

INNOVATION LABS » SOFIA:

Investment Algorithms



BME Inntech offers four investment algorithms. Another one is under development:

Algorithm	State	Benchmark	% Long	Alpha*	Annual Return**	Operations/Y
Oscillator Allocator	Available	Ibex 35 (stocks)	< 100%	5,6% - 7,0%	10,8% - 12,1%	70 - 90
Sword Allocator	Available	Ibex 35 (stocks)	= 100%	4,3% - 7,1%	10.5% - 12.4%	250 - 300
Shield Allocator	Available	Ibex 35 (stocks)	= 100%	5,4% - 6,3%	10,8% - 11,8%	100 - 110
Rotador Sectorial	Available	Stoxx600 (ETFs)	< 100%	2,8%	5,74%	40 - 50
Rotador Sectorial	Under Dev.	Stoxx600 (Futures)	= 100%	Pending	Pending	Pending

* It shows the average annual excess return over the benchmark. These results are shown both with and without the effect of the Tobin tax

**Average annual return. These results are shown both with and without the effect of the Tobin tax

Algorithms Behaviour

Some of these algorithms are 100% long, while others dynamically increase or reduce their cash position. It is important to highlight the effect this has on the algorithm performance.

Those algorithms not fully invested try to adapt their level of cash depending on the market expectations. They tend to reduce their cash position when they expect the market to go up, and it sells some of their positions during market downturns. In the end, these algorithms try to have a upside capture ratio of 80-100%, and a downside capture ratio of 20-40%. As a result, they follow the benchmark during periods of positive returns, but if also offers capital protection during market downturns. This is how they generate excess return (Alpha).

The others follow the benchmark in both directions. Therefore, they may behave better in a bullish market, but they also tend to experience the same declines as the benchmark.

Both types show good performance over mid-term periods, but they generate their excess return in both different ways and moments. Thus, it may be better to invest in both at the same time. This reduces the volatility of Alpha generation, although their results are similar over periods of three or more years.

Correlation of Algorithms Performance and Alpha Generation

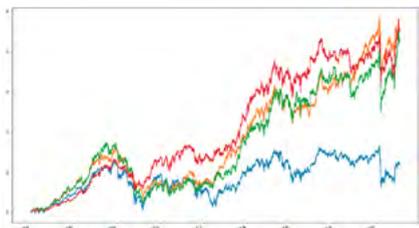
As stated before, it is more profitable to invest in both types of algorithms at the same time. Due to their lower correlation in performance, the investor can effectively generate additional revenue on a recurrent basis. This applies when using a hedging strategy to protect against market risk. However, their results are similar over periods of three or more years.

Oscillator Allocator – Sword Allocator: 0.39 correlation
Oscillator Allocator – Shield Allocator: 0.34 correlation
Sword Allocator – Shield Allocator: 0.80 correlation

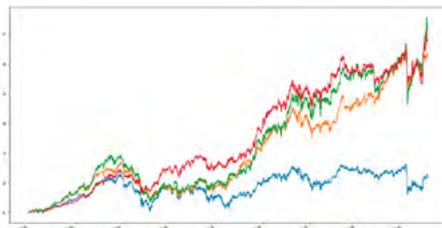
Algorithms Performance

These charts below show the algorithms performance. The Tobin tax will be in force from 2021, but the chart on the left side captures the impact of this tax over the entire period (2004-2021).

With Tobin Tax Effect



Without Tobin Tax Effect



Red: Sword Allocator (100% Long)
Green: Oscillator Allocator (<= 100% Long)
Orange: Shield Allocator (100% Long)

The benchmark (IBEX Total Return) doubles your initial investment over the period, while the algorithms multiply your investment up to seven times (six times in case Tobin tax applies).

Fee Structure

The algorithms follow a special type of performance-based fee structure. Performance fees are calculated over the excess return (Alpha) generated. The strategies are compared against their respective benchmark (total return index, including dividends).

Fee structure, depending on the assets under management (AUM):

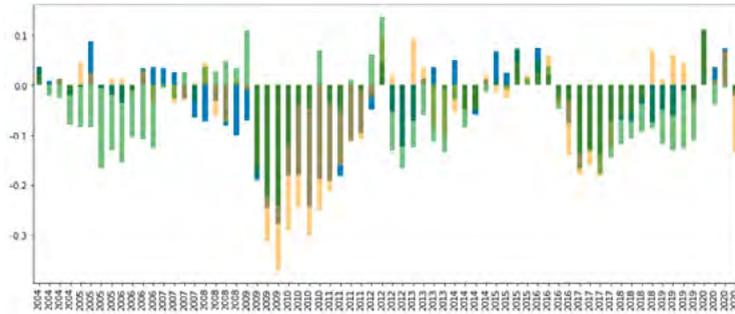
- From 1* to 2 Million €: 50% of the Alpha generated
- From 2 to 10 Million €: 40% of the Alpha generated
- From 10 to 30** Million €: 30% of the Alpha generated

*Minimum investment.

** Maximum investment.

A high-water mark applies to all strategies. No further fees are charged until the Alpha generated reaches a new peak.





