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ESG Investing in Recent Years: New Insights from Old Challenges

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This research is an update of the study that we published last year (Bennani *et al.*, 2018) and that explored the impact of ESG investing on asset pricing in the stock market. It extends the original period 2010-2017 by adding eighteen months from January 2018 to June 2019. These new results confirm the previous results as we reach the same essential conclusions once again. ESG investing tended to penalize both passive and active ESG investors between 2010 and 2013. Contrastingly, ESG investing was a source of outperformance from 2014 to 2019 in Europe and North America. Moreover, ESG can be considered as a risk factor in the Eurozone, while it continues to be an alpha strategy in North America.

However, the last 18 months exhibit new interesting patterns. First, we observe a transatlantic divide since the results for North America and the Eurozone are different for the recent period. Second, we document a partial ordering between ESG ratings and performance that can be explained by a shift from a static to

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a dynamic approach to ESG investing. Third, we note some discrepancies between active and passive management. Fourth, the social pillar seems to have gained traction these last years, and is no longer the laggard pillar. Fifth, factor investing and ESG investing are more and more connected. In what follows, we develop and explain these five key findings.

Acknowledgements

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1 Introduction

In November 2018, we published a discussion paper¹ “*How ESG Investing Has Impacted the Asset Pricing in the Equity Market*”, which summarized the comprehensive research “*The Alpha and Beta of ESG Investing*” of Bennani *et al.* (2018a). Leveraging our in-house ESG dataset and focusing on three methodologies — active management, passive management and factor investing — we concluded that there was a radical break around 2013–2014, with greater integration of ESG criteria in North America and Eurozone stock markets between 2014 and 2017, but the impact of ESG screening on return, volatility and drawdown was still highly dependent on the selected time period and the investment universe. More specifically, we took note of two success stories between 2014 and 2017, namely the **E**nvironmental pillar in North America and the **G**overnance pillar in the Eurozone, and one Japanese puzzle, where the 2010–2013 period was more favorable for ESG screening than the 2014–2017 period. Finally, our factor investing framework showed that ESG could be considered as a risk factor in the Eurozone, showing advanced ESG integration in that area, but it still remains an alpha strategy in North America.

One of the motivations behind this research was to offset a contention with academic findings. Many studies are based on long-term historical data, while the tools created for the extra-financial analysis of companies are recent and the sustainability investment space is quickly evolving. ESG regulations and sustainable investing funds have both increased drastically, creating specific market conditions that cannot be tested too far back in time. In consistency with this reasoning, this discussion paper does not shy away from monitoring trends in the ESG space over a short period of time, and focuses on the last eighteen months² from January 2018 to June 2019, while our 2018 discussion paper focused on the 2010–2017 period. Despite this short time frame, we still identify some interesting trends that we believe should help sustainable investors to better implement ESG in their portfolios.

First, we notice a major divergence between America and Europe in ESG equity trends. While these two regions (accounting for more than three quarters of the MSCI World’s weight) both showed positive advancements in ESG integration in our previously studied period, we now observe a setback in North America but some progress in the Eurozone, particularly on the active management side. The returns of North American long-short portfolios are less than in the previous 2014–2017 period for all dimensions, and even slightly negative on the **E**nvironmental pillar. Being an environmental investor during

¹The discussion paper and the associated working paper are available in the Amundi Research Center: <http://research-center.amundi.com/page/Article/2019/01/The-Alpha-and-Beta-of-ESG-investing>.

²The new period is denoted by 2018–2019 even if it only concerns the first half of 2019.

this last period was a losing bet. On the other side, the Eurozone gains even more momentum on some pillars and stays positive for all long-short portfolios, hence the idea of a halt in the convergence of these two investment universes, or a transatlantic divide.

We also observe a development in approaching ESG integration. We interpret the positive returns of our long-short portfolios (built as being long on the top quintile and short on the bottom quintile) as a proof that best-in-class selections and worst-in-class exclusions are still acceptable approaches to ESG investing. In the new period 2018–2019, the $Q_1 - Q_5$ performance is still positive on all dimensions in North America and the Eurozone, with the exception of the **Environmental** pillar in North America. However, looking at intermediary portfolios, especially the Q_4 quintile stock selection, we cannot ignore that there is more to the $Q_1 - Q_5$ story. We hypothesize the seemingly abnormal performance of Q_4 as the emergence of forward-looking strategies, with some investors betting on improving companies rather than well-scored companies. This shift towards a dynamic view is still a positive development, as this increase in complexity of ESG integration demonstrates that sustainable investors might better understand underlying issues and are moving beyond a binary black and white view of corporations.

On the passive management side, we note a reduction in the excess return. This development is the consequence of both the better integration of ESG pillars in market pricing and the shift towards dynamic views as illustrated through the Q_4 puzzle question. However, the tracking error cost of increasing portfolio scores is stable overall compared to the previous period and we still measure a noticeable tracking error cost premium for optimizing on the **Governance** pillar compared to the **Environmental** and **Social** pillars.

In the 2018 paper, we observed a delayed integration of the **Social** pillar. We acknowledged that while the **Environmental** and **Governance** pillars had a turning point around 2013/2014, the integration of the **Social** pillar came later around 2016. Therefore, it is without too much surprise that we observe this pillar performing very well in both sorted and optimized portfolios during the 2018–2019 period. We draw a parallel between trends in equity markets and social narratives both within and outside the corporate landscape. For instance, we think about the U.S. Business Roundtable public statement declaring it “*redefines the purpose of a corporation to promote an economy that serves all Americans*” or the awarding of economists whose research focused on alleviating global poverty.

The results of our factor analysis remain practically unchanged since the last publication. We still view ESG as an alpha strategy in North America, while in the Eurozone, it is the best explaining single-factor of stock returns and makes a lot of sense to be included in a factor investing portfolio.

2 The Transatlantic Divide

As a proxy for active management strategies, we have implemented the Fama-French method of sorted portfolios. On a quarterly basis, we rank the stocks based on their score, and build five sector-neutral quintile portfolios³. Portfolio Q_1 corresponds to the 20% best-ranked stocks, whereas portfolio Q_5 corresponds to the 20% worst-rated stocks. The selected stocks are then equally-weighted and each portfolio is invested on the last trading day of the previous quarter, at the closing price, and is held for three months⁴.

Looking at the $Q_1 - Q_5$ long-short portfolios in North America (Figure 1) and the Eurozone (Figure 2), we can see the evolution of the integration of ESG and its subdimensions in both markets⁵. In the 2010–2013 period, sustainable investors were penalized, as seen by the negative return of the $Q_1 - Q_5$ long-short portfolios. In 2014–2017, after the radical break in ESG integration, which we discuss in greater detail in our 2018 discussion paper, ESG investing gained momentum and yielded positive returns on all pillars on both sides of the Atlantic.

