

Risk, Return and Sustainability

Qontigo ESG Target Indices Provide an Optimal Solution

Melissa Brown, Managing Director, Qontigo Applied Research



Contents

1.	Introduction	3
>	1.1 Available STOXX ESG Index Approaches	3
>	1.2 Optimization	3
2.	ESG Target Indices	4
>	2.1 Risk Breakdown, Average ESG Score and Carbon Emissions	4
>	2.2 Realized Results: Low Active Risk and Better Returns	7
3.	Conclusion	9
4.	Contacts & Information	10
>	Americas	10
>	Europe	10
>	Asia Pacific	10

1. Introduction

While sustainable investing is not a new concept, its growing popularity means a sharper focus is needed on how to achieve sustainability goals without sacrificing returns or taking on too much unintended risk.

At Qontigo, we believe strongly that paying attention to a company's ESG policies and practices is *additive* to risk-adjusted returns, and our indices have proved this is the case. However, we also understand that some investors are looking to maximize portfolio efficiency: they want the highest possible return for a given level of risk, or to find the lowest-risk portfolio that gives them a desired return. Sustainability adds a third "non-financial" leg to this stool: investors who believe as we do in the importance of sustainability in driving future returns and/or in lowering portfolio risk use sustainability expectations as the measure of return in the equation.

There are numerous ways to construct portfolios, of course. In most cases, the decision on what stocks to hold and how to weight them is based on their risks and expected returns. Sustainable investing can add a third dimension such as an ESG ranking or level of carbon emissions; alternatively, sustainability data may be a primary driver, taking the place of expected return.

1.1 Available STOXX ESG Index Approaches¹

One popular approach is to simply exclude the worst offenders or those companies that fail to meet certain criteria, as we do in our ESG-X and Broad Market indices. Here the portfolio "punishes" the worst actors, but otherwise aims to hew close to the market. As a result, it may mitigate some of the additional risk brought on by companies that, perhaps, are polluting rivers or treating their employees poorly. Investors may not necessarily expect to see additional returns from the positive players but can still be assured that they are making a difference, while at the same time cutting the extreme risk events associated with identified "worst actors."

Alternatively, one can build a portfolio that consists solely of those companies with the most positive ESG scores, thus rewarding companies that focus on sustainability. While this method of portfolio construction may maximize exposure to the best names, it may also stray too much from the broad equity market benchmarks for some investors' comfort. Of course, even this heuristic approach can impose constraints on undesired sources of risk, such as sectors or countries, and hence reduce the potential return deviation from the underlying market index.

1.2 Optimization

For those investors seeking to maximize efficiency who believe that they can benefit from both extra return and risk mitigation, a third option – **optimization** – is an effective tool. This approach is widely used by professional investors to construct portfolios that maximize efficiency, or return, per unit of risk. It does so by limiting deviations from the benchmark that might lead to unintended or undesired exposures.

Optimization is a fancy word for a methodology that allows us to consider virtually all combinations of assets and discover which one will give us the highest level of sustainability for our desired level of risk or, alternatively, minimize the risk for our desired level of sustainability. It assures us there is no "better" possible portfolio that will attain these goals. By taking into account the return expectations for and volatility of each

¹ <https://qontigo.com/solutions/sustainable-investment-index-solutions/>

asset, plus the correlation between them, optimization can very quickly determine the outcome of thousands (or millions) of combinations of assets, far beyond what our brains are capable of. An optimizer also recognizes that one risk (say, an exposure to momentum) can offset another (e.g., a value tilt), and that reducing risk in this way can lead to a higher exposure to the desired source of return per unit of risk. Finally, we can be reasonably sure that our portfolio's return will not stray too far from that of its underlying benchmark, either because we have explicitly specified our maximum tolerance for that deviation or because we have minimized the expected level.

