Analytics+

Understand, visualize and deconstruct factor strategies

FTSE Russell

Factor Analysis Tool

Analytics+ is an intuitive, web-based analytical tool that allows users to visualize factor exposures and simulate performance outcomes of single and multi-factor indexes.

Users have the ability to apply and control factor and ESG exposures using any indexes from the FTSE Russell index universe. In addition, they are able to load portfolios to assess factor exposures, overlay additional exposures and analyse key performance drivers.

Leveraging FTSE Russell's innovative "Tilt-Tilt" methodology, users can also design a variety of single and multi-factor indexes and review historical performance, factor, country, industry and ESG exposures, and the relationship to index capacity and levels of diversification.

Performance can be also attributed to systematic and idiosyncratic sources to facilitate an understanding of the sources of index performance.

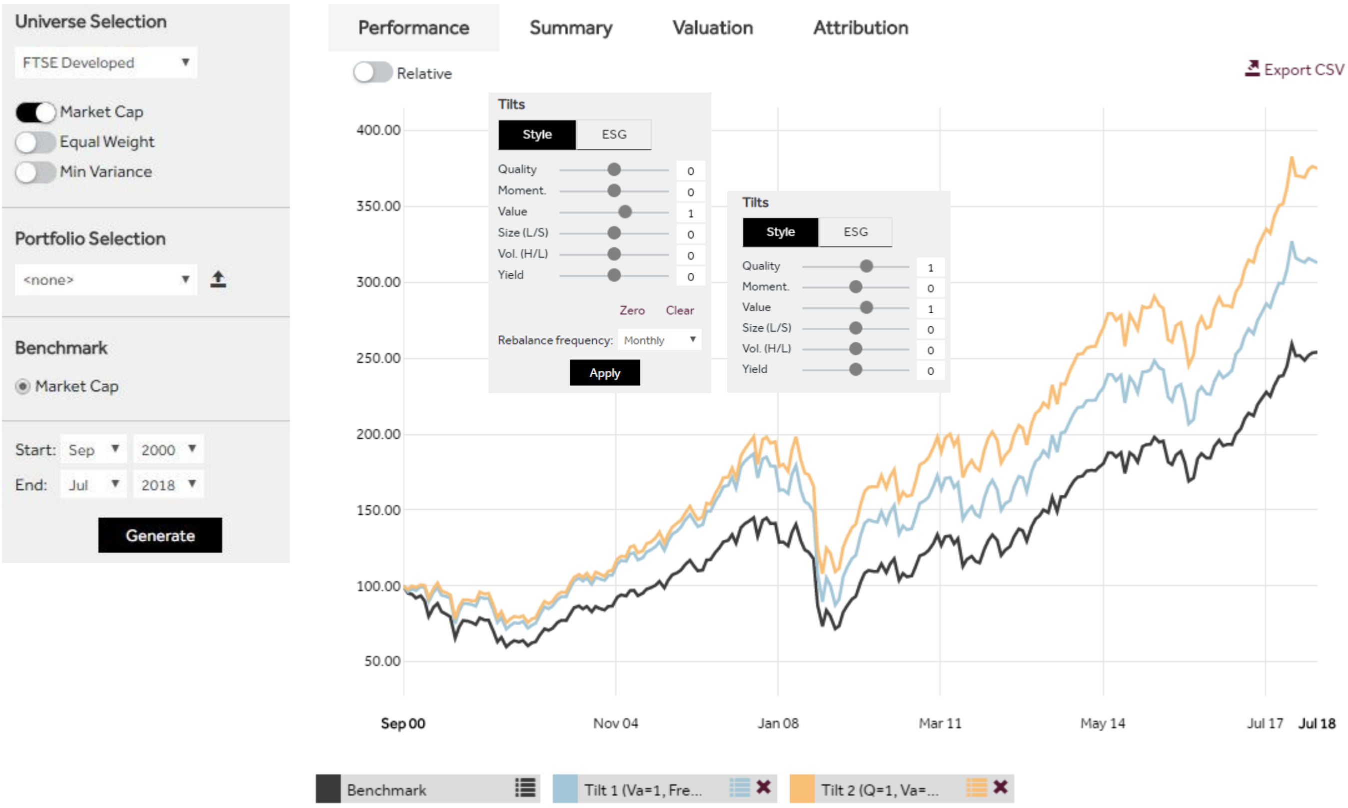
Understand
Factor performance drivers

Visualize
Different combinations of single or multi-factor indexes

Deconstruct
Portfolio or index exposures through a factor lens

Attribute
Active return to factors, industry and country effects

1. Select Universe; 2. Import Portfolio; 3. Apply variable single and multi-factor overlays; 4. Apply ESG overlays; 5. Choose rebalancing frequency; 6. Analyse Results



Source: FTSE Russell, date as at 19 Jul 2018. Monthly performance calculated from third Friday to third Friday. The information displayed is for illustrative purposes only and represents hypothetical rather than actual index performance. Past performance is no guarantee of future results. Please see important legal disclosures at the end of the document.