After eight years of parallel development, we observe a contradictory trend in ESG investing between North America and the Eurozone since 2018. Indeed, the last period 2018–2019 is marked by a squeeze in long-short returns on all dimensions in North America, and even a loss on the **E**nvironmental pillar⁶. This loss is important because it is the first long-short portfolio with a negative return since the 2013/2014 ESG turning point in these two investment universes, and it reminds us how much the performance of ESG investing is also regulation-driven. In this case, our first intuition is to look at the shift in American public policies, notably the announced withdrawal of the United States from the Paris Climate Agreement and some of the changes at the U.S. Environmental Protection Agency (EPA), which might have impacted the asset pricing of the **E**nvironmental pillar. However, the negative performance of the **E**nvironmental pillar should not overshadow the performance reduction of the **S**ocial and **G**overnance pillars during the 2018–2019 period, meaning that the concerns relate to the three pillars of ESG investing.

On the Eurozone side, the verdict is more positive. All long-short portfolio returns are positive. During the 2018–2019 period, the **E**nvironmental and **S**ocial pillars yield even stronger returns comparatively to the previous period. The decline of the **G**overnance long-short portfolio return can be partly

³Given a universe of stocks, each portfolio is composed of 20% of the assets.

⁴The full methodology is explained in Bennani *et al.* (2018a).

⁵The portfolios are built using the MSCI North America and MSCI EMU indices as the respective equity universes.

⁶The annualized return is equal to -0.8% for the 2018–2019 period whereas it was equal to $+4.1\%$ for the previous period 2014–2017.

Figure 1: Annualized return of $Q_1 - Q_5$ long-short portfolios (North America)

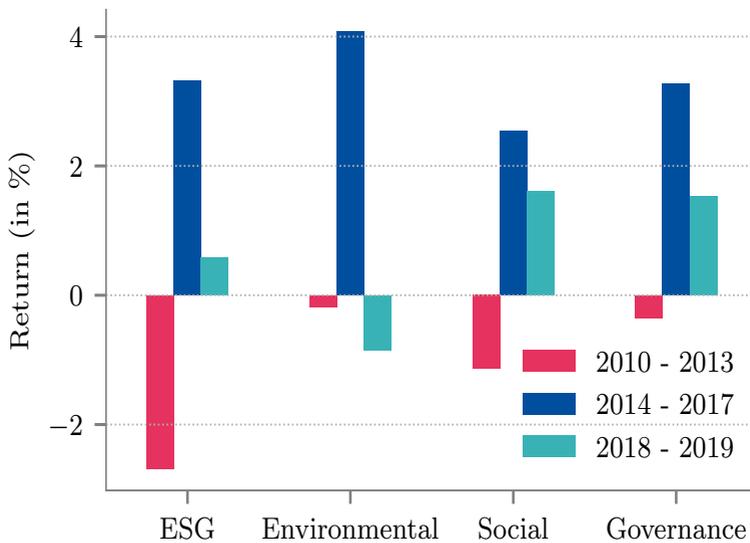
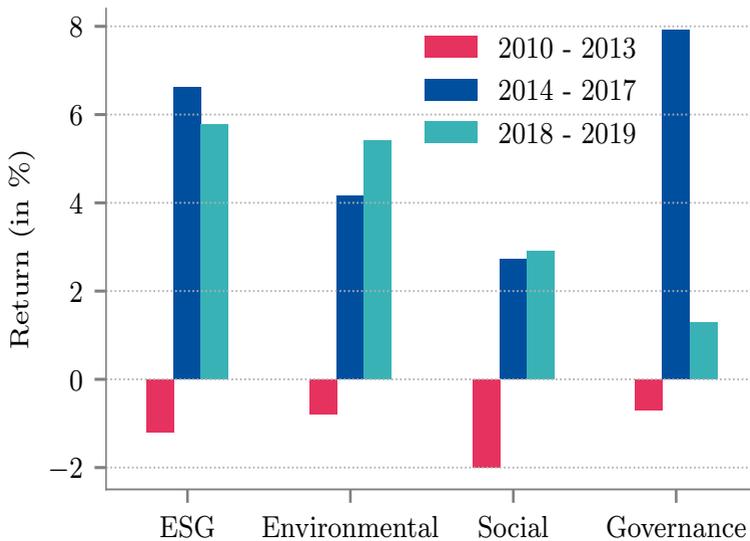
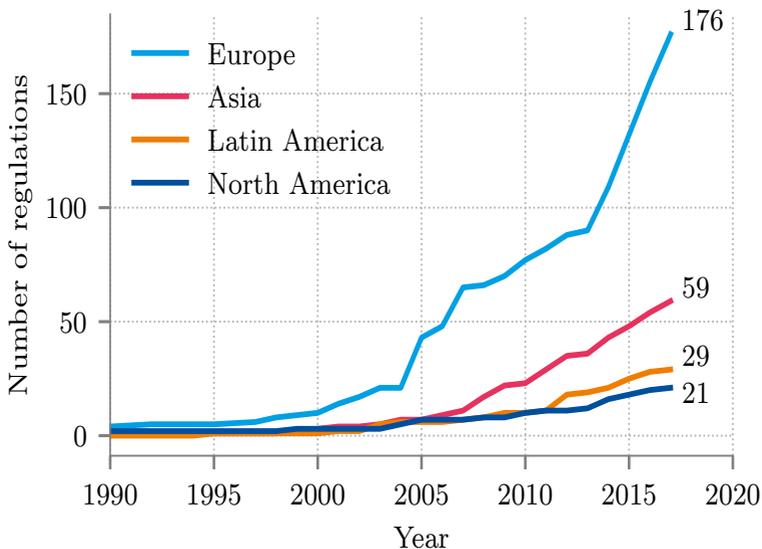


Figure 2: Annualized return of $Q_1 - Q_5$ long-short portfolios (Eurozone)



attributed to a mean-reversion effect after an extraordinary period of impressive performance. Indeed, the annualized return was 7.9% between 2014 and 2017, compared to just 1.3% for the most recent period. It follows that, if we consider the screening based on the global **ESG** score, the recent period is in line with the previous period since the two periods post an annualized return around 6%.

Figure 3: Number of ESG regulations



Source: PRI, responsible investment regulation database, 2019.