2. ESG Target Indices

We have chosen to use optimization as the methodology for our **ESG Target** family of indices. We first define the universe of eligible stocks, starting with a broad, familiar benchmark. The selection universe excludes stocks of companies that, for example, produce controversial weapons or are military contractors. We also omit the 20% of stocks in each ICB sector with the lowest ESG scores. In addition, in the case of our DAX ESG Target Index, we add stocks from outside the DAX that have better ESG scores; this ensures sufficient choices are available to reach our desired target number of securities (currently 30; this will change to 40 as from September 2021).

Once we have defined our investment universe, the next step is to run the optimization. Our goal is to maximize the ESG score and, in the case of the DAX ESG Target Index, at the same time to reduce the carbon intensity of our portfolio by 30% compared to the DAX benchmark. Since we also do not want our returns to vary too widely from those of the DAX, we impose an ex-ante tracking error constraint of 1.5%. With this risk constraint, we would expect the ESG Target Index return to be within 1.5% of the DAX return roughly two-thirds of the time². We also add constraints on the maximum turnover allowed, individual security weights and sector exposures. We rebalance the portfolio four times a year; see the "[Guide to DAX Strategy Indices](#)" for more details. While we could follow a more heuristic approach, the optimizer allows us to specify our risk target and ensure that we have achieved the best possible diversification.

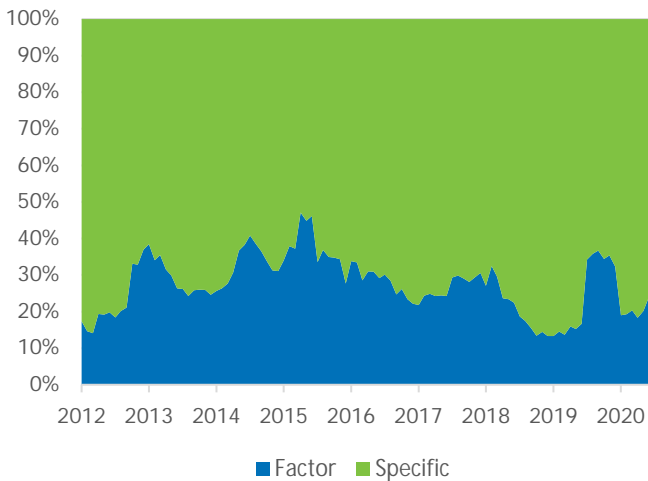
DAX[®] ESG Target

The objective of the DAX ESG Target Index is to reflect the DAX Index while maximizing its ESG score and at the same time reducing its carbon intensity by at least 30%. The predicted tracking error is constrained with respect to its parent index. The index employs ESG exclusion filters for Global Standards Screening, Controversial Weapons, Thermal Coal, Tobacco, Nuclear Power, Military Contracting, Small Arms and Oil Sands.

2.1 Risk Breakdown, Average ESG Score and Carbon Emissions

The final result – by design – is a portfolio with a higher average ESG score and lower carbon emissions. However, it is also a portfolio for which the optimizer has effectively traded off industry and style factor risks, taking into account their individual volatilities and the correlations between them. Consequently, most of the risk in the portfolio is stock-specific (Figure 1), i.e., it is the risk of the portfolio's holdings over and above their factor exposures. One could presume that at least some of this risk is the "ESG risk" associated with the individual names. Of course, it may also represent other risks specific to the individual stock.

² Since active risk is defined in standard deviation terms, and we assume returns will follow a normal distribution, two-thirds of outcomes should fall within a one standard deviation range. Also note that we expect the return to be within a *two* standard deviation range, -3% to +3%, about 95% of the time. In other words, the portfolio's total return should not deviate too substantially from that of the underlying index.

