

ESG & Factor Investing: a new stage has been reached

ESG Investing is evolving extremely rapidly, in Europe and abroad. The importance of taking into account environmental, social and governance factors in investment decisions has become more acute with the coronavirus. Past Amundi research has underlined that ESG integration has been a driver of alpha since 2014.

This article explores whether or not ESG can be considered as a new factor, alongside traditional factors (value, momentum, etc.) and the key findings are:

- In Europe, ESG has become a beta strategy and therefore is crucial for diversification in multifactor portfolios.
- In North America, ESG remains an alpha strategy and diversification adds little value.

This difference is most likely the result of greater investor mobilization in Europe than in North America. Going forward, the coronavirus may act as a catalyst for the ESG landscape, with four elements that may play out in the near future:

1. An increasing focus on the Social pillar, as health systems, education, inequalities, workplace safety and so on are in the limelight.
2. Mounting regulation and supervision, with the integration of ESG into considerations on systemic risk.
3. A new framework for measuring economic performance that includes ESG criteria.
4. A new set of values that may lead to the growth of certain markets including social bonds.

Introduction

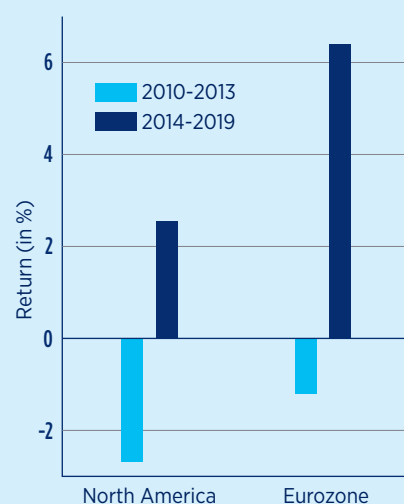
The responsible investing landscape is evolving extremely rapidly, as more investors integrate ESG (Environmental, Social and Governance) into their processes. This is particularly true in Europe, but Asia and North America are catching up. The coronavirus crisis could even accelerate this process. Indeed, this global catastrophe will reshape the economic world and redefine values in a more globally accepted manner, allowing ESG to move beyond the existing culturally biased criteria. Before the coronavirus pandemic, global warming was the main focal point for justifying ESG investing. But the covid-19 reshuffles the cards. Criteria such as health and safety, working conditions or employment practices are now under the spotlight. These are the underlying components of the social pillar, which is in on the verge of becoming a new focal point¹ for adopting ESG criteria in portfolio management. In two previous research works (Bennani *et al.*, 2018; Drei *et al.*, 2019), we showed that ESG screening positively impacts financial performance of stock portfolios since 2014.

For instance, we report the annualized return of a long/short strategy² between best-in-class and worst-in-class stocks in Figure 1. We notice that the long/short strategy has generated a positive alpha since 2014, whereas ESG investing has penalized ESG investors between 2010 and 2013.

When we speak about alpha generation, we generally refer to factor investing. Indeed, factor investing makes the difference between the financial performance coming from systematic factors and the financial performance coming from specific factors. Said differently, factor investing makes the difference between alpha and beta. In factor investing, beta (or systematic) factors correspond to the common risk factors that explain a significant part of the cross-section of stock returns. Since ESG changes the landscape of asset management, we may wonder whether ESG has become a new risk factor and must be integrated into a factor investing framework, or whether it remains an alpha strategy. ■

Figure 1.

Annualized return of best-in-class vs worst-in-class long/short portfolios



1. In fact, the social dimension is much more related to the environmental dimension (and also to the governance dimension) than what people generally believe. For instance, the shared socio-economic pathways (SSPs) are scenarios of projected socio-economic global changes up to 2100. They are derived from climate change scenarios (Riahi *et al.*, 2017). Another example is the permafrost, which contains 1.700 billion tons of carbon, almost double the amount of carbon that is currently in the atmosphere. Arctic permafrost holds roughly 15 million gallons of mercury – at least twice the amount contained in the oceans, atmosphere and all other land combined. In addition to the global warming risk, the thawing of the permafrost also threatens to unlock disease-causing viruses and bacteria long trapped in the ice. Pandemic risk is not excluded if giant viruses are revived. The consequences of the disappearance of the permafrost are unknown and may have extreme consequences on social concerns.

