The Alpha and Beta of ESG Investing

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¹The opinions expressed in this presentation are those of the authors and are not meant to represent the opinions or official positions of Amundi Asset Management.
Sorted portfolio methodology

Sorted-portfolio approach

- Sorted-based approach of Fama-French (1992)
- At each rebalancing date \( t \), we rank the stocks according to their Amundi ESG score \( s_{i,t} \)
- We form the five quintile portfolios \( Q_i \) for \( i = 1, \ldots, 5 \)
- The portfolio \( Q_i \) is invested during the period \( [t, t+1] \):
  - \( Q_1 \) corresponds to the best-in-class portfolio (best scores)
  - \( Q_5 \) corresponds to the worst-in-class portfolio (worst scores)
- Quarterly rebalancing
- Universe: MSCI World Index
- Equally-weighted and sector-neutral portfolio (and region-neutral for the global universe)
## Sorted portfolio methodology

**Table:** An illustrative example

<table>
<thead>
<tr>
<th>Stock</th>
<th>$s_{i,t}$</th>
<th>Rank</th>
<th>$Q_i$</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>-0.3</td>
<td>6</td>
<td>$Q_3$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_2$</td>
<td>0.2</td>
<td>5</td>
<td>$Q_3$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_3$</td>
<td>-1.0</td>
<td>7</td>
<td>$Q_4$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_4$</td>
<td>1.5</td>
<td>3</td>
<td>$Q_2$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_5$</td>
<td>-2.9</td>
<td>10</td>
<td>$Q_5$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_6$</td>
<td>0.8</td>
<td>4</td>
<td>$Q_2$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_7$</td>
<td>-1.4</td>
<td>8</td>
<td>$Q_4$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_8$</td>
<td>2.3</td>
<td>2</td>
<td>$Q_1$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_9$</td>
<td>2.8</td>
<td>1</td>
<td>$Q_1$</td>
<td>+50%</td>
</tr>
<tr>
<td>$S_{10}$</td>
<td>-2.2</td>
<td>9</td>
<td>$Q_5$</td>
<td>+50%</td>
</tr>
</tbody>
</table>

$\Rightarrow Q_1 = (S_8, S_9), \ Q_2 = (S_4, S_6), \ Q_3 = (S_1, S_2), \ Q_4 = (S_3, S_7) \text{ and } Q_5 = (S_5, S_{10})$
The performance of ESG active management
The performance of ESG passive management
Is ESG a new risk factor?
On the optimal design of ESG investing

North America

Figure: Annualized return of ESG sorted portfolios (North America)
Figure: Annualized return of ESG sorted portfolios (Eurozone)
ESG investing begins to be rewarded by the market, but there is a strong heterogeneity among regions:

<table>
<thead>
<tr>
<th>Factor</th>
<th>North America</th>
<th>Eurozone</th>
<th>Europe ex-EMU</th>
<th>Japan</th>
<th>Global DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESG</td>
<td>−−−−−−</td>
<td>−−−</td>
<td>0</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>E</td>
<td>−−−−−</td>
<td>0</td>
<td>+</td>
<td>−</td>
<td>0</td>
</tr>
<tr>
<td>S</td>
<td>−−−−−</td>
<td>−−−</td>
<td>0</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>G</td>
<td>−−−−−</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Since 2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESG</td>
<td>++++++</td>
<td>+++</td>
<td>0</td>
<td>−</td>
<td>++</td>
</tr>
<tr>
<td>E</td>
<td>++++++</td>
<td>+++</td>
<td>−</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>S</td>
<td>+++</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>G</td>
<td>+</td>
<td>+++</td>
<td>0</td>
<td>+</td>
<td>+++</td>
</tr>
</tbody>
</table>

- ESG & long-term tail risk management: not yet confirmed!
- **S** is the New Black?
Arbitrage between ESG and TE

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

There is no free lunch
ESG investing implies to take a tracking-error risk!
Performance of optimized portfolios

