and Serafeim (2012) that concluded that the portfolio of companies that have adopted a substantial number of environmental and social policies for a significant number of years exhibits lower volatility (1.43% and 1.72% on a value-weighted and equal-weighted base) than a non-ESG portfolio (1.72% and 1.79%, respectively).

Yet, for the sustainable investing ecosystem to mature and go mainstream, investment analysts will likely demand more quantitative work on ESG and standard deviation of stocks returns. This is what encouraged professors and MBA graduates from the IE Business School in Madrid to collaborate with Granito & Partners (G&P), an impact business consulting firm, to develop the ESG risk-premium model. An endeavor that started as a study conducted within the framework of the MBA program with support from G&P, it gradually incorporated additional IE and G&P's resources.

3. Data and methodology

3.1. ESG risk-premium model

This new quantitative model is designed to establish the correlation between ESG performance and volatility of stock returns. We relied upon the Dow Jones Sustainability Index [DJSI], one of the oldest and most recognized indices in the field of ESG, to identify 157 companies that have good ESG performance. To contrast, and in order to bring statistical significance to the results, we randomly selected a greater number of companies – 809 of them – that are not listed on the DJSI. These companies can be considered representative of average market performance. The larger population of reference stocks ensures that the average returns and standard deviations of the stocks are skewed towards the average in the market, even if there are a few stocks with high ESG performance within the population. The populations are of different sizes because the use of a

smaller reference portfolio for the market average would make this skew difficult to identify. Additionally, there are limited stocks with trackrecords on the DJSI.

Our ESG Population of stocks is really the top of the top when it comes to ESG practices; in other words, they are the 'best-in-class'. The DJSI selects index companies through an independent research firm, RobecoSAM, who conducts its Corporate Sustainability Assessment. This assessment is based upon primary evidence and is rules-based. To be included on the index, RobecoSAM invites companies across the world to be analyzed. From these invitations, companies will agree to be analyzed either from completing a questionnaire of RobecoSAM or from publically available information. RobecoSAM then selects the very top ESG performers compared to the company's industry benchmark. As a further check, a company is only eligible for selection if its score is at least 40% of the highest score within the respective index universe and if it is within the 10% best companies per industry. Thus, if a company is good enough to be on the DJSI, it is the very top of ESG performers relative to peers. So, even if a non-DJSI company has good ESG practices and is in our reference portfolio, our results would not be negatively affected because companies listed on the DJSI are indicative of the best in terms of ESG performance.

As the materiality of the ESG factors is highly related to the industry in which the firm operates, we grouped equity stocks into 12 industries. The industry-specific sustainability portfolios were built by equally weighting all stocks within each index to eliminate bias caused by any single stock with large market capitalization. Similarly, equally weighted reference portfolios were built using randomly weighted stocks.

As long-term performance tends to be skewed by a number of factors outside of ESG factors, thus making it difficult to prove that our hypothesis is due to only ESG factors from long-term performance indicators, we chose short-term indicators: weekly stock returns and volatility as they are most relevant to the study. A key distinction of our model is that it is a *market-based approach,* based upon real, historical stock price returns. It removes subjectivity, as it is not reliant upon any significant assumptions on future performance of the stocks. In other words, there is minimal human input or integration in this analysis.

For each industry, companies are chosen from the sustainability index considering the geographic location and level of market development: developed versus emerging. We have analyzed the annualized weekly returns and the annualized volatility of the weekly returns over a period of 2 years from 1 January 2014 to 31 December 2015 to provide statistically significant data points.

4. Results and discussion

4.1. ESG companies show lower volatility in their stock performances than their peers in the same industry

In our model the different degrees of risk in the equity stocks are reflected through the volatilities (annualized) of their stock returns. In all 12 industries studied, the group of ESG listed companies show lower stock return volatility in comparison to the reference companies – on average by 28.67% less (see Figure 1). This lower volatility means that companies that perform better in ESG factors exhibit less risk than the rest of companies