Performance and Risk Analytics

The tool allows users to analyse absolute and relative performance across both FTSE Russell Benchmarks and user portfolios, and examine active factor exposure and the impact of factor allocation on index Capacity, Diversification, Industry and Country weightings.

The **Summary** tab shows the performance and risk attributes for the benchmark and factor portfolios. These include absolute and relative performance, up and down capture ratios, Sharpe Ratio, Maximum Drawdown, Information Ratio and Tracking Error.

Performance > Summary

Performance | Summary | Valuation | Attribution

		MarketCap Benchmark	Tilt 1	Tilt 2
Index Statistics	Arithmetic Return % p.a.	6.80	8.13	8.89
	Geo. Return % p.a.	5.37	6.61	7.70
	Volatility % p.a.	17.34	18.14	16.78
	Return/Risk Ratio	0.31	0.36	0.46
	Max Drawdown %	-50.51	-53.28	-45.59
	Turnover % p.a.	12.14	84.50	106.84
Relative to Benchmark	Arithmetic Excess Return % p.a.	--	1.33	2.09
	Geo. Excess Return % p.a.	--	1.18	2.21
	Vol. Reduction % p.a.	--	-4.61	3.23
	Information Ratio	--	0.50	0.91
	Tracking Error % p.a.	--	2.38	2.42
	Up Capture % p.a.	--	103.44	100.96
	Down Capture % p.a.	--	98.29	90.15

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Geo. Return % p.a.	5.37	6.61	7.70
Volatility % p.a.	17.34	18.14	16.78
Return/Risk Ratio	0.31	0.36	0.46
Max Drawdown %	-50.51	-53.28	-45.59
Turnover % p.a.	12.14	84.50	106.84

Benchmark | Tilt 1 (Va=1, Fre... | Tilt 2 (Q=1, Va=...

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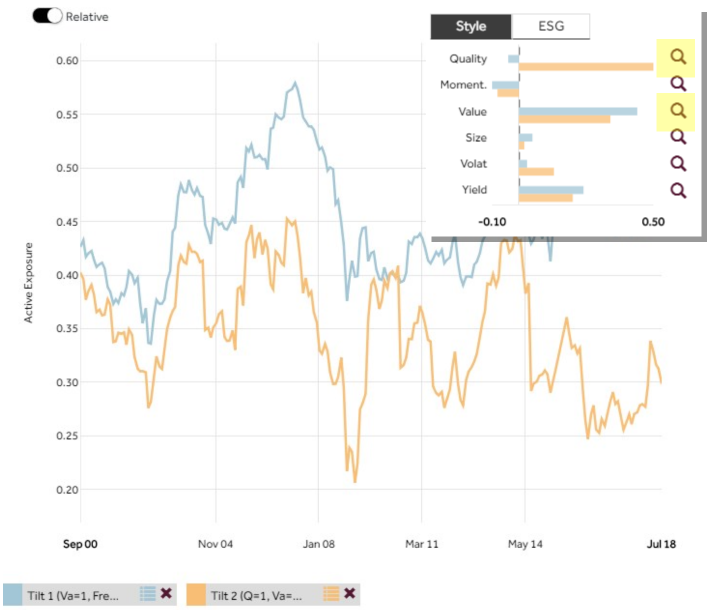
Exposure

Use the **Exposure Box** to view active exposures at a glance. Click on the magnifying glass icon to view historical exposure to individual factors, industries or countries.

