

Machine Learning and ESG: New Frontiers for sustainable investments?

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Pioneer of ESG and Smart Beta integration



Provider of easy-to-use investment solutions through ETFs, funds, and customised mandates



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* Cerulli Quantitative Update: Global Markets 2018 ranked Natixis Investment Managers (formerly Natixis Global Asset Management) as the 16th largest asset manager in the world based on assets under management as of December 30, 2017.

Research at the heart of Ossiam investment process



Since inception Ossiam has set up a scientific committee to complement our quantitative research



Latest publications from Ossiam

ESG controversies and performance impact

October 2018

Understanding Smart Beta Returns

October 2018

ETF use within multi factor portfolios: pure versus benchmarked exposure.

January 2018

Where are we with ESG ?

IMPACT ON FINANCIAL PERFORMANCE

It is a **common idea** to think that ESG integration does not bring any financial performance and may even in some cases have a **negative impact** on performance.

ESG DATA

Today we have access to a **multiplicity of ESG data** and it is growing.

USE OF ESG DATA

Looking at the aggregated data is not the most effective way (loss of information).

The most efficient way is to **disaggregate the data** into its components.

ESG AND FINANCIAL PERFORMANCE

It is also common to under-exploit the **link between ESG scores and financial performances** of a stock, when it should be a **focus point**.

Adaptation is key in the world of ESG

The culture of investment management has changed since 1970s

... there is one and only one social responsibility of business - to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud...

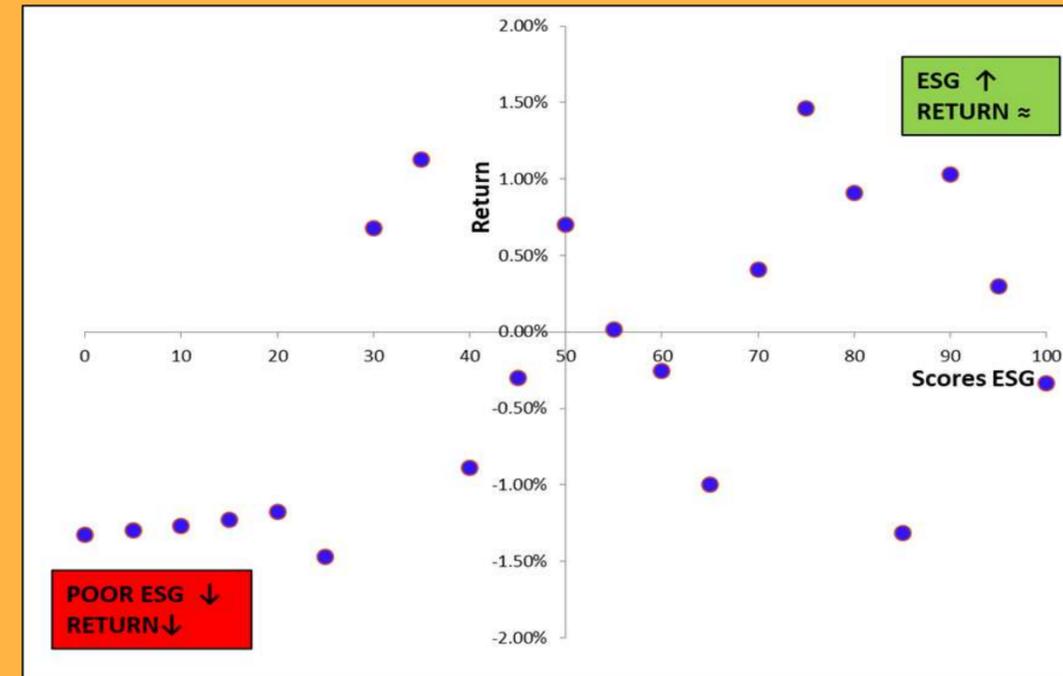


Milton Friedman
The New York Times Magazine (13/09/1970)

Understanding investors and their different needs is fundamental when it comes to providing the appropriate ESG solution

There is no unique ESG solution in the same way there is no single ethics

We have to adapt



Source: Ossiam. Data provided only for illustrative purposes and are not based on market data. The chart illustrates the fact that ESG and Financial Performance does not have a linear relationship, but have a "sparse" relationship.



Source: Ossiam / Bloomberg - Ossiam calculations in USD from 28/09/2007 to 31/01/2019. Past performance is not a reliable indicator of future results.



Think there is alpha?



Classic ESG filtering not always a performance driver.

Companies in different sectors/countries react differently to ESG metrics. One-measure-fits-all does not work properly.

ESG/Machine Learning : a good match

Standard ESG approach do not systematically generate value

Diversification

Investment universes are often very large, therefore ESG exclusions do not systematically produce performance.

Loss of information

ESG ratings are aggregated measures, therefore a lot of information is lost through the rating process.

Granularity

E, S and G ratings do not have the same impact on companies from different sectors, different sizes, etc.



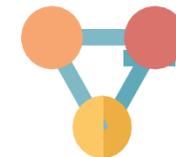
Machine Learning: Methodology that mimics how the human brain functions

- Manage information
- Learn
- Evolve
- Make predictions



Use of pure granular data.