2. These research reports divide stocks into 5 quintiles according to their ESG score. The worst-in-class category corresponds to the 5th quintile or the 20% stocks with the lowest ESG score, while the best-in-class category corresponds to the 1st quintile or the 20% stocks with the highest ESG score.

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Is ESG a new risk factor?

To answer this question, we consider three approaches based on factor models: single-factor, multi-factor and factor picking. We consider the standard factors derived from a factor investing framework: size, value, momentum, low-volatility and quality. These factors are built using the Fama-French methodology of sorted portfolios. Contrary to the academic literature, we consider a long-only framework, which is the usual approach of institutional investors. This means that the factors correspond to Q1 portfolios or best-in-class stocks. Moreover, we consider the traditional market factor, which corresponds to the capitalization-weighted portfolio. All the analyses use weekly returns.

We first estimate single-factor models with a cross-section methodology. For that, we regress stock returns on a constant and each single factor. For each stock, we can then calculate the proportion of the return variance explained by the factor. Results are given in Table 1.

How to read these figures? Between 2010 and 2013, the market risk factor explains 40.8% of the dispersion of North American stock returns. This figure is 23.3% if we consider the size factor in the Eurozone between 2014 and 2019.

We observe that ESG has been a strong contender as a standalone factor and competes with the market risk factor. On average, since 2014, the market risk factor explains 28.6% of

the cross-section variance, whereas the ESG factor has an explanatory power of 27.4% in North America. In the Eurozone, these figures are respectively 36.3% and 35.3%. Moreover, it has more explanatory power than the other risk factors both in North America and the Eurozone during the two periods: 2010 – 2013 and 2014 – 2019.

What do these results become if we consider a multi-factor model in place of single factors? In this approach, we compare the CAPM, the standard five-factor (5F) model based on size, value, momentum, low-volatility and quality risk factors, and the six-factor (6F) model, which consists in adding the ESG factor to the universe of the five alternative risk factors. In Table 2, we verify that the 5F model increases the proportion of systematic risk with respect to the CAPM. For example, the CAPM and the 5F model explain respectively 28.6% and 38.4% of the cross-section variance in North America during the recent period. Adding the ESG factor has a minor impact between 2014 and 2019: 39.7% versus 38.4% in North America and 45.8% versus 45.0% in the Eurozone. This means that the ESG factor does not significantly improve the 5F model. However, if we apply statistical tests of significance to the 6F model, we find that ESG is statistically significant in the Eurozone, but not in North America. We may conclude that ESG could be a risk factor in the Eurozone, but not in North America. ■

Table 1.

Results of single-factor regressions (average R^2)

Factor	North America		Eurozone	
	2010 - 2013	2014 - 2019	2010 - 2013	2014 - 2019
Market	40.8%	28.6%	42.8%	36.3%
Size	39.3%	26.1%	37.1%	23.3%
Value	38.9%	26.7%	41.6%	33.6%
Momentum	39.6%	26.3%	40.8%	34.1%
Low-volatility	35.8%	25.1%	38.7%	33.4%
Quality	39.1%	26.6%	42.4%	34.6%
ESG	40.1%	27.4%	42.6%	35.3%

Table 2.

Results of multi-factor regressions (average R^2)

Factor	North America		Eurozone	
	2010 - 2013	2014-2019	2010 - 2013	2014-2019
Market	40.8%	28.6%	42.8%	36.3%
5F model	46.1%	38.4%	49.5%	45.0%
6F model (5F + ESG)	46.7%	39.7%	50.1%	45.8%

What is the added value of ESG in terms of diversification?

The previous results may be disturbing to some readers. Indeed, cross-section regressions show that ESG is a very good single factor, but the added value of ESG in a multi-factor framework is limited. The difference between the two approaches is the cross-correlation between risk factors that are taken into account into the cross-section multi-factor regression.