"Show All Factors" allows users to view the history of all factor and ESG exposures as well as capacity and diversification on one page. Additional options include a toggle to view all factors relative to the selected benchmark.

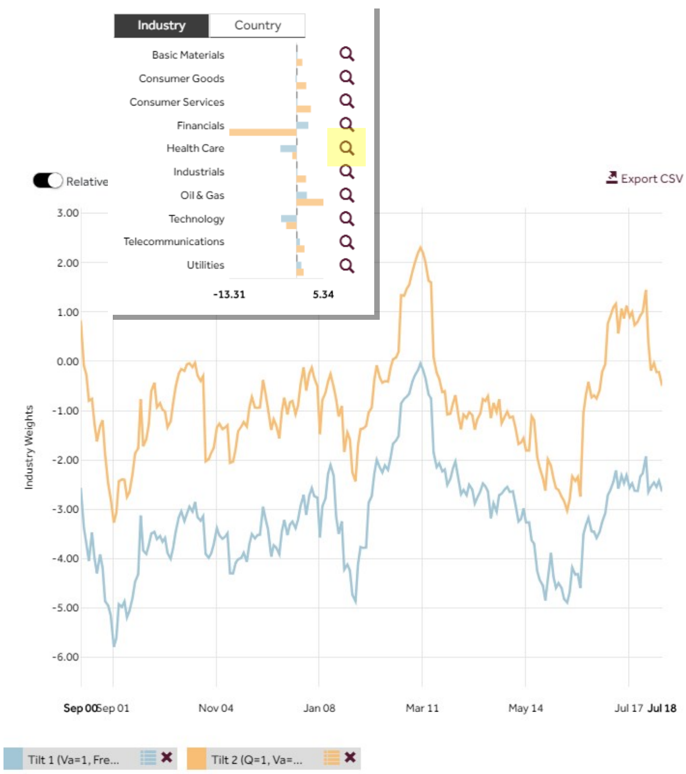
Active Exposure > Value



Active Exposure > Quality

Average Active Exposure > USA

Average Active Exposure > Healthcare



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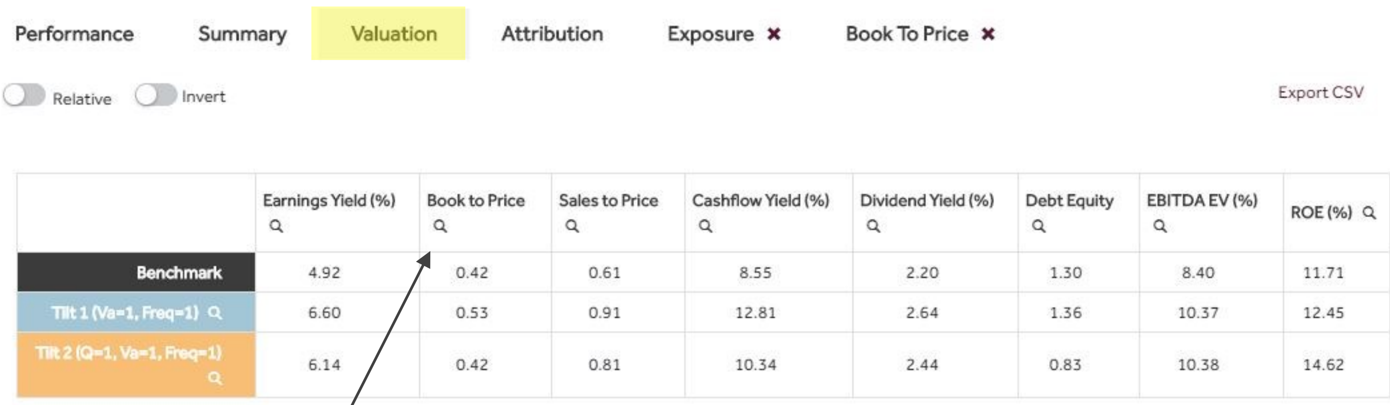
Valuations

The **Valuation** tab shows valuation statistics and fundamental ratios for the benchmark and chosen factor portfolios, viewed on an absolute or relative basis relative to the selected benchmark.