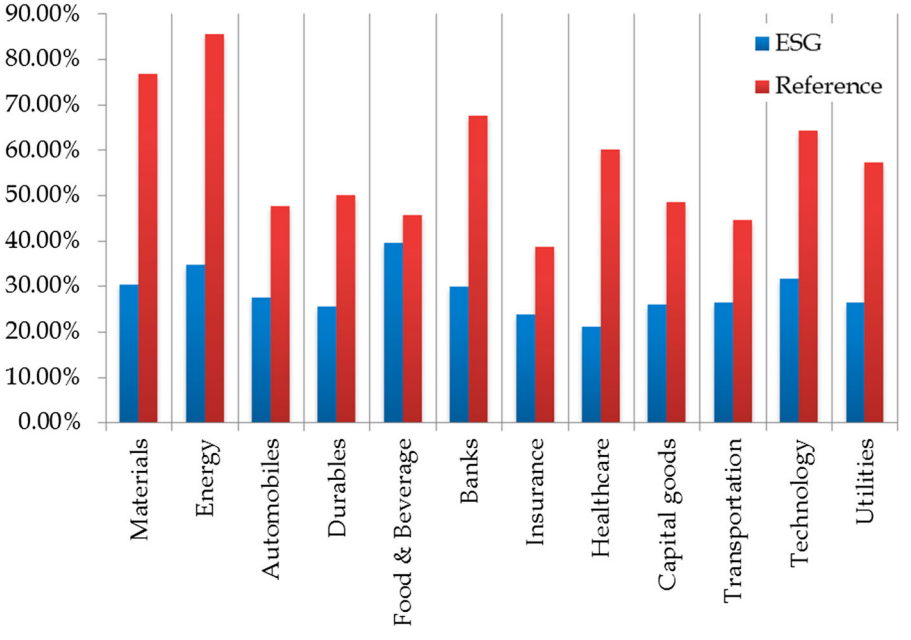

Figure 1. Annualized volatility comparison between ESG and reference companies.

in the same industry. Among all the industries studied, it seems that ESG factors have stronger impact in the industries of materials, banking, energy and technology. The difference ranges from 6.10% (for food and beverage) to as much as 50.75% (in the case of the energy industry). This difference of percentage is a *risk premium* that the other (reference or non-ESG) companies face and that investors should take into consideration when making investment decisions. Equity investments in non-ESG companies in these industries could bear as much as 28% or more risk on an annual basis than investments in ESG companies of the same industry on average.

4.2. Each industry is affected differently by ESG factors

We now know that industry results change with and without ESG practices. Examining even closer, we can also determine that ESG factors affect various industries to a greater or lesser degree as well. Further, the differences in volatilities among the 12 industries studied are much more pronounced in the group of non-ESG companies than in the ESG ones. Combining this all together, we can say that positive ESG practices could help companies reduce risk, although in varied amounts, based upon the characteristics or particularities of the industry itself (Figure 1).

For example, in the reference group, we can see that the difference between the most volatile industry (Energy) and the least volatile one (Insurance) is very significant (approximately 47%). However, if we look at these same two industries in the ESG group, we find that the volatility of the two industries is much more similar (difference of only 11% compared to 47%). So, considering ESG factors when investing in Energy could help reduce significant potential risk in this industry. Therefore, different industries

are affected differently by ESG factors and the degree to which they are impacted could serve as stronger guidance in industries for which ESG factors have greater bearing.

4.3. Lower risk, but higher return

In contrast to conventional thinking in which lower risk means lower return, our model showed that even with a lower risk, the investment could achieve a higher equity return. The majority of the industries that we studied (8 out of 12) resulted in better returns for ESG companies than their peers – ranging from 2.25% to 31.84% higher (see Figure 2). Across all 12 industries, the positive effect on equity return is 6.12% higher for ESG companies, on average. And, if we only look at the eight industries with clearly higher ESG returns, this difference jumps to an average 14.08% for ESG companies compared with their peers. The industries of energy, food & beverage and healthcare show the highest advantage regarding the positive impact of good ESG practices on the stock return (lower risk and higher return). However, negative impact of ESG factors on return is found in automobiles, durables, banking and insurance industries. A possible explanation for the energy industry can be the existence of the oil and gas energy. Most oil and gas companies do not operate in an environmentally sustainable fashion. However, this sort of operation is currently prominent and is often rewarded with superior cash flows. A similar analysis can be made for banks, as companies in the banking industry have