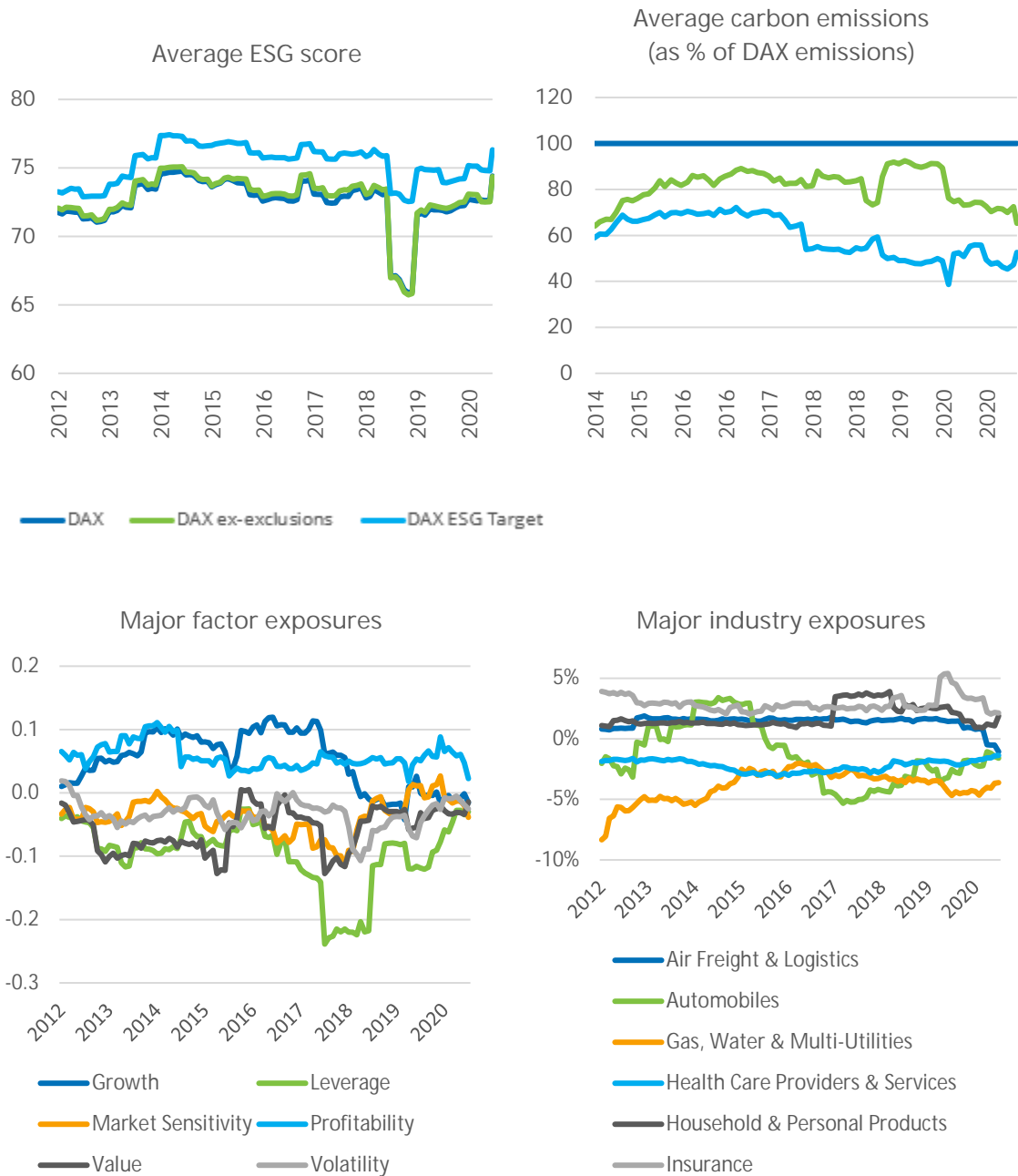
Figure 1. The active risk breakdown for the DAX ESG Target Index versus the DAX

Source: Qontigo

In Figure 2, the left-hand chart shows the average ESG score for the DAX ESG Target Index as compared first with the DAX and second with the DAX minus the excluded stocks. While the excluded stocks do not change the ESG profile substantially, the additional stocks included in the ESG Target Index plus the optimizer's reweighting of other stocks to maximize ESG exposure raise the average significantly. We can also see the benefit of the additional inclusions and optimization in the chart on the right, which shows the additional reduction in carbon emissions.