How to explain the transatlantic divide? In Bennani *et al.* (2018b), we assumed that two main effects contributed to the ESG performance from 2014 to 2017: the selection effect of ESG screening and the demand effect of ESG screening. By selection effect, we think about the direct impact of extra-financial information on stock prices. By considering other risk dimensions, the ESG investor may select corporations that are better managed from social, environmental and governance points of view, or may avoid corporations that present extra-financial weaknesses. The underlying idea is that sooner or later these extra-financial risks have a financial impact on the performance of the corporation. The second effect is related to the supply/demand balance. Indeed, a stock price is the equilibrium between the supply and the demand for this stock. It is obvious that ESG investment flows that have been observed these recent years may have largely contributed to the good performance of

ESG investing over the 2014–2017 period. For the most recent period, we may think that European investors’ serious interest in ESG issues continues to impact supply and demand with a subsequent effect on European stock prices in 2018 and 2019. For North American equities, the mobilization of European investors has been followed by relatively strong engagement by Canadian investors, but a relatively weak implication of U.S. investors. A first explanation of the American setback can be found in these engagement differences. But as explained before, another justification could be the public policy of the Trump administration in terms of its ESG roadmap. It follows that a third component may contribute to the ESG performance: the political and regulatory environment. In Figure 3, we report a summary of the regulatory perspective between Europe, North America, Asia and Latin America. For the last few years, we observe that ESG regulations have gained the greatest momentum in Europe, while North America has recently stalled, and we believe these developments are linked to the transatlantic divide⁷.

3 A New Paradigm and the Q_4 Puzzle

When plotting the annualized return of the sorted portfolios, we notice an anomaly on some Q_4 portfolios. Notably, for **S**ocial sorted portfolios in North America (Figure 4) and **E**nvironmental sorted portfolios in the Eurozone (Figure 5), we observe a performance of Q_4 that is at Q_1 ’s level or above. Curiously, this ranking disorder only happens for the Q_4 sorted portfolio.

We refer to this phenomenon as a puzzle because it goes beyond the binary outcome in which $Q_1 \succ Q_5$ holds or does not. In these two specific cases (**S**ocial in North America and **E**nvironmental in the Eurozone), we still observe a positive return for the $Q_1 - Q_5$ long-short portfolio, so the abnormality of Q_4 does not point towards the end of best-in-class and worst-in-class approaches. These strategies are still viable and yield respectively 1.6% and 5.4% in annualized returns during the last period. Rather, we believe that the Q_4 puzzle marks the emergence of new ESG investment strategies. The $Q_1 - Q_5$ approach is representative of a static view of **ESG** scores, when best-in-class stocks remain best-in-class stocks and worst-in-class stocks remain worst-in-class stocks, while playing intermediary quintiles, especially the fourth quintile, seems to be related to the strategy of ESG improvers or ESG momentum and a dynamic view of **ESG** scores. During the last two years, ESG strategies have become more complex, and this may explain the ranking disorder of the Q_4 portfolio.

⁷In particular, through the last years, we observe that the slope of the European curve, that includes the regulations at the country level, is stronger than the North American slope, that includes the regulations at the state level for the United States.

Figure 4: Annualized return of sorted portfolios (North America, Social, 2018–2019)

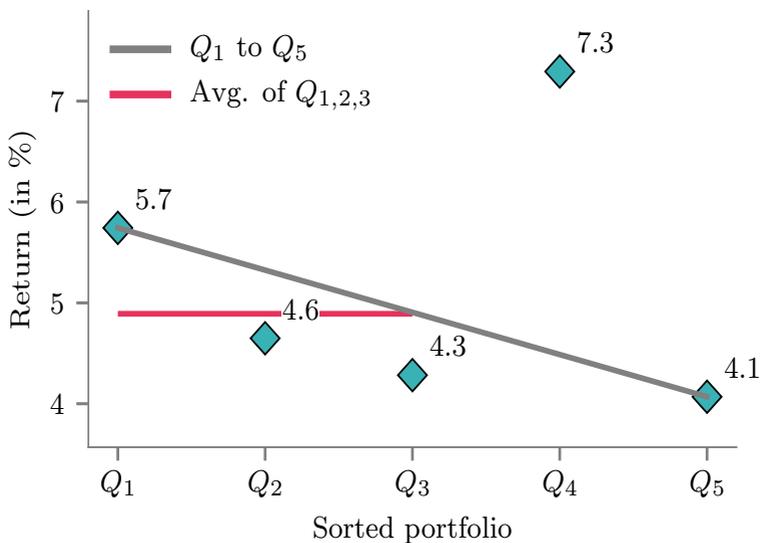
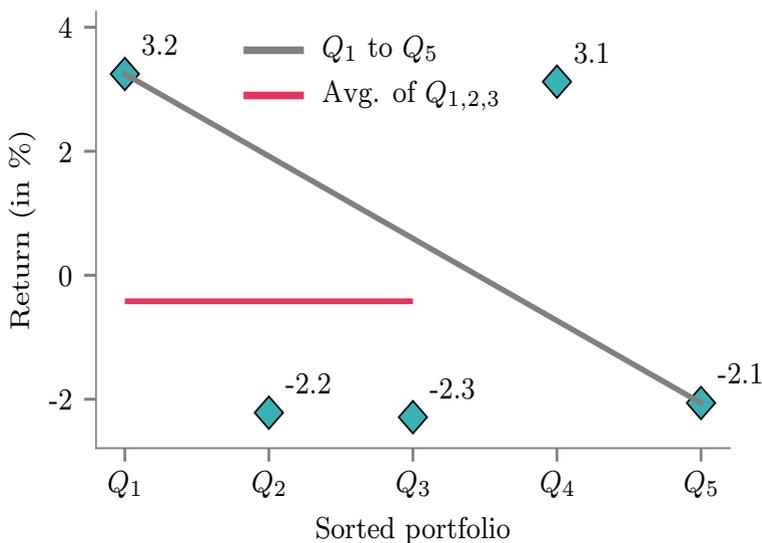


Figure 5: Annualized return of sorted portfolios (Eurozone, Environmental, 2018–2019)



We also note greater stabilization of **ESG** scores at the extremities over time in our dataset. This means that, in the last few years, well ranked companies are even more likely than before to continue to be well viewed by the ESG analysts, and similarly for poorly ranked companies. This stickiness might have forced some investors to look for other opportunities in more dynamic areas, namely middle quintile stocks. Additionally, our performance attribution analysis showed that the return of well-performing Q_4 portfolios is mostly due to selection effects.

This finding is in line with the results reported by the Global Sustainable Investment Alliance (2019). In its 2018 investment review, the organization documents that the most common way to participate in sustainable investing (as measured by assets under management allocated to each strategy) is to implement negative screening, but this approach is closely tailed by ESG integration⁸ and corporate engagement strategies. Similarly, the European Sustainable Investment Forum (2018) found similar results a year before, and stated that *“the main strategy is exclusion, but in the last two years the growth rate of this strategy slowed down. In contrast, best-in-class and ESG integration have had a high growth rate”*. Investment strategies based on the dynamics of **ESG** ratings do not clearly correspond to negative or positive screening, but they are more related to ESG integration. In this approach, an improvement of an extra-financial criterion may lead to portfolio rebalancing, exactly as we observe for financial ratios. It is obvious that the convergence between the extra-financial approach and the traditional security analysis based on financial statements would certainly help increase the focus on the dynamics and momentum of **ESG** ratings and not just their static level.