Very large dataset (~3,000 companies, ~600 indicators, ~800 categories).



Identify ESG patterns and profiles associated with positive or negative performance



Goal: split the investment universe into two groups risks and opportunities.

ESG/Machine Learning : a good match

ML is part of already part of our life

ML is **self taught** and therefore able to highlight **evolutionary patterns** without human intervention.

FAMILIARITY

POWER

LEARN

FLEXIBILITY

ML is able to efficiently extract and **analyze information** from large ESG database

ML is **flexible** and quickly adapts to changes of companies' ESG policies coming from on new technologies or regulations

ESG/Machine Learning aims at identifying ESG opportunities

ESG Opportunities explore past relationships between ESG, financial and trading variables and the sign of 3-month returns of individual stocks

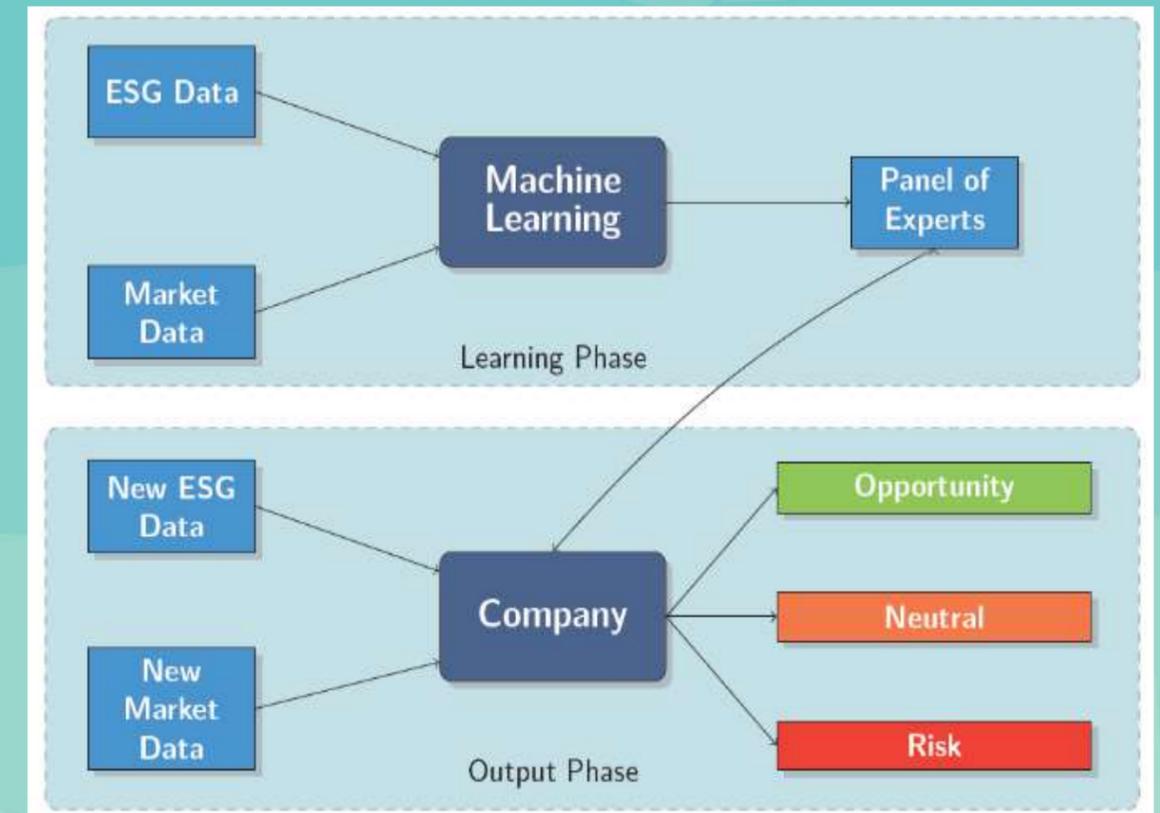
The algorithm's output consists in a set of experts, activated by ESG and financial data.

How does it work ?

1 – Machine Learning look for “experts” that are able to link ESG profiles and financial outlook

2 – The EXPERTS are then applied on current stocks ESG profiles in order to determine whether these stocks represents Opportunities or Risks from a financial perspective

We also build new indicators derived by raw ESG data by introducing indicators based on Sectors, Countries or Peer Groups.