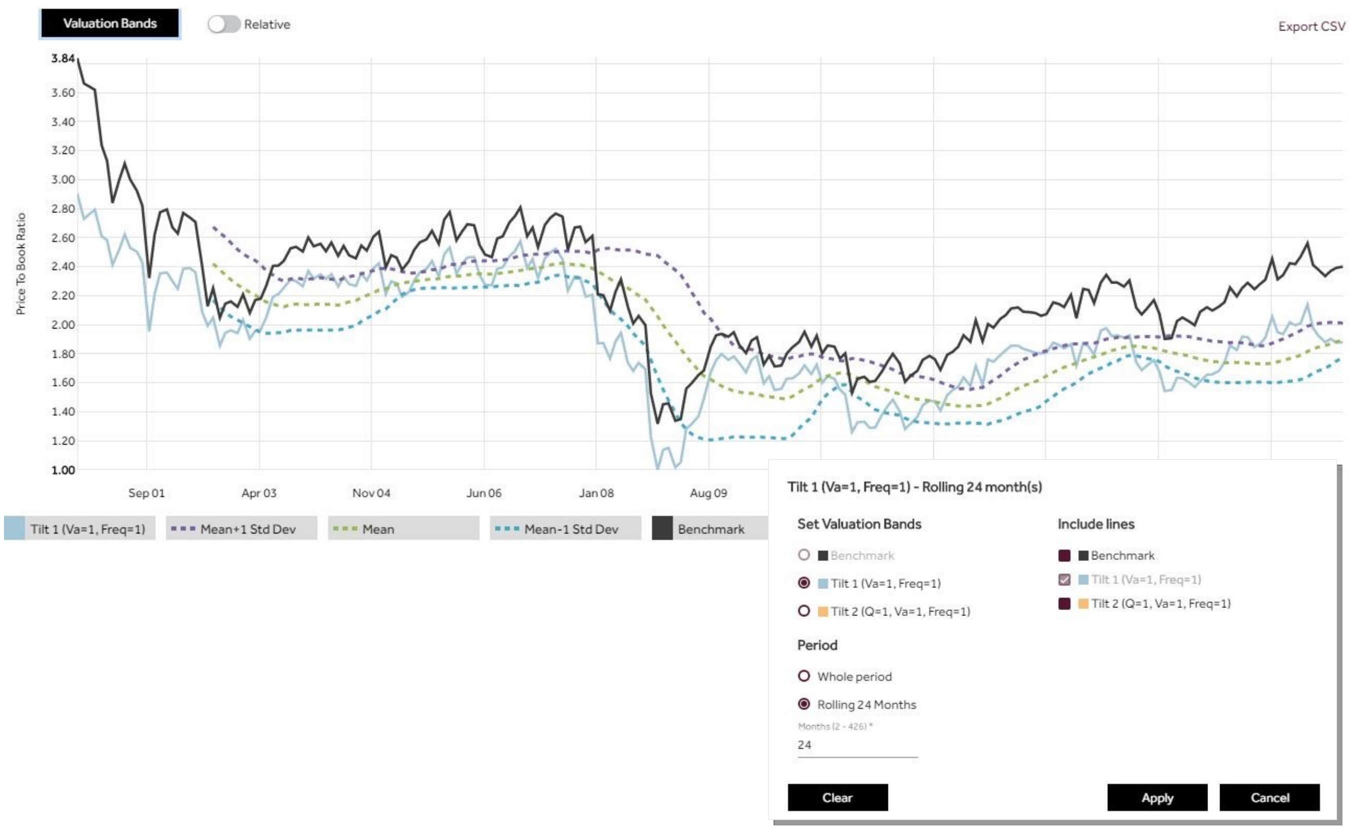
Valuation statistics include: Earnings Yield (%), Book to Price. Sales to Price, Cashflow Yield (%), Dividend Yield (%), Debt Equity, EBITDA EV(%) and Return on Equity (%).