4 Optimized Portfolios: Not As Easy As Before

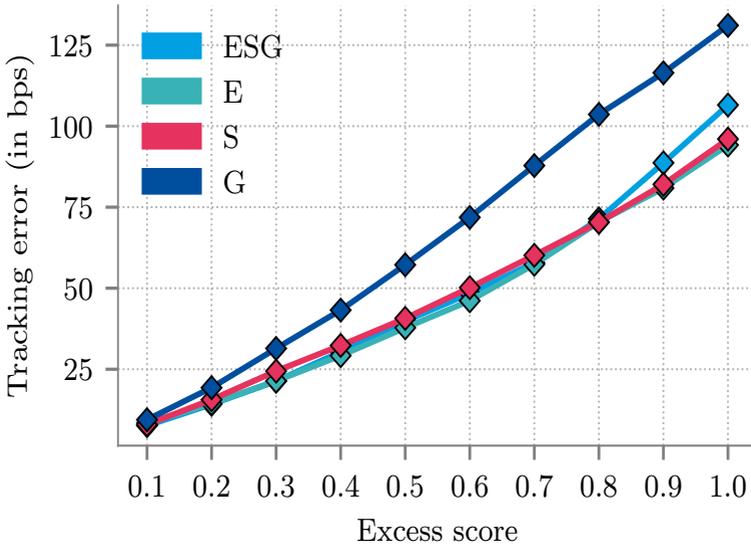
Concurrently with the development of active strategies, ESG integration is also commonly deployed in passive management using the tilted portfolio technique. The popular approach is to select a benchmark representative of the universe to which the investor wishes to gain exposure, then increase its ESG exposure while controlling for the tracking error volatility of the managed portfolios. More frequently, investors will define additional constraints to limit the portfolio turnover or sector-related bets. For this research, we simply try to find the minimum tracking error portfolio for a given increment in **ESG** score.

⁸This is defined by the Global Sustainable Investment Alliance as *“the systematic and explicit inclusion by investment managers of environmental, social and governance factors into financial analysis”*.

For each level of score improvement, this approach gives us two metrics: the corresponding tracking error and the annualized excess return.

In Figure 6, we report the relationship between the **ESG** excess score and the tracking error for the global DM universe⁹. For instance, targeting an improvement of 0.5 for the **ESG** score requires accepting a tracking error of 40 bps. We obtain similar results to the ones we found in the 2018 discussion paper in terms of tracking error level. Investors must accept a tracking error risk if they want to implement ESG in a passive management framework, where the benchmarks correspond to market capitalization-weighted (CW) indices¹⁰. This clearly raises the definition of a strategic asset allocation (SAA) policy. The fundamental issue is the reconciliation between ESG investing and SAA based on CW indices when institutional investors are sensitive to the tracking error risk. And, most of the time, they are!

Figure 6: Efficient frontier of optimized portfolios (Global DM)



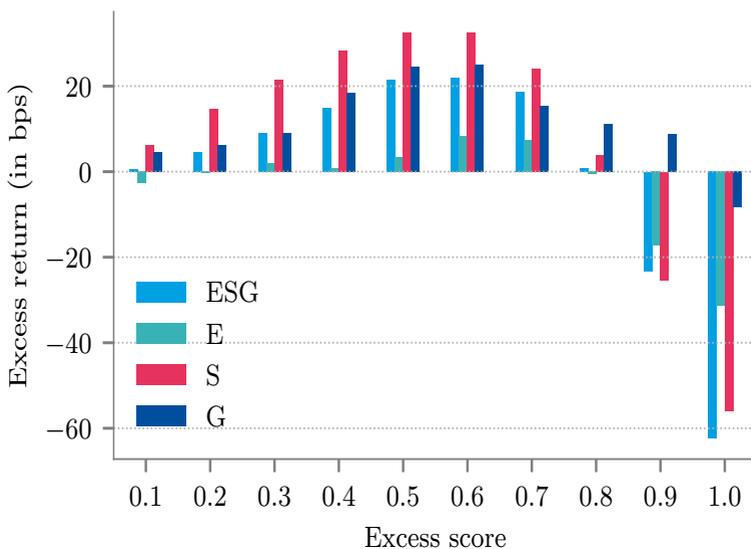
Let us now consider the second important dimension of **ESG** tilted portfolios. In Figure 7, we report the relationship between the excess score and the excess return. For instance, an excess score of 0.5 led to an annualized excess return of +22 bps for the 2018–2019 period. During the 2014–2017 period, we found that the same excess score generated an excess return of +16 bps.

⁹It corresponds to the investment universe (also called index universe or equity universe) of the MSCI World index.

¹⁰Moreover, we confirm that the **G**overnance pillar generates more tracking error than the two other pillars.

Results are therefore similar. As previously, we also notice that the relationship between excess score and excess return is not necessarily monotonous. It increases when we target a low excess score and decreases when we target a high excess score. This reversal phenomenon is most likely due to the diversification effect. Indeed, by increasing the excess score, we reduce the number of positions held in the managed portfolio. Therefore, there comes a threshold where the gains from the ESG screening are offset by the losses resulting from the diversification reduction.

Figure 7: Annualized excess return of optimized portfolios (Global DM)



For a given universe and a specific score (**E**, **S**, **G** or **ESG**), we can compute the maximum excess return (MaxER) for the period¹¹ and the reversal excess score (RevES) beyond which the excess return becomes negative. For instance, in the case of the global DM universe and the **ESG** score, we can see that up to 0.8, the excess return remains positive and the maximum excess return is equal to +22 bps and is reached when the excess score is equal to 0.5. It follows that MaxER = 22 bps and RevES = 0.8.

Comparing our optimized portfolios on North American (Figure 8) and Eurozone investment universes (Figure 9) might give the wrong impression that it invalidates our transatlantic divide thesis. North American portfolios (except for the **Environmental** pillar) follow the representative concave shape we expect when running this kind of optimization. On the contrary, Eurozone

¹¹It corresponds to the highest excess return among all optimized portfolios.