In order to better understand these results, we consider a factor picking (or a factor selection) approach. This approach is similar to the multi-factor approach, but we run a lasso³ penalized regression in place of the traditional least squares regression. The advantage is that we can control the factor intensity of the multi-factor portfolio. Therefore, we obtain a factor selection procedure. Beginning with a low factor intensity, we can determine which risk factors are the most important. Then, we increase the factor intensity in order to establish an ordering between risk factors. When the factor intensity reaches 100%, we obtain the same results calculated previously with the linear regression.

Figure 2.

Factor picking (North America, 2014-2019)

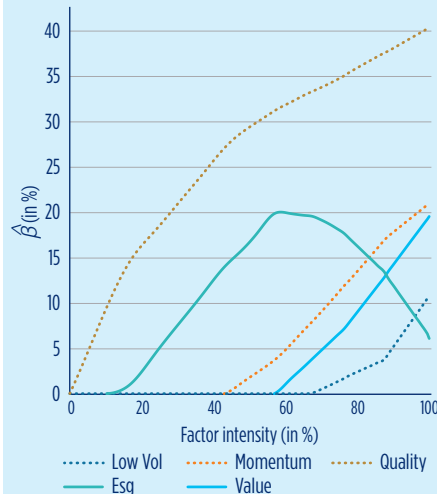
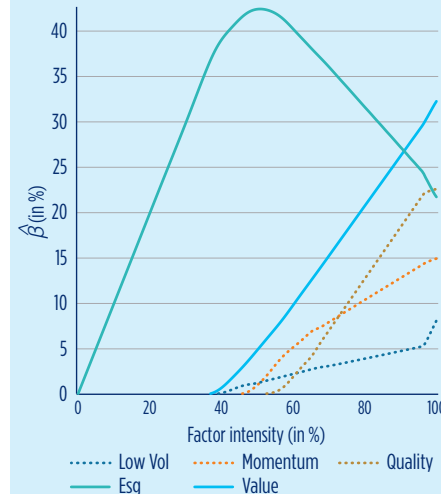


Figure 3.

Factor picking (Eurozone, 2014-2019)



3. A lasso method is a regression analysis model that performs both variable selection and regularization in order to reduce the in-sample bias and enhance the interpretability of the coefficients.

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The results are reported in Figures 2 and 3 for the period 2014-2019. In North America, we notice that quality is the first selected factor, followed by ESG, momentum, value, and finally low-volatility. Therefore, ESG is the second selected factor in North America. Thus, ESG should be a significant factor when building a multi-factor portfolio. However, we observe that

the ESG beta first increases and then decreases when we increase the factor intensity. When the factor intensity reaches 100%, ESG represents a low exposure. Therefore, a part of the ESG exposure has been replaced by an exposure to other risk factors. This means that ESG has a high contribution in a low-diversified portfolio, but it is somewhat redundant in an

already well-diversified portfolio. In the case of the Eurozone, we face a different situation. ESG is the first selected factor and remains an important factor even if we increase the factor intensity. It is more significant than momentum and low-volatility. ■

What is the difference between alpha and beta strategies?

These different results (single-factor, multi-factor and factor picking) show that ESG strategies remain alpha strategies in North America. They have generated outperformance, they are diversifying, but they cannot explain the dispersion of stock returns better than the standard 5F risk model. This implies that introducing ESG in a multi-factor portfolio, which is already well-diversified, adds very little value. This is clearly the definition of an alpha strategy. On the contrary, we notice that ESG is a significant factor in a Eurozone multi-factor portfolio. We may then improve the diversification of multi-factor portfolios by integrating an ESG factor. As such, in the Eurozone, it seems that an ESG strategy is more a beta strategy than an alpha strategy. These last observations can be related to the development of factor investing, to

low-volatility and quality risk factors. Low-volatility strategies have been known for many years, but they primarily emerged in the asset management industry between 2003 and 2004 after the dot.com bubble. Initially, low-volatility strategies were considered alpha strategies. After the 2008 Global Financial Crisis, they were massively implemented, thereby becoming beta strategies. The case of the quality anomaly is similar⁴. This shows that there is not a clear demarcation between alpha and beta. When an alpha strategy is massively invested, it has an enough impact on the structure of asset prices to become a risk factor.