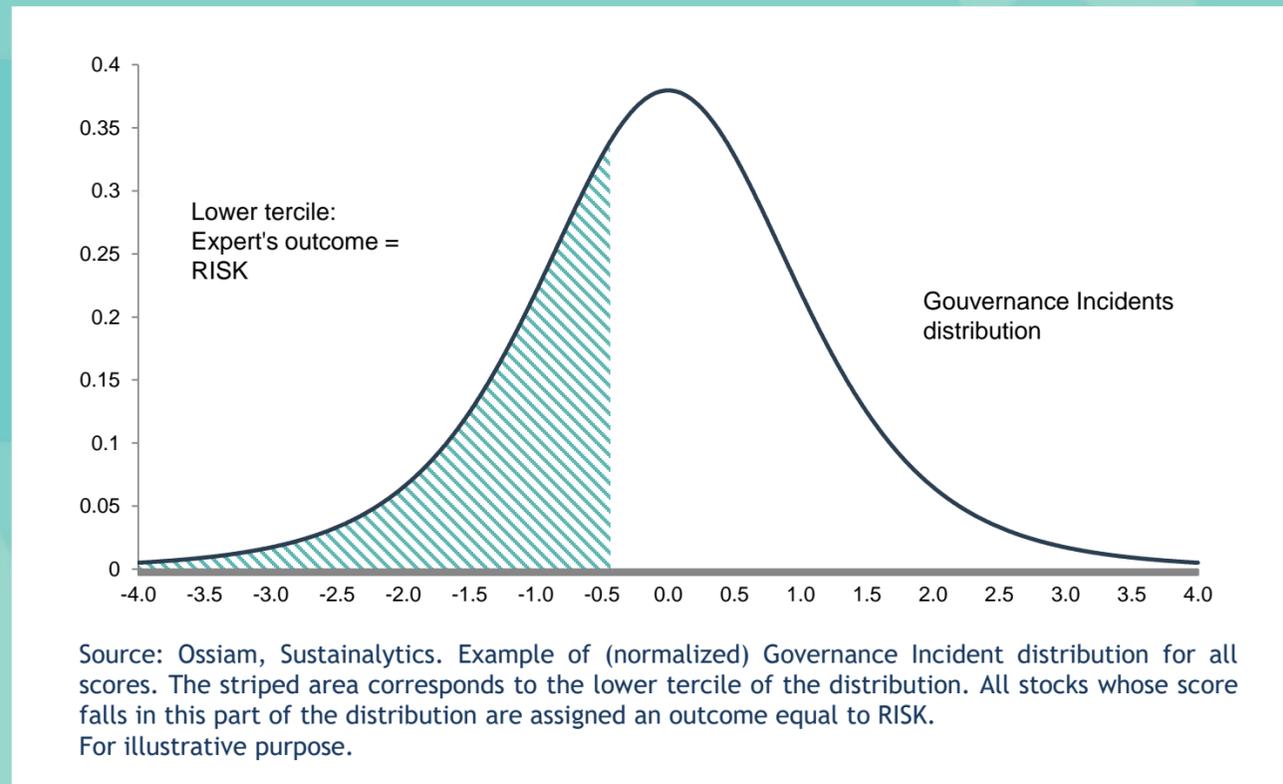
ESG/Machine Learning : application

Machine Learning looks for “experts” that are able to link ESG profiles and financial outlook and determine whether these stocks represents **Opportunities** or **Risks** from a financial perspective

The algorithm’s output consists in a **set of experts**, activated by ESG and financial data.

Examples of experts “Governance Incident”

WHEN Governance Incidents relative to the universe IS EQUAL OR UNDER 33% THEN EXPERT OUTCOME IS RISK OTHERWISE EXPERT IS UNKNOWN



- ✓ This is a risk-based expert. Its outcome can be **RISK** or **UNKNOWN**. The expert highlights a link between Governance Incidents and return.
- ✓ Conditional expectation of 3-month return is on average negative for stocks with a lower Governance Incidents score

The complicated part is to identify the right indicators (here Governance Incidence), the thresholds (here 33%) and the judgment (here RISK) in a way that takes into account Prediction Power, Interpretability and Parsimony.

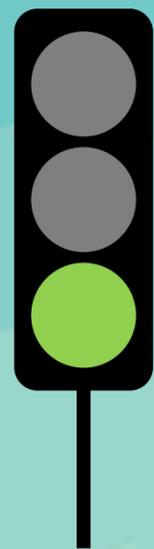
ESG/Machine Learning aims at identify ESG opportunities

An Expert can combine one or more indicators. This is because for many ESG indicators, the real differences can be in the negative part of the distribution (example [0, 33%]) or in the middle (ex. [40%, 60%]) or on the right (ex. [80%, 100%]).

In real situations combining more ESG indicators increases substantially the “knowledge” of the experts and then their predictive strength

Example of Patterns

Positive pattern

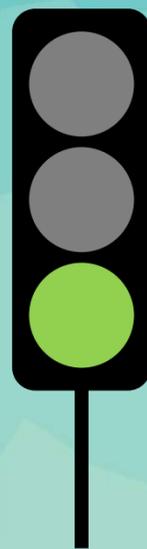


Maximum independence
of the Board

+

Transparency on the compensation
of Board members is above the
average of the sector