Figure 8: Annualized excess return of optimized portfolios (North America)

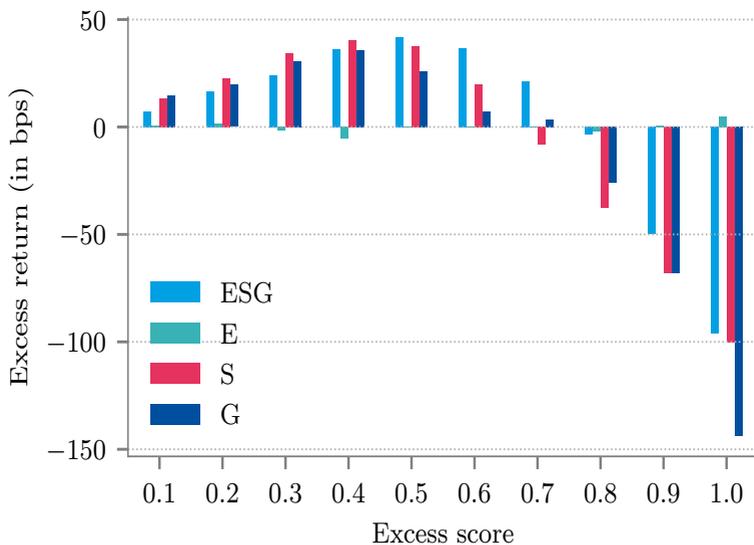
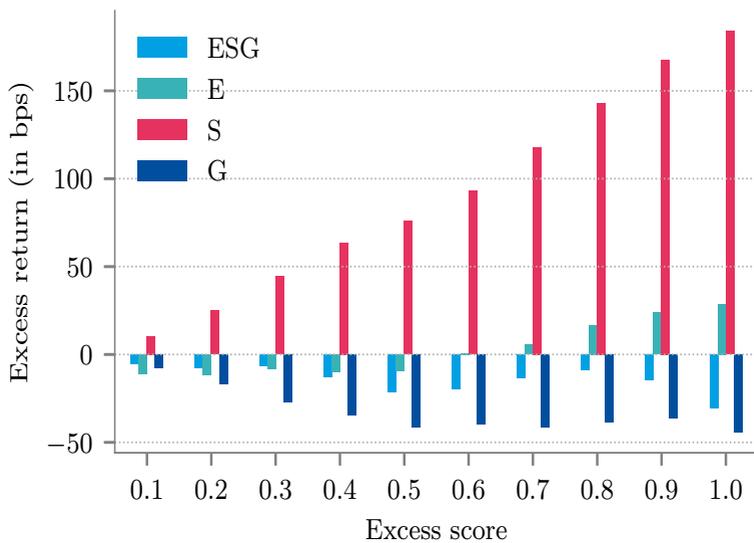


Figure 9: Annualized excess return of optimized portfolios (Eurozone)



portfolios break this pattern. In fact, the results for the Eurozone universe seem at first sight inconsistent with respect to those obtained in the case of sorted portfolios.

To better understand these seemingly conflicting results, we dive into the relationship between size and ESG, and notice an important effect. For large and mega-cap¹² stocks, ESG sorting generates a performing selection effect across the whole scoring range, or, $Q_1 \succ B_L \succ Q_5$ where B_L is the equally-weighted portfolio of large-cap stocks. For mid-cap stocks, ESG filtering seems to work well on the exclusion side but not from a best-in-class perspective, and we have the less favorable following setting $B_M \succ Q_5 \succ Q_1$, where B_M is the equally-weighted portfolio of mid-cap stocks. Unfortunately, our unconstrained optimizations generate portfolios that continuously overweight these mid-cap Q_1 stocks. We believe this is related to scoring issues: noisiness in the **ESG** signal due to lower volumes of information, potentially inappropriate decay parameters, focus on average ratings as opposed to score confidence intervals. This extends our new paradigm discussion, with sustainable investors who will have to develop more complex views of ESG, depending on company sizes.

Another reason is the previously mentioned loss of diversification. The North American universe includes on average more than 700 stocks, while the Eurozone universe is composed of about 240 stocks. This is directly reflected in our optimization results. When we target an **ESG** excess score of +1.0, the North American portfolio holds on average 175 stocks, while the Eurozone portfolio contains about 100 stocks. Another aspect to take into account is the impact of the Q_4 puzzle on optimized portfolios. This creates more instability even when the return of the $Q_1 - Q_5$ long-short portfolio is positive.

Table 1: Summary of optimized portfolios

		Global DM				North America				Eurozone				Japan			
		ESG	E	S	G	ESG	E	S	G	ESG	E	S	G	ESG	E	S	G
2014-17	Maximum ER	38	129	7	87	18	129	1	28	282	250	86	440	49	0	6	191
	Reversal ES	1+	1+	0.8	1+	1+	1+	0	.7	1+	1+	1+	1+	1+	0	0	1+
2018-19	Maximum ER	22	8	33	25	42	5	41	36	0	29	184	0	0	24	0	0
	Reversal ES	0.8	0.5	0.8	0.9	0.7	0	0.6	0.7	0	0.8	1+	0	0	0.7	0	0

We summarize our results on optimized portfolios¹³ in Table 1. We note a reduction in both the maximum excess return and the reversal excess score for

¹²We classify large and mega-cap stocks as stocks with market capitalizations above €15 bn.

¹³With the addition of the Japanese investment universe, which corresponds to the stocks of the MSCI Japan index.

most pillar-universe pairs. In the Eurozone, where the loss of diversification is reached faster than in North America, optimized portfolios generate poorer results (except for the **S**ocial pillar). Overall, we think that tilted portfolios can still capture excess returns but return profiles are less interesting than before. This is in great part due to the Q_4 puzzle and the mid-cap story¹⁴ and passive investors are required to integrate dynamic views of ESG in order to avoid this squeeze.

5 Social: From Laggard to Leader

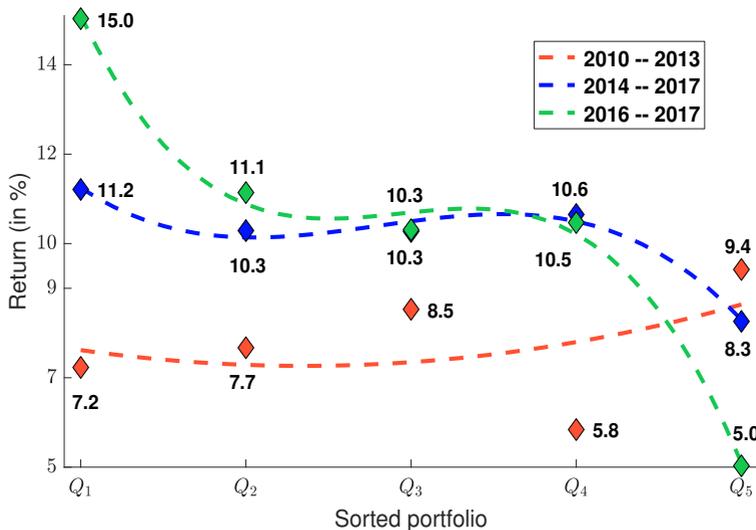
In Bennani *et al.* (2018a), we already noted that despite the identification of an ESG turning point in 2013/2014, pillars have been integrated into stock prices at different paces. Namely, **E**nvironmental and **G**overnance benefited from a head start in that space. One hypothesis is to consider these two pillars as more straightforward from a risk management perspective. Even investors who do not integrate the ESG lenses into their investment processes understand that there is a general trend towards more taxation in order to curb negative externalities linked to corporate pollution, and good corporate governance could be a hedge against management fraud and principal-agent problems.