To view historical valuation ratios, click on the magnifying glass.

Valuation



	Earnings Yield (%)	Book to Price	Sales to Price	Cashflow Yield (%)	Dividend Yield (%)	Debt Equity	EBITDA EV (%)	ROE (%)
Benchmark	4.92	0.42	0.61	8.55	2.20	1.30	8.40	11.71
Tilt 1 (Va=1, Freq=1)	6.60	0.53	0.91	12.81	2.64	1.36	10.37	12.45
Tilt 2 (Q=1, Va=1, Freq=1)	6.14	0.42	0.81	10.34	2.44	0.83	10.38	14.62



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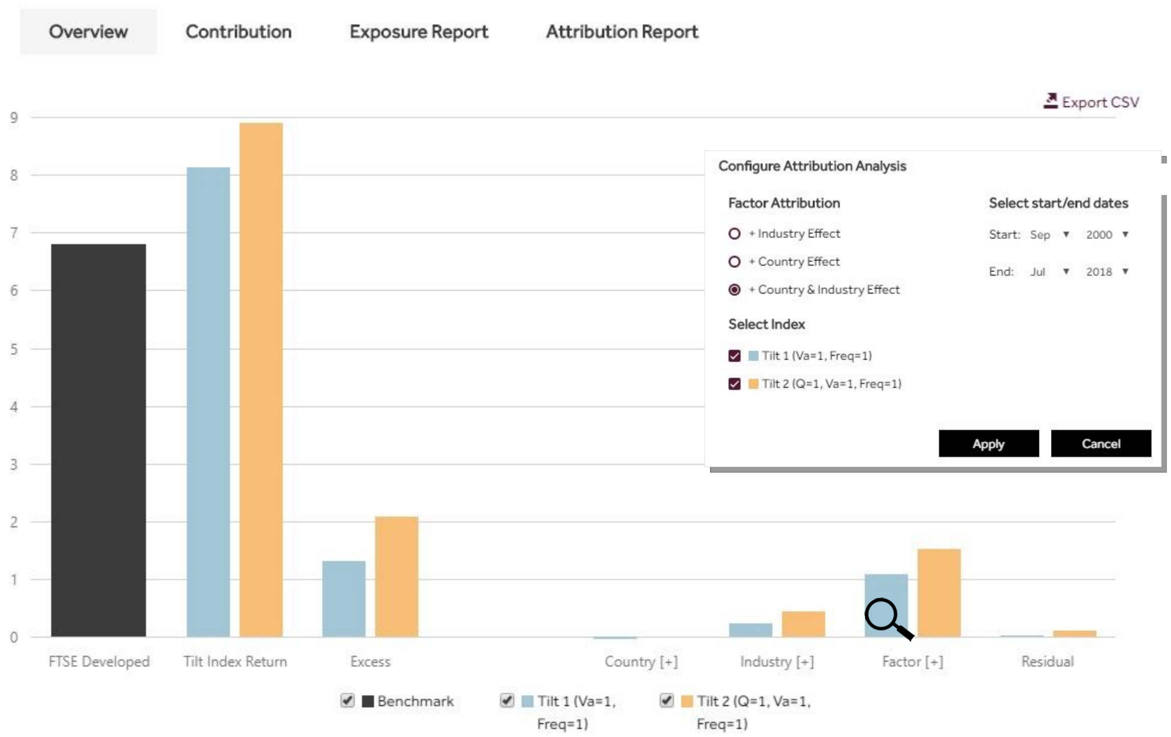
Attribution

Analytics+ allows users to attribute performance to factor, industry and country effects. Factor attribution is particularly relevant to understanding whether a particular index has factor exposures that are aligned with stated index objectives and the extent to which excess performance is determined by those factors.