In our risk analysis, we see that the ESG Target Index takes very small bets on individual style factors. The biggest bets on average are slightly positive tilts toward more profitable and higher-growth companies. The index also has slightly negative bets on Leverage and Value (in other words, more expensive companies with less debt). It is important to note that none of these exposures would be considered large or would be expected to have a substantial impact on return. There are a few industry exposures that are worth noting: the ESG Target Index was overweight Household and Personal Products by about 2% on average, Insurance by roughly 3% and Air Freight by 1.4%; in addition, it was underweight Utilities by almost 4% on average, Health Care Providers by 2.2% and Automobiles by 1.4%.

Figure 2. Average ESG score and carbon emissions

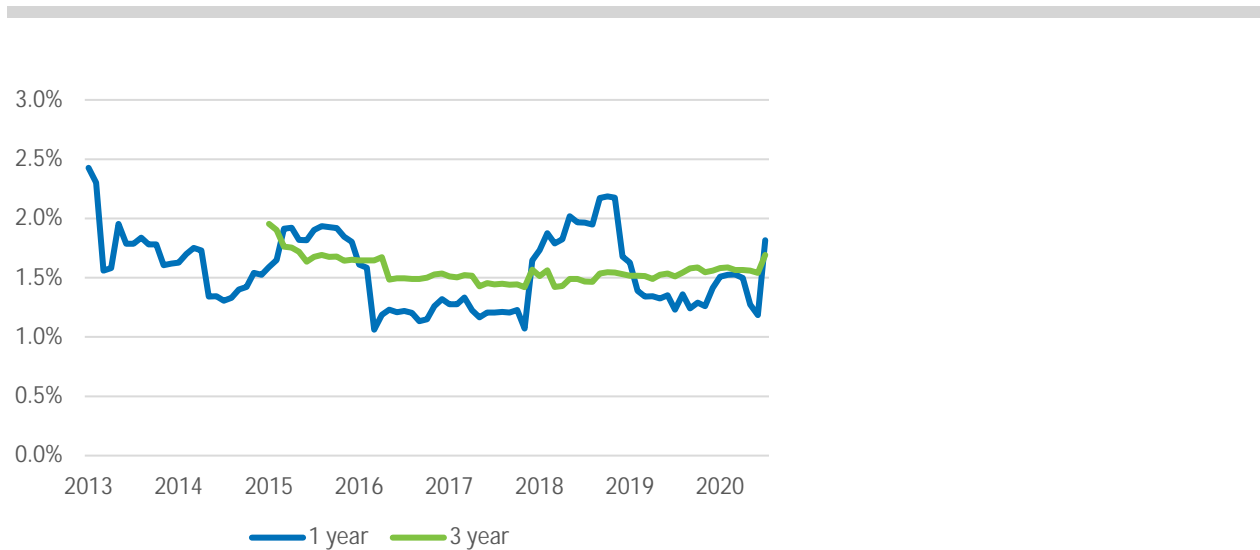


Source: Sustainalytics, ISS ESG and Qontigo

2.2 Realized Results: Low Active Risk and Better Returns

The optimizer achieved its main goal of limiting the active risk. Over rolling one-year periods, realized tracking error hovered between 1% and 2% most of the time, while over rolling three-year periods active risk was consistently very close to target (Figure 3).