The social case has been less obvious to investors but recent changes in its narrative might have helped this last pillar to finally gain momentum. Since the financial crisis of 2007–2008, inequality has been brought back to the table. To illustrate this trend, we can mention the book *Capital in the Twenty-First Century* written by Piketty (2014), of which *The Economist* attributed its exceptional success to “*being about the right subject at the right time*”. More recently, the Royal Swedish Academy of Sciences has just awarded the Nobel Memorial Prize in Economic Sciences to three economists “*for their experimental approach to alleviating global poverty*”. This social momentum goes beyond the academic realm. Even in the backdrop of the China–United States trade war, the current U.S. administration has been vocal about wanting American companies to focus on domestic job creation, and there has been an effort on the corporate side to at least show that the message has been heard¹⁵ (Business Roundtable, 2019).

¹⁴If we impose the mid-cap neutrality on **ESG** optimized portfolios, only **G** tilted portfolios underperformed in the 2018–2019 period in the Eurozone, while **E**, **S** and **ESG** optimized portfolios presented a positive excess return. Therefore, it is obvious that the scoring of mid-cap (and small-cap) corporations is an important topic of ESG investing.

¹⁵We think about some of the statements of the Business Roundtable, which brought together the CEOs of some largest American corporations, that define *the purpose of a corporation* and would make Freeman (2010) blush.

Figure 10: Annualized return of sorted portfolios (Eurozone, Social, 2010–2017)



Source: Bennani *et al.* (2018a).

Figure 11: Annualized return of sorted portfolios (Eurozone, Social, 2018–2019)

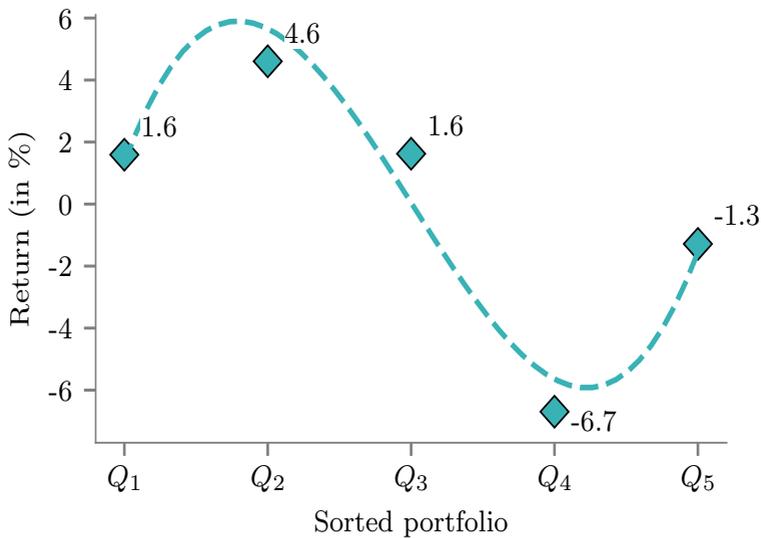


Figure 10 is directly taken from our previous working paper (Bennani *et al.*, 2018a) and already shows well the gain in momentum of the **Social** pillar since 2016 in the Eurozone through annualized returns of sorted portfolios. Figure 11 is an update on the 2018–2019 period and shows that the **Social** pillar continues to thrive. The $Q_1 - Q_5$ long-short portfolio posted a return of 2.9% whereas a $(Q_1 + Q_2) - (Q_4 + Q_5)$ long-short portfolio would display a performance of 7.1% if we consider the same long and short notional exposures! The fact that Q_1 and Q_2 dramatically outperform Q_4 and Q_5 explains why **Social** is the winning pillar when implementing passive management in the Eurozone between 2018 and 2019. In North America, we have already presented the returns of the sorted portfolios in Figure 4 on page 11. We had observed a monotone increasing function between the **Social** score and the performance except for the Q_4 sorted portfolio¹⁶. However, this puzzle of the **Social** pillar in North America is balanced by the good behavior of the pillar in the case of optimized portfolios. In Figure 8 on page 15, we note that the **Social** pillar exhibits good performance for low and medium excess scores. If we consider the global DM universe, **Social** is clearly the winning pillar¹⁷.

Remark 1 *Despite these good results, we have to be careful and not extrapolate these trends in the future. Indeed, we generally notice that the performance of extra-financial criteria is mean-reverting and we observe some cycles in ESG investing. For instance, **Environmental** was the winning pillar in Europe between 2010 and 2013. Then, **Governance** took the lead, while **Social** is today on all fronts. In America, the cycle is less marked, but has begun with **Governance** followed by **Environmental**. Since we also expect that more dynamic ESG investment strategies will be developed, it is extremely difficult to be forward-looking. But it is obvious that in the past, the performance sequence that we have observed can be related to the implementation sequence of ESG investors.*

6 All Quiet on the Factor Front

In the previous discussion paper, after finding evidence for greater ESG integration in the 2014–2017 period, we dared to wonder if ESG was a new risk factor. To answer this question, we defined two main criteria for eligibility as risk factor: generating extra performance or reducing risk, and being a complement to traditional risk factors. We concluded for the previous period that ESG strategies remained alpha strategies in North America. They

¹⁶The annualized return is respectively 4.1% for Q_5 , 4.3% for Q_3 , 4.6% for Q_2 and 5.7% for Q_1 .

¹⁷See Figure 7 on page 14.

have generated outperformance, they are diversifying, but they cannot explain the dispersion of stock returns better than the standard five-factor risk model based on size, value, momentum, low-volatility and quality. On the contrary, we drew a different conclusion for the Eurozone. We observed that ESG improved diversification of multi-factor portfolios and concluded that in this region, “an ESG strategy was more a beta strategy than an alpha strategy” (Bennani *et al.*, 2018b).

In order to test this hypothesis again, we use the same multi-factor analysis and factor picking framework as those developed in Bennani *et al.* (2018a). For the multi-factor analysis, we perform the cross-section regression of all stocks that belong to North America and the Eurozone index universe with respect to the CAPM, the five-factor model and a six-factor model that includes the ESG risk factor¹⁸. Table 2 shows the average R^2 of each model. While the impact of adding the ESG factor is positive for all periods and the two investment universes, we concede that it has a minor impact in 2018–2019: 47.5% versus 46.3% in North America and 45.4% versus 44.2% in the Eurozone. However, these results were roughly the same for the 2014–2017 period.