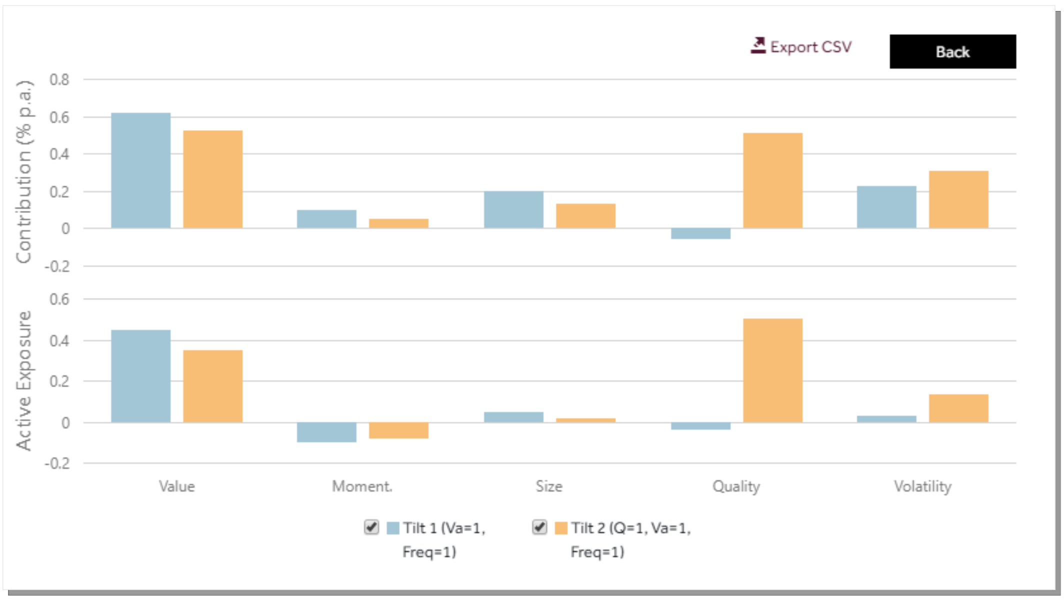
View a more detailed breakdown of the attribution by clicking on the specific factor, industry or country bar.

Attribution > Overview



Attribution > Factor

Detailed Factor Attribution



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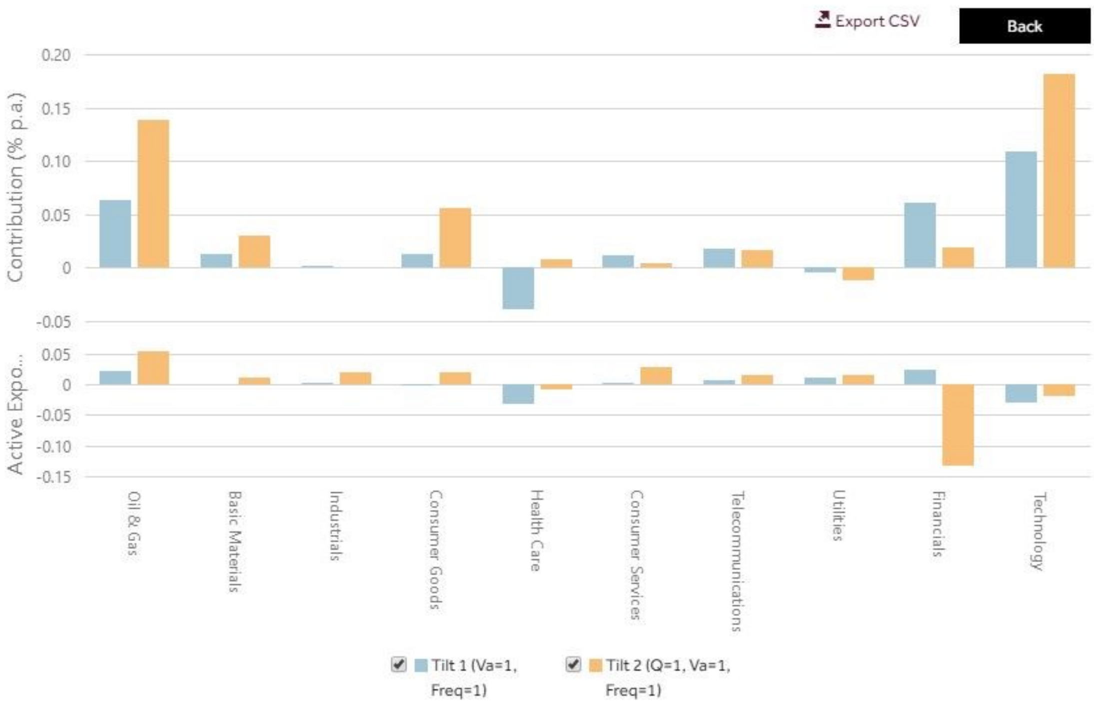
Attribution - Industry/Country