Figure 3. Rolling realized tracking error



Source: Qontigo

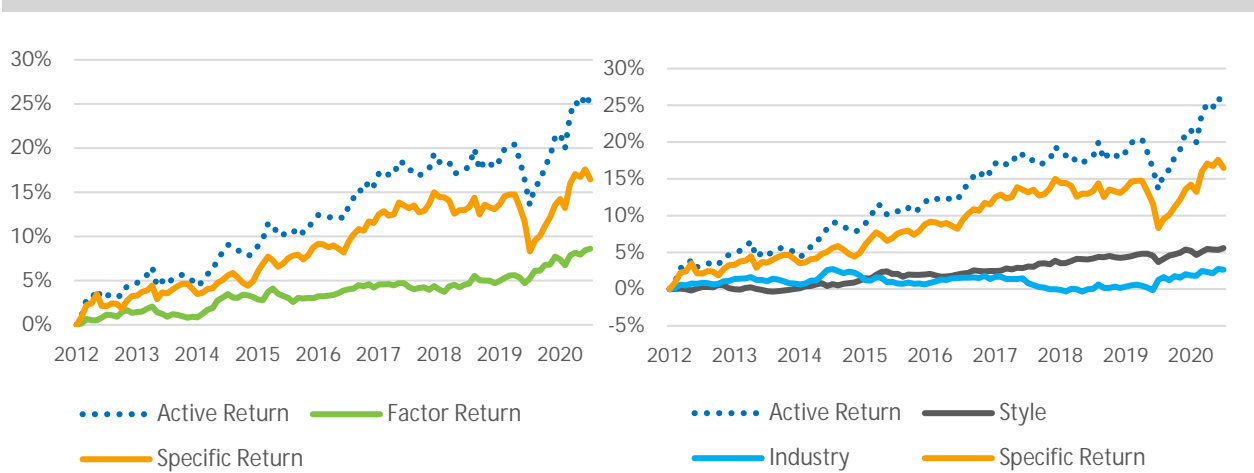
Not only did the portfolio satisfy our risk and return expectations, it also outperformed its underlying benchmark substantially, with an annualized active return of about 1.6%³ and an information ratio of 0.93. A chart of the time series for active return (the dotted lines in Figure 4) also shows consistent outperformance, with the exception of the crisis in 2020.

A further breakdown of active return into the contribution from factors (such as industry tilts or investment style factors, as described above) and the stock-specific contribution (the idiosyncratic return component of each asset, which dominates the portfolio) shows that industry and style contributions were modest but positive, and that most of the active return was stock-specific.

The next, and currently the last, question is whether the stock-specific return came from the outperformance of stocks with better ESG profiles (the index additions and stocks overweights as compared to their weight in the original DAX), underperformance of the exclusions and underweights or, ideally, both of these simultaneously.

³ Based on month-end holdings and monthly rebalancing from October 2012 through March 2021.

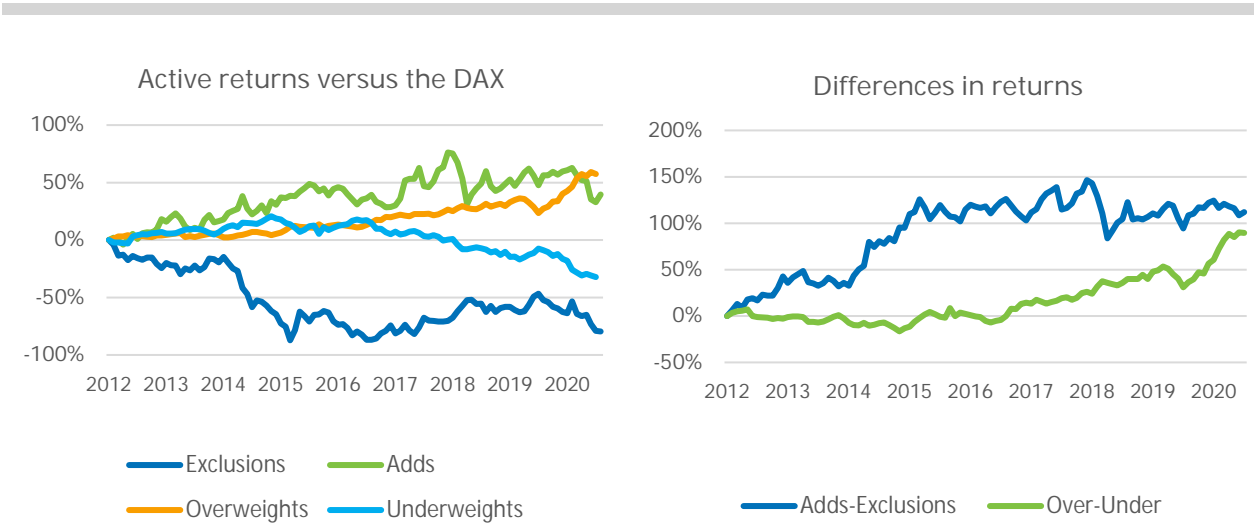
Figure 4. Active return and its components