Table 2: Cross-section regression (average R^2)

Period	North America		Eurozone	
	2014–2017	2018–2019	2014–2017	2018–2019
CAPM	26.2%	34.9%	37.7%	32.6%
5F	35.4%	46.3%	45.3%	44.2%
6F (5F + ESG)	36.8%	47.5%	46.0%	45.4%

In addition to these linear regressions, we run lasso regressions with different levels of penalty. The main advantage of this method is that it shows a sequential ranking of factors for all levels of factor intensity¹⁹. This sequentiality helps us to understand which factors contain overlapping information. Figure 12 shows the results for North America. Quality is first selected, then followed by ESG, momentum, low-volatility, and finally value²⁰. Although the

¹⁸The five risk factors are the following standard factors: size, value, momentum, low-volatility and quality. The factors are built similarly to our sorted portfolios and, contrary to the academic literature, they correspond to Q_1 long-only portfolios, and not to $Q_1 - Q_5$ long-short portfolios. The reason is that factor investing is massively implemented in long-only portfolios. Therefore, it is more realistic to consider long-only risk factors in order to conclude if ESG does make sense or not in a factor investing framework.

¹⁹A factor intensity of 0% corresponds to the lasso regression with a penalty so high that no factor is selected, while a factor intensity of 100% corresponds to the lasso regression with a penalty of 0, which is the same as the ordinary least square regression.

²⁰We do not include the size factor since it is implicitly embedded in the other risk factors.

Figure 12: Factor selection (North America)

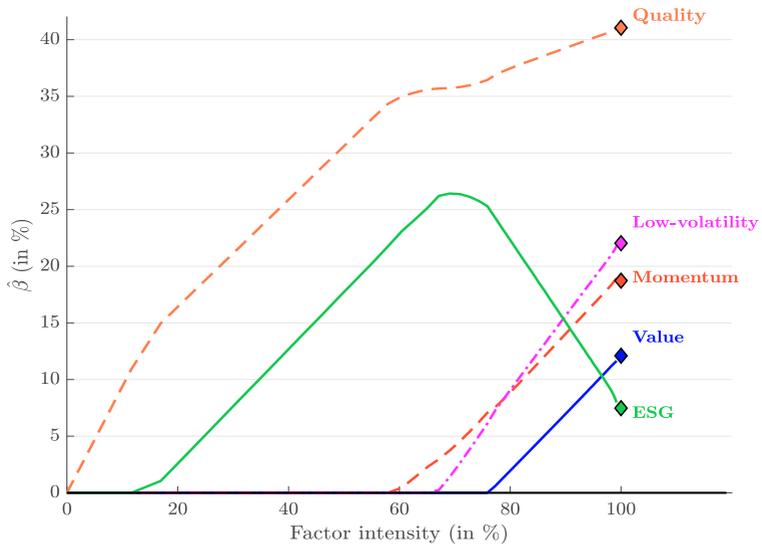
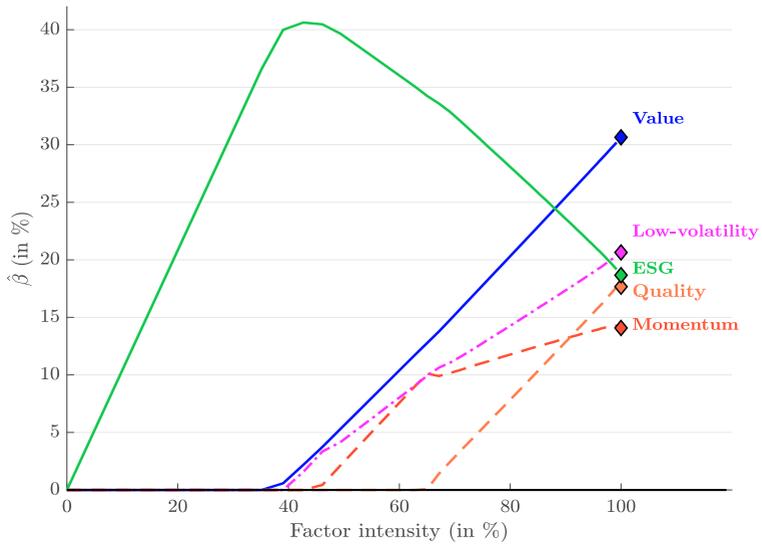


Figure 13: Factor selection (Eurozone)



ESG factor is the second factor selected, it ends up last once factor intensity reaches 100%. This is interpreted as the ESG factor containing some information in North America, but offering little diversification benefits in multi-factor framework. In other words, ESG does make a lot of sense in a poorly diversified portfolio, but it does not improve the diversification in a portfolio that is already well-diversified. This confirms our previous conclusion that ESG is an alpha strategy for North America. Figure 13 concerns the Eurozone. In this case, ESG is first selected, then followed by value, low-volatility, momentum and finally quality. In this universe, the ESG factor holds better as the factor intensity rises and ends up between low-volatility and quality when there is no penalty. We confirmed our previous finding that ESG has become a beta strategy in the Eurozone. In Bennani *et al.* (2018b), we already made an analogy to the history of other traditional risk factors. One example was the quality anomaly, which became popular after the Global Financial Crisis and then stopped being an alpha strategy as it has been significantly invested in. We believe something similar happened to the ESG factor in the Eurozone during the 2014–2017 period and the last eighteen months of data confirm this finding.

7 Conclusion

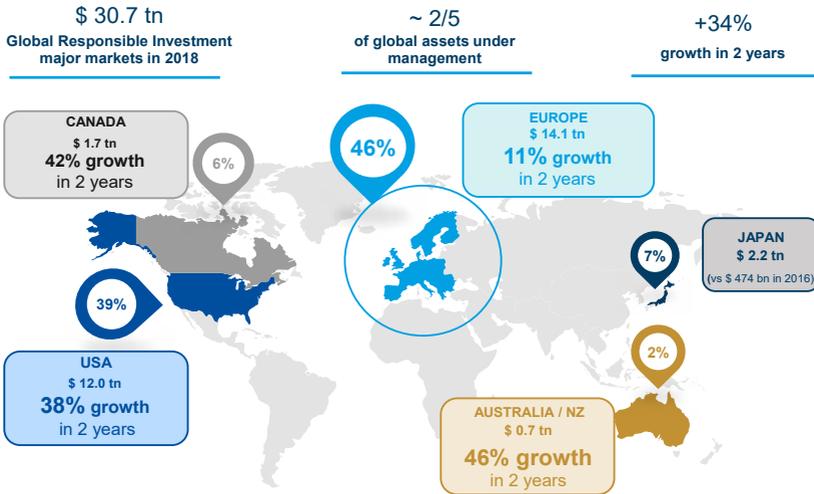
ESG investing is a rapidly evolving area. For instance, we report below some figures from the latest report from the Global Sustainable Investment Alliance. In 2016, the size of the global responsible investment market was \$22.9 tn. Two years later, it stands at \$30.7 tn. With double-digit growth rates²¹, ESG investing is certainly the most dynamic sector of the asset management industry. This concerns all regions and all investment styles. It is obvious that things are moving quite fast in such an environment. This was what motivated us to update our previous research so quickly, because all players in ESG investing have the perception that past results are no guarantee of future results, especially in the socially responsible investing landscape.