OPPORTUNITY



Negative pattern



Controversy level on governance is
particularly high

+

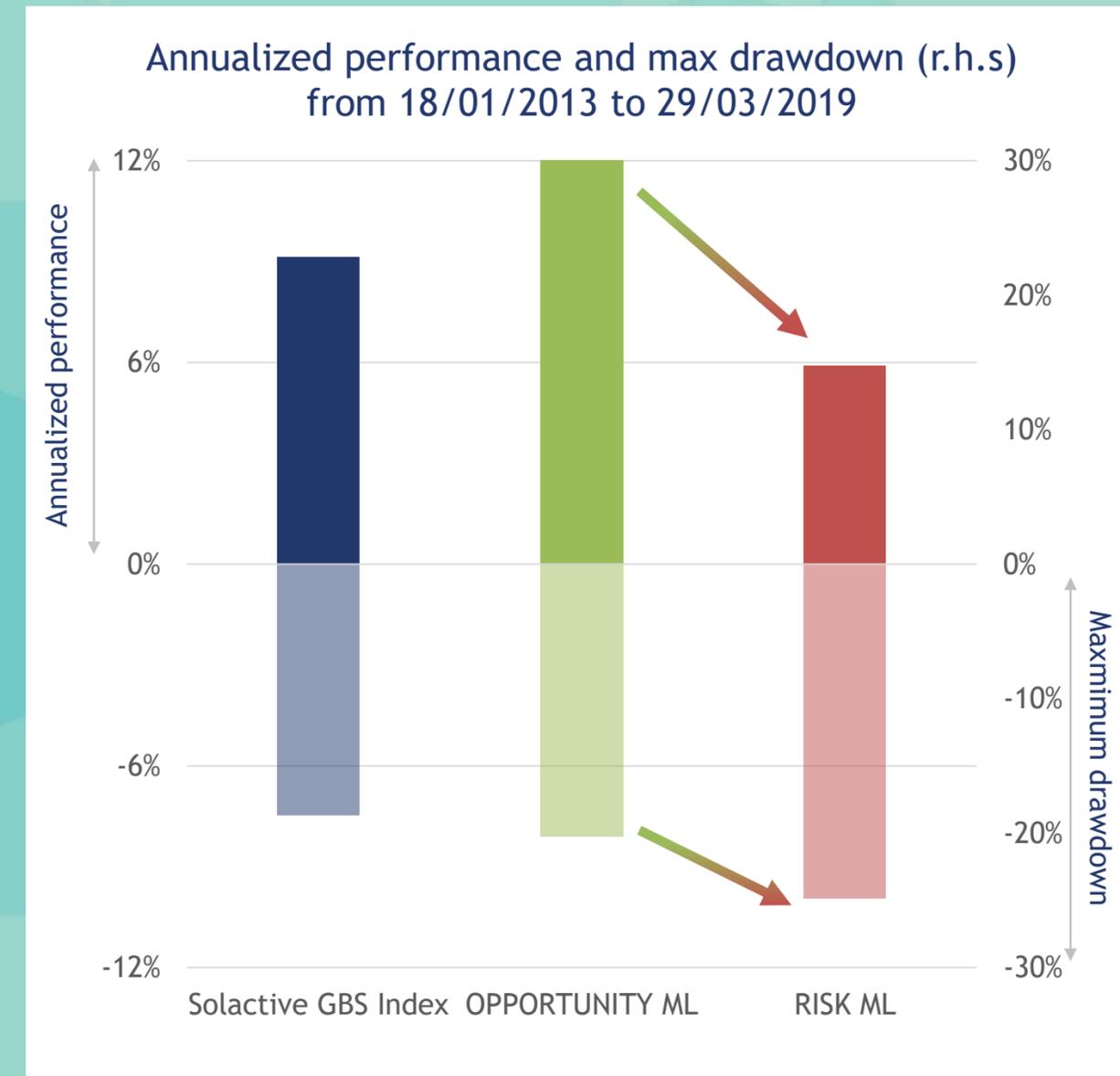
Transparency on the compensation
of Board members is below the
average of the sector

RISK



Machine Learning: Opportunities vs Risks

To assess the power of ML selection, we build two simple cap-weighted portfolios from a global developed benchmark and compare the portfolio of securities selected by Machine Learning vs. the portfolio of securities excluded by Machine Learning



Source: Ossiam, Solactive, Sustainalytics, Trucost. Calculations in USD. Performance are net of charges. Performance data reflects the calculations made by Ossiam on the basis of backtest data. The model assumes reinvestment of net dividends and is presented net of charges. Backtested performance results do not represent the performance of actual trading using client assets, but are achieved by means of the retroactive application of a model. Backtested performance suffers from several limitations, namely they are constructed based on hindsight, and material economic and market factors, as well as client will, may have affected investment decisions differently without such hindsight. Additionally, they do not reflect the impact of actual portfolio trading, which could have affected the price and availability of securities, as well as the transaction fees paid. **Past performance is not a reliable indicator of future results. Please note that if the currency of a strategy is different for the currency of one's reference area, its performance may be affected by the exchange rate fluctuations (both upward and downward).**

Methodology : Ossiam World ESG Machine Learning Strategy

SOLACTIVE GLOBAL BENCHMARK

(around 1 600 Stocks)

ESG CLEANING

(around 1 500 stocks)

- Level of controversy = 5
- Controversial weapons business
- Breach of one of the 10 Principles of the UN Global Compact
- Norges Bank exclusion list
- Tobacco & Coal

MACHINE LEARNING SELECTION

(around 600 stocks)

- Select all stocks labeled as OPPORTUNITY by the Machine Learning Panel of Expert.