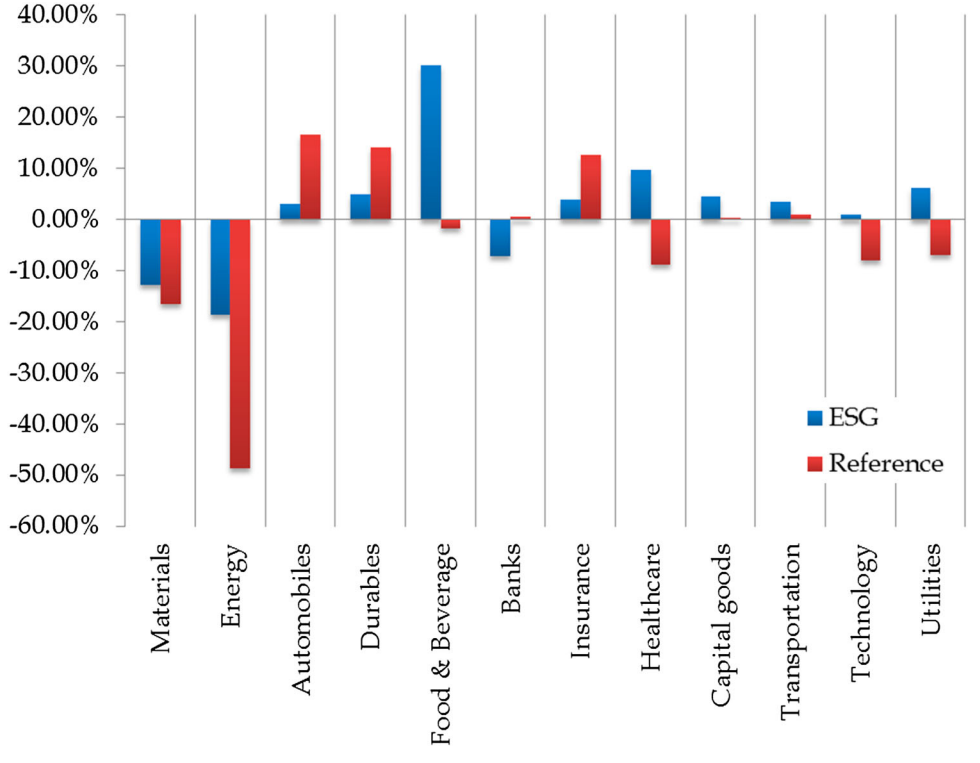

Figure 2. Annualized return comparison between ESG and reference companies.

been known for operating in a socially unsustainable fashion; these practices can often generate short-term rewards.

Combining the two sides of investing – risk and return – we found that the relationship between the two may not actually reflect traditional market thinking. The lower risk brought by better ESG practices may actually improve the risk-adjusted return of the investments in these companies. In today's world, just as a business can no longer excel in isolation from a thick web of stakeholders, so too investors must think in a more comprehensive fashion. The original equation of higher risk – higher return has not considered those constant internal and external interactions. Our Risk-Premium model does include these interactions and *uncovers hidden value* of ESG investments.

The argument is *not* about lower risk–lower returns, but rather about lower risk for the same or higher returns: a higher *risk-adjusted return.* A popular measure for comparing risk-adjusted returns is the 'Sharpe ratio', calculated as the expected return per unit volatility (risk) – higher the Sharpe ratio, the greater the efficiency of the investment. An analysis of the stock returns and volatility during January 2014 to December 2015, reveals that integration of ESG factors can significantly improve the efficiency of investment decisions.

As can be seen from Figure 3, the Sharpe ratio for ESG stocks in every industry, with the exceptions of the materials, energy and banking industries, is greater than those of the reference stocks in the respective industries – on average by 7.67%. Essentially, investors would have been able to earn higher than average return for each unit of risk taken on their investment if they had invested in ESG stocks. For example, an investor wanting to limit the annual volatility of investments to 50% would have earned an annualized return of 1.05% investing in Transportation companies from the reference companies list. Alternatively the investor would have earned 6.61% investing in ESG companies in the same sector. These higher Sharpe ratios are indicative of similar results that could be achieved by specifically investing in stocks with good ESG performance.

Another common measure of risk-adjusted return is the Treynor ratio. This measure compares the return earned on a stock against the beta or market risk of a stock as an alternative risk measure to standard deviation. Accordingly, stocks are selected from various geographies to compute the Betas for each stock. An example index is the MSCI world index, which covers 23 different geographic markets.

		ESG				Reference			
#	Industry	Expected Returns	Volatility	Sharpe	Treynor	Expected Returns	Volatility	Sharpe	Treynor
1	Materials	-12.85%	30.30%	-31.91%	127.84%	-16.53%	76.73%	-20.35%	27.78%
2	Energy	-18.66%	34.77%	-44.38%	-11.11%	-48.58%	85.52%	-72.80%	-63.20%
3	Automobiles	3.05%	27.56%	9.42%	-0.52%	16.66%	47.68%	39.40%	82.28%
4	Durables	4.87%	25.55%	24.97%	8.90%	14.03%	50.09%	23.45%	45.51%
5	Food & Beverage	30.14%	39.50%	27.82%	71.14%	-1.70%	45.60%	22.62%	21.58%
6	Banks	-7.25%	29.80%	-15.96%	-2.92%	0.55%	67.63%	3.48%	24.03%
7	Insurance	3.96%	23.78%	26.34%	-1.81%	12.65%	38.67%	24.11%	-4.98%
8	Healthcare	9.67%	21.12%	57.13%	24.90%	-8.89%	60.03%	1.67%	8.62%
9	Capital goods	4.45%	25.99%	19.94%	5.80%	0.36%	48.53%	-0.34%	-10.84%
10	Transportation	3.48%	26.33%	25.38%	9.07%	0.93%	44.56%	9.24%	1.98%
11	Technology	1.02%	31.66%	4.89%	1.24%	-7.97%	64.35%	-2.13%	-30.75%
12	Utilities	6.15%	26.32%	43.23%	31.37%	-6.88%	57.31%	26.45%	20.21%

Figure 3. Summary of detailed model results.