The alpha/beta status of ESG strategies is related to investment flows. Indeed, an alpha strategy becomes a common market risk factor once it represents a significant part of

investment portfolios and explains the cross-section dispersion of asset returns. This may explain that ESG is more a risk factor in the Eurozone than in North America. Indeed, ESG investment flows mainly concern European investors. The first movers were large European institutional investors that are also massively exposed to North American stocks. But they have been followed in a second time by medium-size European institutional investors that are less exposed to North American stocks. This can explain that ESG has a lower impact on North American stocks from a factor investing viewpoint. Looking forward, we can anticipate that ESG will become a common risk factor over the coming years in North America once large American institutional investors move as well. ■

4. Quality strategies date back to the seminal academic paper of Piotroski (2000). However, they really become popular after 2009-2010. According to Google Scholar, this paper was cited only 164 times between 2000 and 2008 by Academia, but 818 times between 2009 and 2018.

Coronavirus as a catalyst for ESG

If we consider the last two financial crises (the 2000 dot.com bubble and the 2008 global financial crisis), they were catalysts for some investment strategies. Thus, the dot.com bubble was a catalyst of the minimum-variance portfolio whereas the 2008 GFC was a catalyst of the quality investing strategy⁵. Even if the covid-19 crisis is not exclusively a financial crisis, its impact on the financial sector will certainly be more important than the previous two financial collapses. And many elements show that it can be a catalyst for the ESG landscape.

The first catalyst element is the readjustment on the social pillar, and to a lesser extent, on the governance pillar. Until now, ESG motivations have been more focused on the environmental pillar, and more precisely on climate-related issues. At the sovereign level, the risk of an undersized and unequal health care system has

clearly materialized. Consequently, ESG criteria will certainly be reweighted with an emphasis on the public health system and inequalities (income, education, etc.). At the corporate level, social issues will be reconsidered for defining ESG ratings, for example labor practices, workplace safety, employee benefits, precariousness, etc.⁶

The second catalyst factor is regulation and supervision. Indeed, each crisis leads to strengthening the rules of the game. For example, the Dodd-Frank Act, the Basel III framework and the creation of the Financial Stability Board have emerged because of the 2008 global financial crisis. We can anticipate a new rise of regulation and supervision after the covid-19 crisis. However, contrary to the 2008 crisis, these new rules of game will not be limited to financial risks, but they will mainly concern extra-financial risks. For a long time,

the systemic risk was exclusively viewed as a financial network risk. With the covid-19 crisis, the concept of systemic risk must be redefined and include other network risks, such as a public health emergency.

The third catalyst factor concerns the measurement of economic performance. The covid-19 crisis has showed that some strong companies have totally stopped their business because they are highly dependent on factors that may be out of their control: supply chain management, foreign workforce, workplace safety, etc. In this context, sustainable long-term economic performance may both integrate financial and extra-financial criteria. This remark also applies to the public sector.

Finally, the last catalyst factor applies to society and shared common values. With the covid-19, ESG values will be reinforced, implying that

5. And also for the low-volatility risk factor.

6. Moreover, this crisis comes as a reminder that unpredicted events happen. Unfortunately, they will most likely be other sanitary crises and possibly shortages in the coming years as consequences of natural events and global warming. The adaptability, independence and resiliency of human systems to face such crises will most likely be under closer investigation, and the entire ESG notation scheme might evolve in that extent.

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the battle against this economic and financial crisis must be done with respect to these new emerging values⁷. Otherwise, it will be difficult to justify the new government deficits and new quantitative easing programs. While the Paris Climate Agreement has been key for the

market of green bonds, the covid-19 crisis may mark a turning point for the development of social bonds.

In this context, it is obvious that the cross-section dispersion of stock returns will

dramatically increase because of the extra-financial risks and the ESG-related factors. Therefore, ESG is now a “must have” to understand factor investing in the new era of covid-19. ■

7. ESG measures has been characterized by regional, cultural bias in their definition. For instance, UK which is well known for the initiation of stewardship programs has been linking ESG heavily on the governance pillar while Nordics have favored the environmental and social pillars. In the face of a pandemic and on the recent debate on the homogeneity of ESG metrics, it is likely that local and cultural biases will be evaluated against their performance to protect health and economic activity.

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