CARBON SCREENING

(around 400 stocks)

- Exclusion oh high GHG Emission (Scope 1 + 2 + 3)
- Reintegration of stocks with the highest Green-to-Brown Ratio

MINIMUM VARIANCE

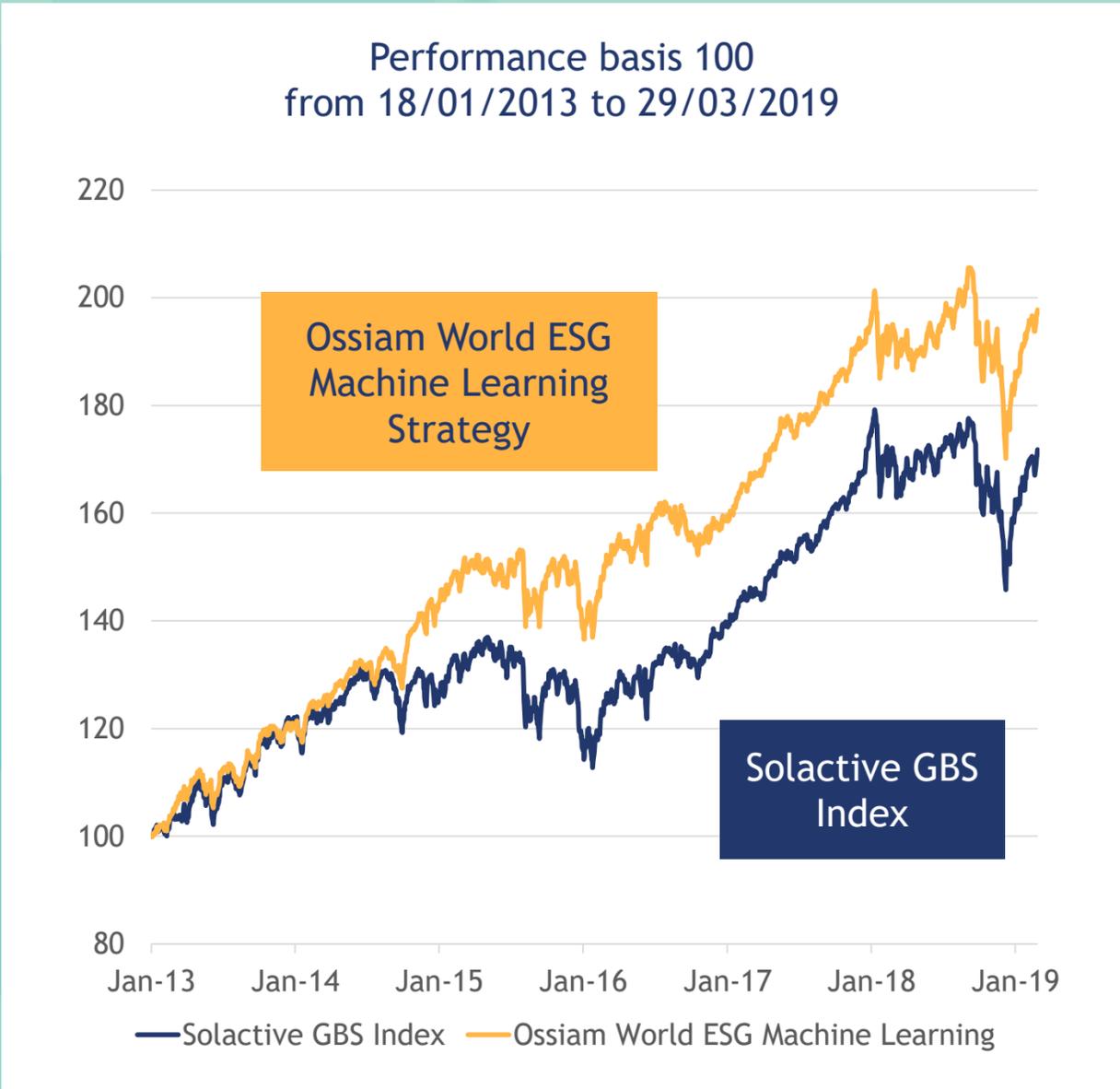
(around 120 stocks)

- Diversification constraint (Max per stocks 3.5% / Max per sector 20% / Herfindahl at 80)
- Targeted portfolio's ESG score 10% higher than the benchmark
- Carbon reduction objective of 40%

OSSIAM WORLD MACHINE LEARNING ESG



Ossiam World ESG Machine Learning Strategy: Performance and Risk



Performance and risk parameters
from 18/01/2013 to 29/03/2019

	Ossiam World ESG Machine Learning Strategy	Solactive GBS Index
Annualized performance	11,73%	9,15%
Annualized Volatility	9,28%	10,70%
Maximum drawdown	-17,23%	-18,67%
Sharpe Ratio	1,19	0,80
Alpha	4,42%	

