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.
Amundi quantitative research on ESG and climate risks

Joint research projects between Mohamed Ben Slimane, Leila Bennani, Théo Le Guenedal, Frédéric Lepetit, Thierry Roncalli, Takaya Sekine and Peter Tankov

- The Alpha and Beta of ESG Investing
- How ESG Investing Has Impacted the Asset Pricing of the Stock Market
- Economic Modeling of Climate Risks
- The Stock-Bond Puzzle of ESG Investing (forthcoming)
- Financial Modeling of Climate Risks (forthcoming)

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What is the challenge?

“There is no Plan B, because there is no Planet B“

Ban Ki-moon, UN Secretary-General, September 2014

Is it a question of climate-related issues?

In fact, it is more an economic growth issue²

“The Golden Rule of Accumulation: A Fable for Growthmen“

Edmund Phelps, American Economic Review, 1961
Nobel Prize in Economics, 2006

²The interconnectedness of E, S and G: Economy, Sustainability and Growth
Academic findings

- Relationship between shareholder rights and “higher firm value, higher profits, higher sales growth, lower capital expenditures, and […] fewer corporate acquisitions” (Gompers et al., 2003)

- Positive relation between high corporate social responsibility and low cost of equity capital (El Ghoul et al., 2011): “Employee Relations, Environmental Policies, Product Strategies lower the firms’ cost of equity”

- Corporate financial performance is a U-shape function of corporate social performance (Barnett and Salomon, 2012)

- Cultural differences explain the diversity and differences in intentions (‘Value’ or ‘Values’ oriented) of the currently available ESG data (Eccles and Stroehle, 2018)

- Negative/neutral impact: Schröder (2007), Hong and Kacperczyk (2009)

**Mixed results**
The performance of ESG active management
The performance of ESG passive management
Is ESG a new risk factor?
The case of bonds

Scoring system

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Social</th>
<th>Governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission &amp; energy use</td>
<td>Employment conditions</td>
<td>Board independence</td>
</tr>
<tr>
<td>Water</td>
<td>Community involvement</td>
<td>Audit and control</td>
</tr>
<tr>
<td>Green cars*</td>
<td>Access to medicine*</td>
<td>Remuneration</td>
</tr>
<tr>
<td>Green financing*</td>
<td>Digital device*</td>
<td>Shareholder’s rights</td>
</tr>
</tbody>
</table>

⇒ Weighting schemes depend on sectors

(*) means a specific criterion (related to one or several sectors)

Table: An example of ESG criteria

Source: Amundi ESG Research.
Scoring system

- Sector-neutral
- $z$-score profile (Gaussian mapping) $\Leftrightarrow$ ESG ratings

Figure: Distribution of the ESG scores (December 2018)
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 z-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)
North America

Figure: Annualized return of ESG sorted portfolios (North America)
Eurozone

Figure: Annualized return of ESG sorted portfolios (Eurozone)
North America

**Environmental**

- Return (in %)
  - 2010 -- 2013: 16.4%
  - 2014 -- 2017: 15.6%
  - 2010 -- 2013: 16.8%
  - 2014 -- 2017: 16.6%

**Social**

- Return (in %)
  - 2010 -- 2013: 15.8%
  - 2014 -- 2017: 16.9%
  - 2016 -- 2017: 19.9%
  - 2010 -- 2013: 19.3%
  - 2014 -- 2017: 16.6%

**Governance**

- Return (in %)
  - 2010 -- 2013: 17.2%
  - 2014 -- 2017: 16.9%
  - 2016 -- 2017: 17.8%

⇒ E is the winning pillar
### Eurozone

<table>
<thead>
<tr>
<th>Sorted portfolios</th>
<th>Return (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>9.1%</td>
</tr>
<tr>
<td>Q2</td>
<td>9.2%</td>
</tr>
<tr>
<td>Q3</td>
<td>5.2%</td>
</tr>
<tr>
<td>Q4</td>
<td>5.3%</td>
</tr>
</tbody>
</table>

#### Environmental

- 2010 -- 2013: 13.6%
- 2014 -- 2017: 11.6%

#### Social

- 2010 -- 2013: 15.0%
- 2014 -- 2017: 14.9%

#### Governance

- 2010 -- 2013: 14.9%
- 2014 -- 2017: 14.8%

⇒ G is the winning pillar
Summary

- 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>ESG</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>E</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>−</td>
<td>0</td>
</tr>
<tr>
<td>S</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>G</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
</tbody>
</table>

- Since 2014

<table>
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</tr>
</thead>
<tbody>
<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
Performance of optimized portfolios