Source: Qontigo

The left-hand chart in Figure 5 shows that the additions and overweights have generally outpaced the DAX since 2012, while the underweights have lagged. The stocks excluded from the index underperformed over the full period, although this underperformance was concentrated in the first three years of our test period. The chart on the right shows the difference in returns between the additions and the exclusions, and between the overweights and the underweights. The stock reweightings (the result of the optimization) produced more consistent results. Overall, the portfolio clearly benefits from its tilt toward stocks with better ESG scores; it is less clear whether avoiding worse stocks has also boosted returns, although that tactic certainly did not hurt.

Figure 5. Performance of additions and overweights versus exclusions and underweights



Source: Qontigo

3. Conclusion

Optimization is an important arrow in index constructors' quivers. In the case of the DAX ESG Target Index, the optimizer helped create a portfolio that met our ESG and carbon emissions goals while maintaining a steady level of active risk versus the underlying DAX index. The portfolio also steadily outperformed the DAX by emphasizing stocks with more positive ESG scores, either through additions to the index or by overweighting the higher-scoring names. Overall, the ESG scores allowed the index to outperform while the optimizer and risk model kept risk in check, ensuring that both goals were met.

4. Contacts & Information

Learn more about how Qontigo can help you better manage risk and enhance your investment process.

[Qontigo.com](https://www.qontigo.com)

Europe

Frankfurt

Mergenthalerallee 61
65760 Eschborn, Germany
+49 69 2 11 0

Geneva

Rue du Rhone 69, 2nd Floor
1207 Geneva, Switzerland
+41 22 700 83 00

London

11 Westferry Circus
London E14 4HE, United Kingdom
+44 20 7862 7680

Paris

19 Boulevard Malesherbes
75008, Paris, France
+33 1 55 27 38 38

7 Rue Léo Delibes
75116, Paris, France
+33 1 55 27 67 76

Prague

Futurama Business Park Building F
Sokolovska 662/136b
186 00 Prague 8, Czech Republic

Zug

Theilerstrasse 1A
6300 Zug, Switzerland
+41 43 430 71 60

Americas

Atlanta

400 Northridge Road, Suite 550
Atlanta, GA 30350
+1 678 672 5400

Buenos Aires

Corrientes Avenue 800, 33rd Floor
Office 101
Buenos Aires C1043AAU, Argentina
+54 11 5983 0320

Chicago

1 South Wacker Drive, Suite 200
Chicago, IL 60606
+1 224 324 4279

New York

17 State Street, Suite 2700
New York, NY 10004 USA
+1 212 991 4500

San Francisco

201 Mission Street, Suite #2150
San Francisco, CA 94105
+1 415 614 4170

Asia Pacific

Hong Kong

28/F LHT Tower
31 Queen's Road Central
Hong Kong
+852 8203 2790

Singapore

80 Robinson Road, #02-00
Singapore 068898, Singapore
+852 8203 2790

Sydney

9 Castlereagh Street, Level 17
Sydney, NSW 2000, Australia
+61 2 8074 3104

Tokyo

27F Marunouchi Kitaguchi Building,
1-6-5 Marunouchi Chiyoda-ku
Tokyo 100-0005, Japan
+81 3 4578 6688



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