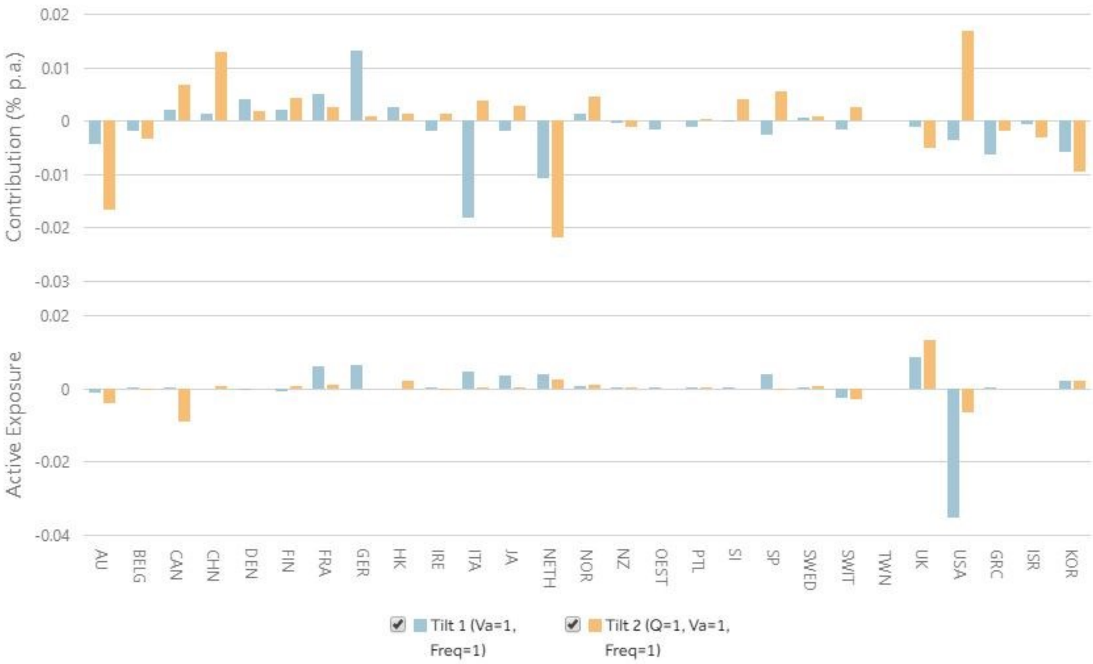
Here is shown the industry and country attribution.

The industry breakdown is calculated using Industry Classification Benchmark (ICB*), a globally recognized standard, operated and managed by FTSE Russell for categorizing companies and securities, with approximately 75,000 securities worldwide classified by the system. See www.icbenchmark.com for more information.