- Negative impact of E, S, G and ESG in North America before 2014
- Negative impact of S and ESG in Europe before 2014
- Positive impact in North America and Europe since 2014 (except S)
• 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 \( S \) (≈ \( \times 1.5 \))
• Impact of ESG on the diversification (stock picking \( \neq \) optimized index portfolios)
Specific risk has increased during the period 2014 – 2017
Since 2014, we find that:
- ESG > Value > Quality > Momentum > ... (North America)
- ESG > Quality > Momentum > Value > ... (Eurozone)
### Table: Results of cross-section regressions with long-only risk factors (average $R^2$)

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

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

- 6F = Size, Value, Momentum, Low-volatility, Quality, **ESG** (North America)
- 6F = Size, Value, Momentum, **Low-volatility**, Quality, ESG (Eurozone)
Active management $\neq$ factor investing

ESG does really matter for active management!

The ESG-Value puzzle!

Quality $\succ$ ESG $\succ$ Momentum $\succ$ Value $\succ$ Low-volatility  BUT...
ESG > Value > Momentum > Quality > Low-volatility

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

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

BUT…

*The Alpha and Beta of ESG Investing*
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).
The steamroller of ESG for institutional investors

Figure: Frequency of institutional RFPs that require ESG filters

- In some countries, 100% of RFPs require ESG filters
- For some institutional investors, 100% of RFPs require ESG filters (public, para-public and insurance investors)
- For some strategies, 100% of RFPs require ESG filters (index tracking)

Source: Based on RFPs received at Amundi.
Why is ESG investing different in bond markets?

- Two effects for explaining price formation process
  - Intrinsic effect (asset selection: risks & return opportunities)
  - External effect (investment flows: supply/demand balance)
- bonds $\neq$ stocks
- Supply/demand imbalance $\Rightarrow$ structure of credit spreads
Preliminary results from Ben Slimane et al. (2019)

- IG + HY
- EUR and USD denominated
- January 2010 – November 2018
- 26,400 bonds issued by 5,130 firms
### Preliminary results from Ben Slimane et al. (2019)

Spread correction is then essential when implementing ESG in the bond market.
Preliminary results from Ben Slimane et al. (2019)

Crifo-Diaye-Oueghlissi model (2017)

We retain as dependent variable the log of the yield spread (OAS) of the $i$th security:

\[
\ln OAS_{i,t} = \alpha_t + \beta_s s_{i,t} + \beta_{\text{sub}} \text{SUB}_{i,t} + \beta_{\text{MD}} \text{MD}_{i,t} \\
+ \sum_{j=1}^{N_{\text{cat}}} \beta_{\text{CRT}_j} \text{CRT}_{j,i,t} + \sum_{j=1}^{N_{\text{sect}}} \beta_{\text{SEC}_j} \text{SEC}_{j,i,t} + \varepsilon_{i,t}
\]

where:

- $s_{i,t}$ is the ESG z-score
- $\text{SUB}_{i,t}$ is a dummy variable accounting for subordination
- $\text{CRT}_{j,i,t}$ are dummies for categories of ratings
- $\text{SEC}_{j,i,t}$ are dummies for sectors
- $\text{MD}_{i,t}$ is the modified duration
We test the assumption: $\beta_s < 0$

Preliminary results:
- EUR $\succ$ USD
- IG $\succ$ HY
- Strong differences between sectors: (Banking, Basic materials, Insurance, Consumer goods) \(\neq\) (Communication, Consumer cyclical, Utilities, Energy)
- 2014-2018 $\succ$ 2010-2013
The misunderstanding


⇒ Two misunderstandings:

1. Capital allocation & asset allocation
2. Cost of capital & asset (stock/bond) return
Spillover effects of ESG between bond and stock markets

ESG → Cost-of-capital ↑ → Profitability ↓ → Stock prices

- Bond market → stock market
- Stock market ⇔ bond market (?)
- On the importance of lead/lag effects!

ESG investing and impact on corporate governance are then more correlated in the bond market than in the stock market

Stakeholder ≠ Shareholder
Epilogue

Keynes

“In the long run, we are all dead“

John Maynard Keynes\(^a\), *A Tract on Monetary Reform*, 1923.

\(^a\)“Men will not always die quietly“, *The Economic Consequences of the Peace*, 1919.

Carney

“The Tragedy of the Horizon“

“The Tragedy of the Commons“

Mark Carney, Chairman of the Financial Stability Board, 2015

⇒ Back to the Golden Rule and the Fable for Growthmen...
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