Similar results from our risk-premium model are noted in the case of the Treynor ratio measure as well. ESG stocks exhibit superior Treynor ratios over their reference counterparts in 9 out of 12 industries. The difference, on average, of Treynor ratios for ESG companies and reference Companies are 11.81% (Figure 3). The three exception industries are two of the same from the Sharpe ratio Analysis – automobile and banking. Additionally, the durables industry is an exception to our results.

Even in the case of the both Sharpe and Treynor ratio exceptions (Automobiles, Durables and Banking), our analysis exhibits that ESG stocks are still less volatile by 20.12%, 24.54% and 37.83%, on average. Therefore, ESG stocks tend to be less risky and more efficient vehicles for investments.

5. Conclusions and further research

Our model shows evidence that stock performance is closely linked with ESG factors. ESG factors bring lower volatility and therefore lower risk, and consequently higher risk-adjusted returns.

With the recent volatility in global stock markets, low-volatility investments are increasingly relevant. Although traditional analysis assumes that lower volatility translates into lower returns, integrating ESG factors into the investment decision can provide superior risk-adjusted returns and is specifically relevant for improving efficiency of low-risk investment strategies such as those followed by pension funds.

The study of ESG factors and their relevance to performance of investments is a relatively recent phenomenon and requires further research. Most studies that exist focus upon how to define and evaluate ESG factors and their impact on stock returns and tend to overlook the impact of ESG factors on the volatility of stocks. Also, they are centered on complex investment vehicles such as private equity funds or mutual funds. The two studies highlighted earlier, which also integrate a risk analysis, similarly indicate a positive correlation between ESG and lower volatility. But our methodology is fairly different. In a positive way, the Morgan Stanley study addresses long time horizons but it assesses only mutual funds and Separately Managed Accounts and solely in the United States, whereas we assessed directly publicly listed equity stocks. And it seemed more apposite in our view to use the DJSI as an ESG benchmark rather than MSCI 400 KLD Social Index given its worldwide coverage. In addition, neither Morgan Stanley (2015) nor Eccles, Ioannou, and Serafeim (2012) dissected the particularities of different industries. As we have shown, industries react different to ESG integration and it is not necessarily wise to treat them by the same token.

Our study research attempts to evidence that efficient investment strategies can be developed around listed equity stocks that perform well in terms of ESG factors. By analyzing stocks industry-wise this research can be of use to retail as well institutional investors. Our further work will expand the current model to include even longer time horizons, control for the size and geography of companies, and account for other ESG performance benchmarks beyond the DJSI. It would also be important to delve deeper into the robustness of the model by performing quartile and percentile analyses on the existing dataset, to ensure the results are applicable across the selected population. Even so, with the basic relationship between ESG factors and risk-adjusted returns established, we are one step

closer to developing investment strategies that provide superior returns and promote investment in sustainable assets.

Notes on contributors

N. C. Ashwin Kumar has developed his career in management and finance with Deloitte and is currently working with the research and analytics firm, Tracxn Technologies, both in India. He holds a Fellow Chartered Accountants (FCA) from the Institute of Chartered Accountants of India and also has an MBA from the IE Business School, Madrid.

Camille Smith is the owner and founder of reVive Consulting+, a boutique profitability and growth advisory firm. She has over eight years of investment management experience, and holds an MBA from the IE Business School in Madrid, Spain, where she was awarded the Dean's List Merit for finishing as Top 5% of the graduating class.

Leïla Badis has over a decade of international experience in developmental aid policy. She holds an MBA from the IE Business School, a Master in International Relations from Sciences-Po Paris, as well as a Master in History of Art from University Paris 1 Panthéon-Sorbonne.

Nan Wang has significant professional experience in the finance sector. She worked several years in Banco Bilbao Vizcaya Argentaria (BBVA), in Spain and Hong Kong, dealing with analysis and project management. She currently works in Commonwealth Bank of Australia, in Shanghai, as a project manager. She holds a Master in Economics from the University of Castile-La Mancha and an MBA from the IE Business School.

Paz Ambrosy is both a Professor of Private Equity and the Corporate Partners Director at the IE Business School. She also serves as the Managing Partner and Founder of Global Institutional Investors (GII). Graduated in Law by the Autónoma University in Madrid, she received her MBA from the IE Business School.

Rodrigo Tavares is the Founder and CEO of Granito & Partners, an impact business international consulting firm. He holds over 15 years of experience in government and international organizations working with foreign affairs and economic cooperation. His academic path includes the universities of Harvard (Senior Research Fellow), Columbia (Research Fellow on a postdoc grant), Gothenburg (Ph.D.) and California, Berkeley (Visiting Research Fellow).

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