Blue: Sword Allocator (100% Long)
Green: Oscillator Allocator (<= 100% Long)
Yellow: Shield Allocator (100% Long)

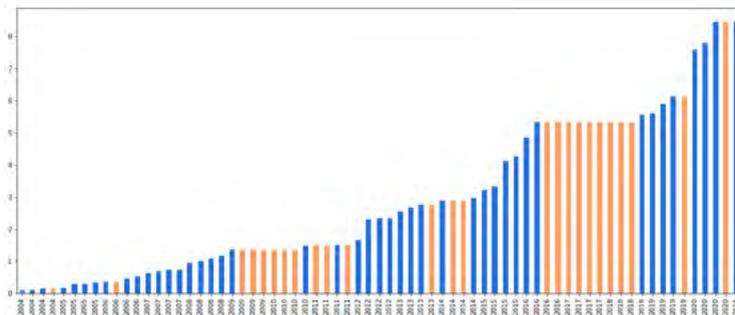
The blue bars represent quarters in which new all-time highs have been reached, generating profits for both parties. The orange lines represent those quarters in which the algorithms have not generated value, as they are not at all-time highs.

Not only has the generation of value remained constant (over three-year periods), but the accumulated benefit that resulted from the Alpha generations amounts to almost 9 million € (initial investment of 1 million € in these three algorithms).

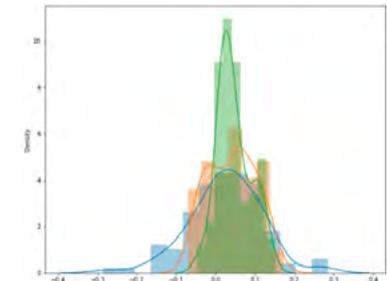
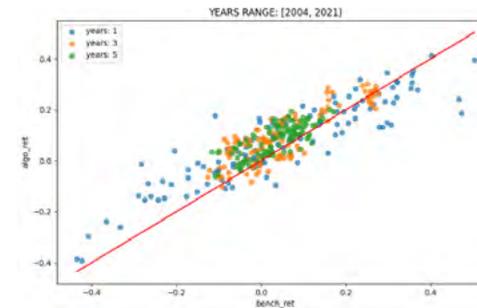
This represents the maximum drawdown in quarterly turnovers (it applies both the Tobin tax and the high-water mark). It highlights the advantage of being invested in both types of algorithms at the same time. In many of the quarters the algorithms reach a new peak of Alpha generation, which is beneficial for both parties. There are only two short periods where neither algorithm is at all-time highs.

Alpha Generation Bootstrapping

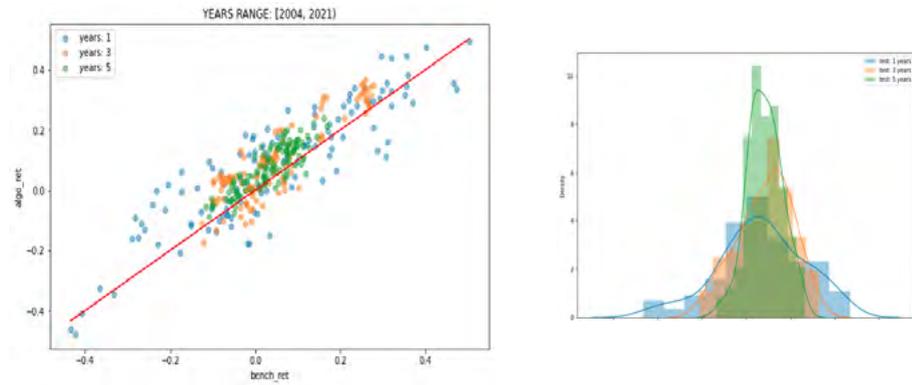
Generating Recurrent Revenues



Oscillator Allocator



Sword Allocator

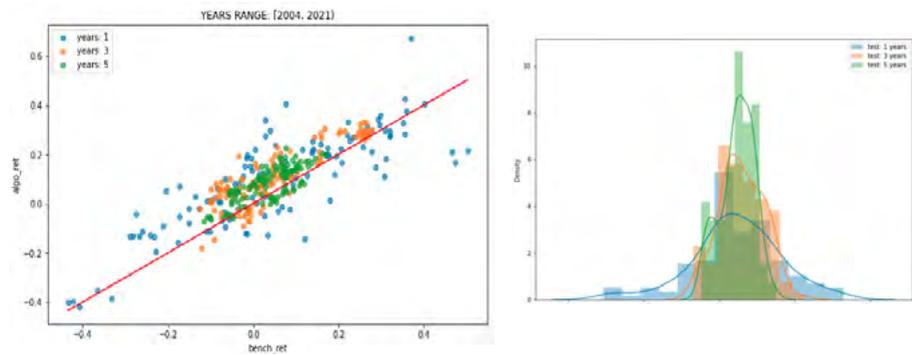


Annual returns over random periods of one, three and five years (for both the algorithm, Y-axis, and the benchmark, X-axis). Each of these values represent different experiments with their own configuration. These are the results obtained on the test set.

The strategy shows excess return in most periods. Besides, the Alpha generation volatility is reduced over longer periods.

Annual excess return. These three distributions have a positive mean, and their standard deviations are reduced over longer periods. This leads to Alpha generation, as stated before.

Shield Allocator



BME innotech

For more information, please contact:

inntech-sales@grupobme.es

www.bmeinntech.es

Tel. +34 91 709 5781- 5773

Plaza de la Lealtad, 1
Palacio de la Bolsa - 28014 Madrid