Source: Ossiam, Solactive, Sustainalytics, Trucost. Calculations in USD. The performance data detailed in this presentation is strategy performance; it does not reflect the performance of the investment vehicles. Performance are net of charges. Performance data reflects the calculations made by Ossiam on the basis of backtest data. The model assumes reinvestment of net dividends and is presented net of charges. Backtested performance results do not represent the performance of actual trading using client assets, but are achieved by means of the retroactive application of a model. Backtested performance suffers from several limitations, namely they are constructed based on hindsight, and material economic and market factors, as well as client will, may have affected investment decisions differently without such hindsight. Additionally, they do not reflect the impact of actual portfolio trading, which could have affected the price and availability of securities, as well as the transaction fees paid. Past performance is not a reliable indicator of future results. Please note that if the currency of a strategy is different for the currency of one's reference area, its performance may be affected by the exchange rate fluctuations (both upward and downward).

Ossiam World ESG Machine Learning Strategy

Performance and risk parameters from 18/01/2013 to 29/03/2019

	Ann. Performance	Ann. Volatility	Max. Drawdown	Sharpe Ratio
Solactive GBS Index	9,15%	10,70%	-18,67%	0,79
ESG Filtered Benchmark	9,28%	10,76%	-18,20%	0,80
RISK ML	5,91%	11,16%	-24,84%	0,47
OPPORTUNITY ML	12,11%	11,91%	-20,27%	0,96
Ossiam World ESG Machine Learning	11,73%	9,28%	-17,23%	1,19

The effects of portfolio construction



ESG exclusion filters do not modify performance and risks



Opportunities from ESG Machine Learning significantly improve returns and drawdowns when compared to the RISK selection



Minimum Variance further reduces risk while keeping similar returns

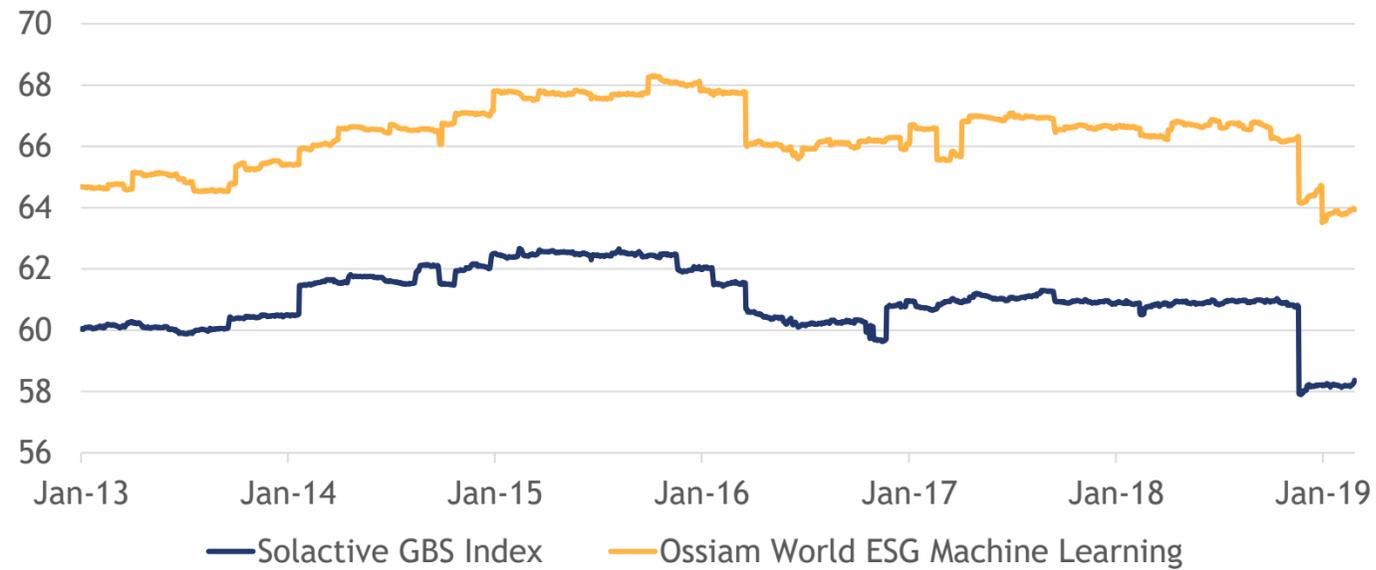


By combining Machine Learning selection (alpha boost) and Minimum Variance portfolio construction (risk mitigation) we get the best of both, which is shown by the highest Sharpe ratio