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

ESG investing & diversification: Mind the gap
Summary

• Similar results than those obtained with ESG active management
• ESG investing requires to take tracking-error risk ⇒ Current SAA policies are not adapted
• $G$ generates more tracking error than $E$ and $S$ ($\approx \times 1.5$)
• Impact of ESG on the diversification (stock picking \neq optimized index portfolios)
Table: Results of cross-section regressions with long-only risk factors (average $R^2$)

<table>
<thead>
<tr>
<th>Factor</th>
<th>North America</th>
<th>Eurozone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>39.3%</td>
<td>23.6%</td>
</tr>
<tr>
<td>Value</td>
<td>38.9%</td>
<td>24.4%</td>
</tr>
<tr>
<td>Momentum</td>
<td>39.6%</td>
<td>23.8%</td>
</tr>
<tr>
<td>Low-volatility</td>
<td>35.8%</td>
<td>22.2%</td>
</tr>
<tr>
<td>Quality</td>
<td>39.1%</td>
<td>24.1%</td>
</tr>
<tr>
<td>ESG</td>
<td>40.1%</td>
<td>25.1%</td>
</tr>
</tbody>
</table>

- Specific risk has increased during the period 2014 – 2017
- Since 2014, we find that:
  - ESG $>\text{Value} > \text{Quality} > \text{Momentum} > \ldots$ (North America)
  - ESG $>\text{Quality} > \text{Momentum} > \text{Value} > \ldots$ (Eurozone)
### Table: Results of cross-section regressions with long-only risk factors (average $R^2$)

<table>
<thead>
<tr>
<th>Factor</th>
<th>North America</th>
<th></th>
<th>Eurozone</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>40.8%</td>
<td>26.2%</td>
<td>42.8%</td>
<td>37.7%</td>
</tr>
<tr>
<td>5F model</td>
<td>46.1%</td>
<td>35.4%</td>
<td>49.5%</td>
<td>45.3%</td>
</tr>
<tr>
<td>6F model (5F + ESG)</td>
<td>46.7%</td>
<td>36.8%</td>
<td>50.1%</td>
<td>46.0%</td>
</tr>
</tbody>
</table>

***p-value statistic for the MSCI Index (time-series, 2014 – 2017):

- $6F = \text{Size, Value, Momentum, Low-volatility, Quality, ESG (North America)}$
- $6F = \text{Size, Value, Momentum, Low-volatility, Quality, ESG (Eurozone)}$
The performance of ESG active management
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Factor picking

Figure: Factor picking (North America, 2014 – 2017)

- Active management ≠ factor investing
- ESG does really matter for active management!
- The ESG-Value puzzle!

Quality ≻ ESG ≻ Momentum ≻ Value ≻ Low-volatility

BUT...
Factor selection

**Figure:** Factor picking (Eurozone, 2014 – 2017)

- Active management ≠ factor investing
- ESG does really matter for both!
- The ESG-Quality puzzle!

ESG ≻ Value ≻ Momentum ≻ Quality ≻ Low-volatility

**BUT...**
ESG remains an alpha strategy in North America

ESG becomes a beta strategy (= risk factor) in Europe

**Figure**: The market of ESG investing in 2016

Source: Global Sustainable Investment Alliance (2017).
On the optimal design of ESG investing

- Risk-based premium
- Return-based premium: ESG in North America
- Skewness-based premium: ESG and G in the Eurozone, G in North America
- Exclusion, best-in-class or full integration strategy?
Why is ESG investing different in bond markets?

- Two effects for explaining price formation process
  - Intrinsic effect (risks & return opportunities)
  - External effect (supply/demand balance)
- bonds $\neq$ stocks
- Supply/demand imbalance $\Rightarrow$ structure of credit spreads
- Spread correction is then essential when implementing ESG in the bond market

ESG investing and Impact investing are then more correlated in the bond market than in the stock market
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