Despite the short time period of our study, we come up with some important findings — some positive, some disappointing — for sustainable investors. Overall, it is a more complex environment we describe. These mixed results are closely tied to the dual nature of ESG investing, as a financial innovation (a risk model and a family of investment strategies) and as a moral view of corporations.

ESG can be seen as an alternative risk model. ESG screening can in principle provide a hedge against future pollution-related taxation, management

²¹The annual growth rate for the period 2014–2018 is 6% for Europe, 16% for the United States, 21% for Canada, 50% for Australia/New Zealand, and 308% for Japan (GSIA, 2019).

Figure 14: The market of ESG investing at the start of 2018



Source: Global Sustainable Investment Alliance (2019).

fraud and other risks that cannot be derived from market data and accounting figures alone. Our sorted portfolio results seem to point in that direction, but the reduction in the ESG advantage in North America and the confirmation that ESG is a beta strategy in the Europe tend to indicate that it is becoming the norm rather than an advantage.

ESG investing is also the investment expression of what some investors believe the world should be like. This separates ESG investing from other investment strategies in multiple ways. Financial gain is not always the expected outcome of ESG investing²², and this probably explains why ESG investing has emerged. As a consequence, ESG funds are bound to increase through the conversion of investors who independently from financial expectations decide to become sustainable investors. This creates a positive financial feedback loop unique to the ESG factor, as demand-driven pressure should theoretically increase the price of securities deemed appropriate for inclusion in a sustainable investment strategy. This specific environment is beneficial to dynamic views, and we see that there is already a reward for accompanying corporations on their journey to the good side (as seen through our Q_4 puzzle and the rise of

²²Berg *et al.* (2014) did not find “any significant added value, neither positive nor negative” in the 2005–2013 period, whereas Renneboog *et al.* (2008) found similar results for previous periods.

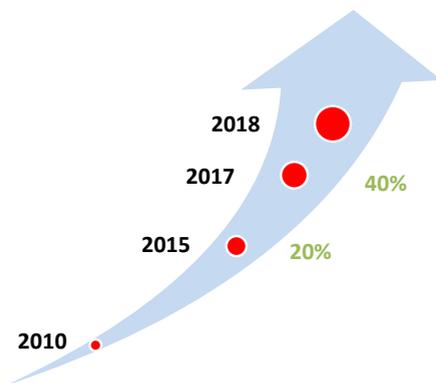
improvers, momentum and engagement strategies). However, this normativity is also a coordination game since moral views are not uniform. CSRHub compared the ratings of two leading ESG rating agencies, MSCI and Sustainalytics, and found a correlation coefficient of 32% between the two datasets²³. Some organizations, such as the network of investors behind the Principles for Responsible Investment (PRI), try to increase the uniformity, but it is still a work in progress. At a more extreme level, national governments can reject these views and drastically affect the ESG risk pricing mechanism.

The fact that there are multiple views on ESG investing creates heterogeneity. In this situation, there are many ways to build a rating system. It is then not unreasonable that **ESG** ratings are less correlated than credit ratings. In fact, there are many issues about **ESG** ratings. First, they correspond to relative metrics, and not to absolute metrics. For instance, we can compare two corporate entities from the same sector, but it is extremely difficult to compare two firms that belong to different sectors or that have two different business models. Second, the meaning of the **ESG** rating is unclear. In the case of credit ratings, the question is: what is the one-year default probability of the entity? An **ESG** rating does not answer a precise question, since it is a multi-faceted metric that combines at least three dimensions: **E**nvironmental, **S**ocial and **G**overnance. The convergence can then only be obtained at more refined levels. And it is illusory to think that we can obtain the same homogeneity at the most aggregate level than we observe for the credit ratings. In fact, this heterogeneity is inherent to the concept of ESG investing and questions the interpretation of the ESG investing figures collected by GSIA (2019). Indeed, according to Figure 14, North America competes on an equal footing with Europe. However, we know that there are strong differences between these two regions in terms of ESG integration, whether it concerns asset owners or asset managers.

In 2018, we were convinced that the break in 2014 marked a major shift concerning the relationship between ESG investing and asset pricing in the stock market and this radical change was irreversible. We believed that the mobilization of investors on ESG issues was high enough to create a positive bubble for ESG assets. This conviction was mainly explained by the increasing interest of our clients. For instance, we have reported the frequency of institutional requests for proposal received at Amundi in Figure 15. Of course, these figures are biased because they only include an asset manager that is highly active in ESG investing. However, even though these absolute figures

²³No direct source. The fact was reported by Robin Wigglesworth in the Financial Times on 20 July 2018. For comparison, this author mentions a correlation of 90% between credit ratings assigned by S&P and Moody's. However, we note that Bruder *et al.* (2019), using the ESG database of MSCI, and despite some methodological differences, performed some similar analyses and found results that do not differ much from ours.

Figure 15: Frequency of institutional RFPs that require ESG filters



Source: Based on RFPs received at Amundi.

are not representative of the global asset management industry, we think that the trend is very interesting to analyze. In 2010, the number of RFPs with an ESG component was very low and less than 5%. In 2015, 20% of institutional RFPs that were received at Amundi required an ESG filter. In 2017, this figure was 40%. We clearly observe a trend and this trend is far from over. Investor interest in ESG issues is certainly the major factor behind the break in 2014. Indeed, we know that investment flows must be substantial in order to impact supply and demand and then stock prices. However, this study also shows that it is not sufficient. The regulatory environment and collective political will are also another important component, because they give some signals to the financial market. Without the right regulatory framework and more transparency, we may face some ‘*free rider*’ or ‘*moral hazard*’ problems²⁴ This issue is also connected to the previous question about the heterogeneity of ESG strategies and the definition of ESG investing.

However, while the ESG investing space is becoming more complex (environmental policy reversal in the United States, shift from a static to a dynamic view of **ESG** scores, lead/lag integration of the different dimensions), our results show that the ESG fundamentals are still present. Best-in-class and worst-in-class approaches still work overall. This is good news on the investment side. On the financing side, an open issue remains: what is the impact of ESG investing on the capital allocation and the cost of capital? This question is left for forthcoming future research.

²⁴Since ESG is a hot topic and also a marketing argument, we may observe some ‘*green-washing*’ behavior or more simply the fact that being an ESG investor covers several aspects.

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