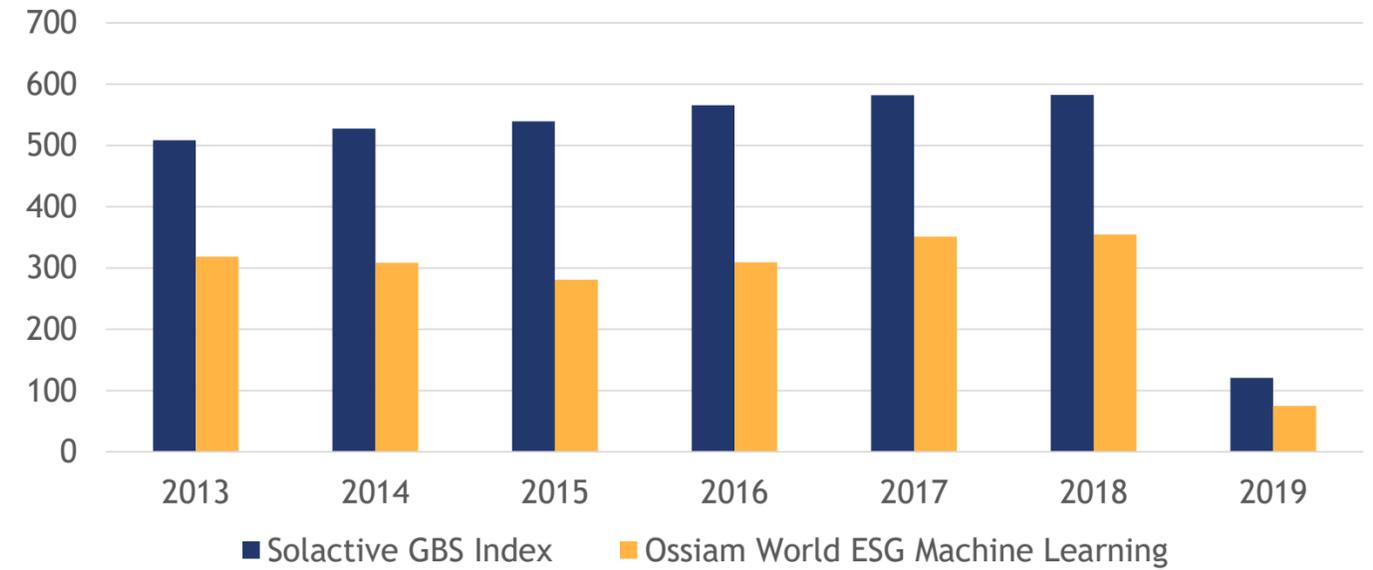
Source: Ossiam, Solactive, Sustainalytics, Trucost. Calculations in USD. Performance are net of charges. The performance data detailed in this presentation is strategy performance; it does not reflect the performance of the investment vehicles. Performance data reflects the calculations made by Ossiam on the basis of backtest data. The model assumes reinvestment of net dividends and is presented net of charges. Backtested performance results do not represent the performance of actual trading using client assets, but are achieved by means of the retroactive application of a model. Backtested performance suffers from several limitations, namely they are constructed based on hindsight, and material economic and market factors, as well as client will, may have affected investment decisions differently without such hindsight. Additionally, they do not reflect the impact of actual portfolio trading, which could have affected the price and availability of securities, as well as the transaction fees paid. Past performance is not a reliable indicator of future results. Please note that if the currency of a strategy is different for the currency of one's reference area, its performance may be affected by the exchange rate fluctuations (both upward and downward).

ESG and Carbon results : Ossiam World ESG Machine Learning Strategy

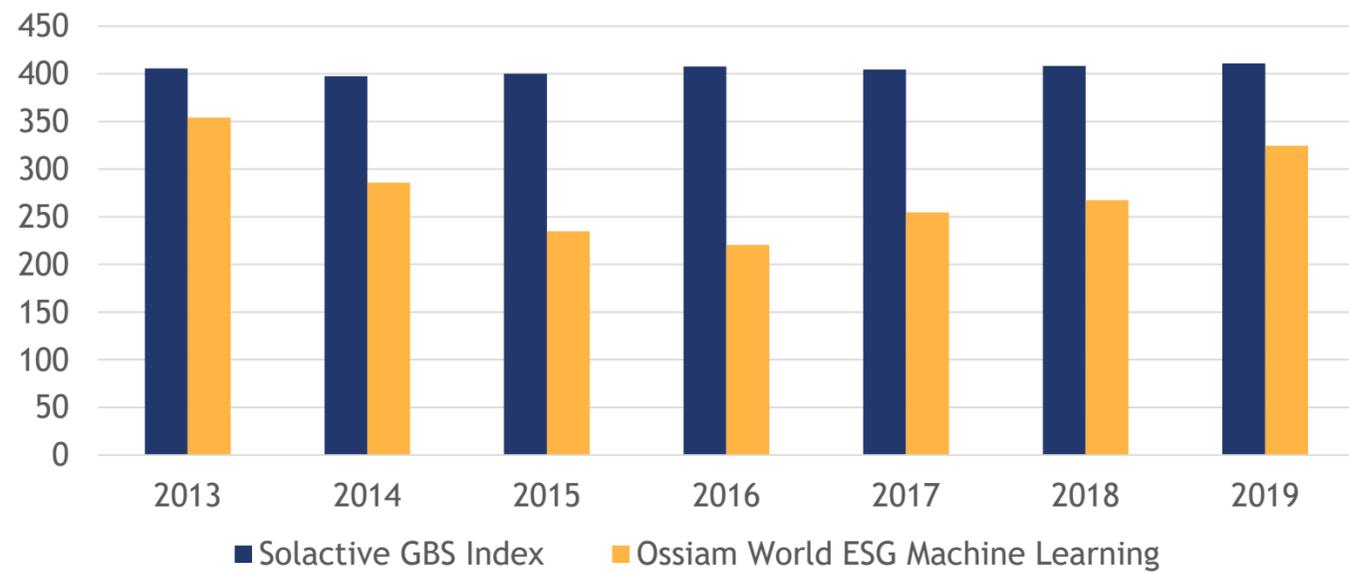
ESG Scores



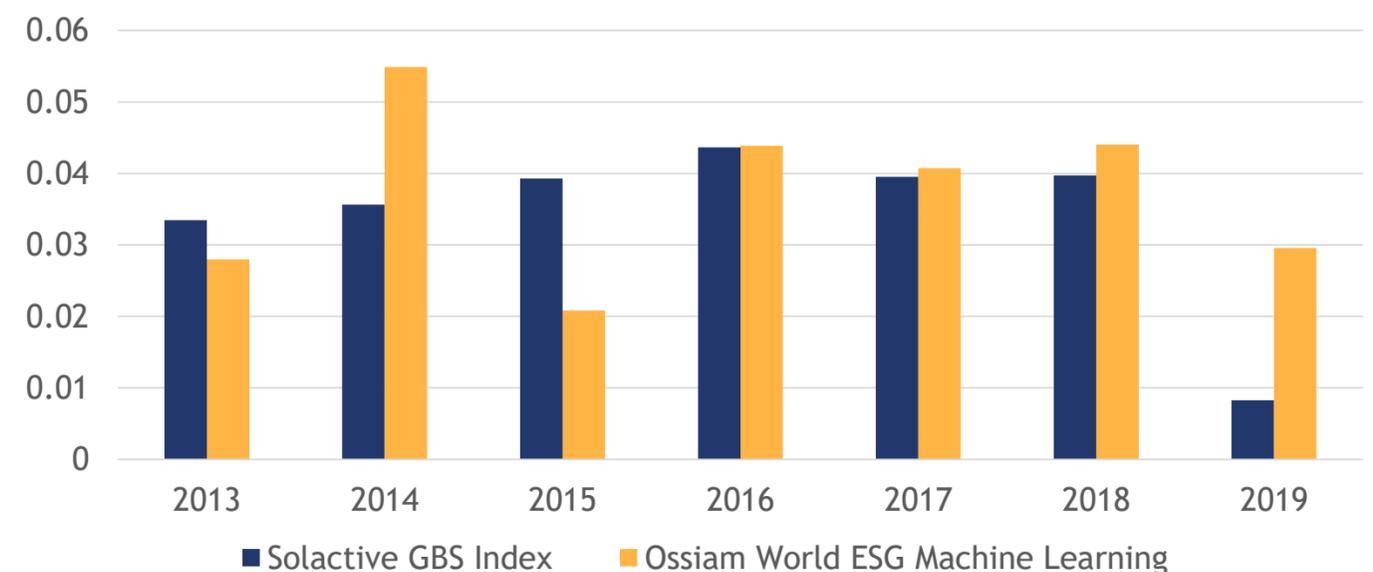
GHG Emissions (Scope 1+2+3) in tCO2



GHG Intensity (Scope 1+2+3) in tCO2/m USD



Renewable Energy Production in GWh



Source: Solactive, Datastream, Sustainalytics, Trucost. Calculation by Ossiam in USD. The performance data detailed in this presentation is strategy performance; it does not reflect the performance of the investment vehicles. Backtested performance results do not represent the performance of actual trading using client assets, but are achieved by means of the retroactive application of a model. Backtested performance suffers from several limitations, namely they are constructed based on hindsight, and material economic and market factors, as well as client will, may have affected investment decisions differently without such hindsight. Additionally, they do not reflect the impact of actual portfolio trading, which could have affected the price and availability of securities, as well as the transaction fees paid. The sector breakdown is as of the dates indicated and is subject to change and should not be relied upon as current thereafter. **The carbon footprint figures and ESG scores are as of the dates indicated and is subject to change and should not be relied upon as current thereafter.**

Conclusions

Investors should be aware that filtering and selecting top ESG rated companies is not necessarily a way to enhance returns.

ESG ratings are aggregated scores that miss significant pieces of information regarding the strengths and weaknesses of companies. They also systematically underweight those indicators that could potentially have an impact on their business models (materiality).

Our Machine Learning algorithm, through the intermediation of a Panel of Experts, identifies ESG patterns and profiles related to financial performance.

It exploits granular and derived variables from ESG data sets, selecting what is really material for companies from an ESG perspective and **learns** over time.

Combined with a Minimum Variance approach for risk mitigations, we show how it is possible to complement financial objectives with ESG integration, by delivering significantly better financial results.



Being exposed to the equity market, the strategies presented may be volatile. It must be made clear that investors may lose their investment entirely.

Investors will be exposed to ESG Investment risks and depending on the reference market of the strategies, they may be exposed to geographical concentration risk.

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