Attribution > Industry



Attribution > Country



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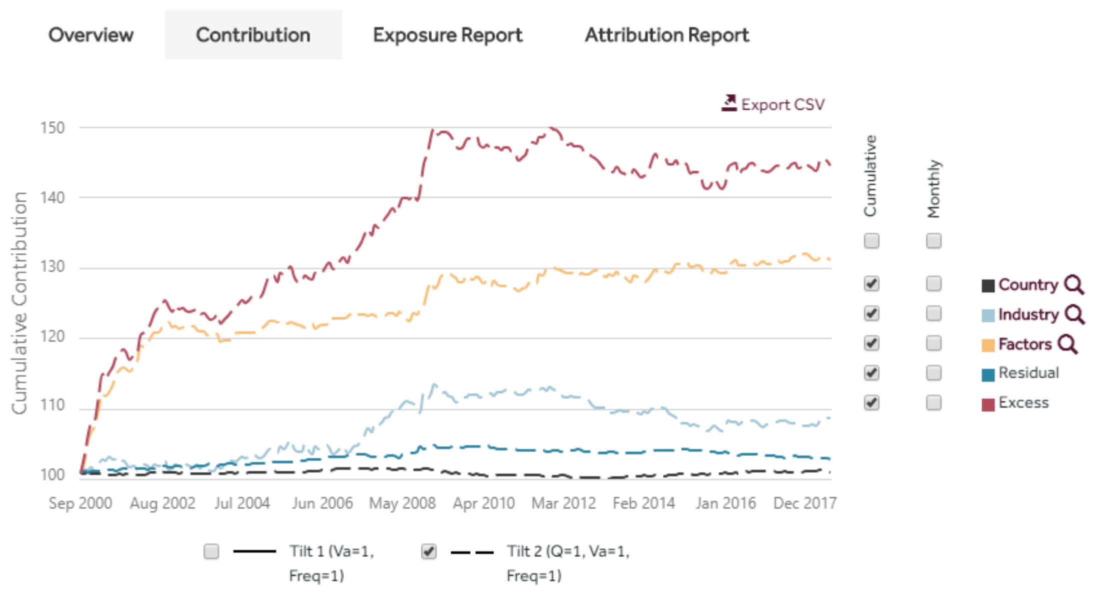
Contribution

Analytics+ also allows the investigation of the historical contribution to performance on both a monthly and cumulative basis.

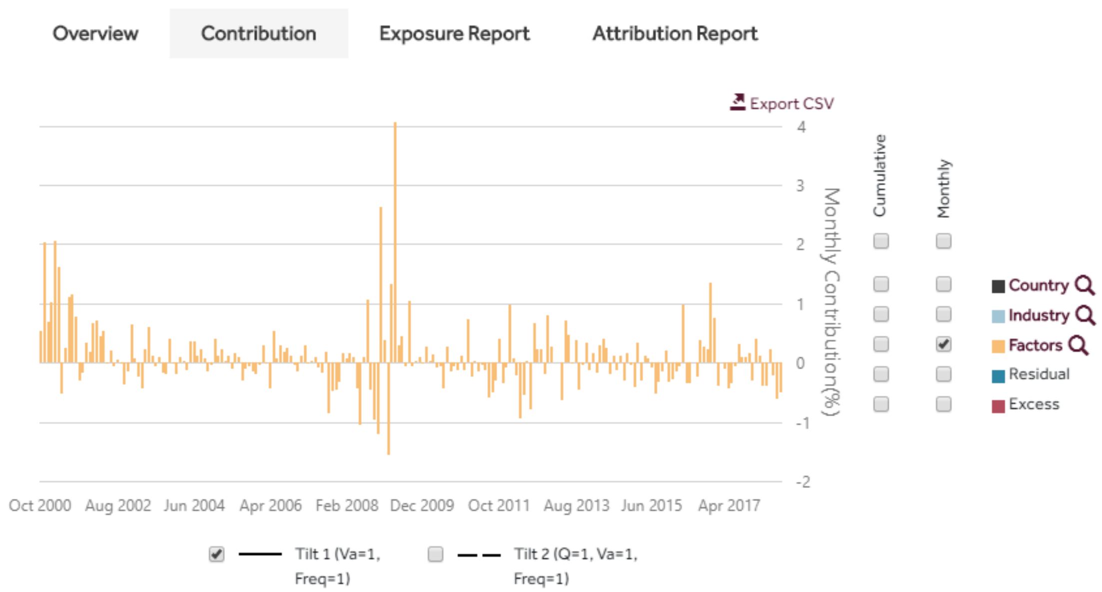
Additional granularity is available to investigate individual factor, industry and country contributions to performance.

Attribution > Contribution

Cumulative Performance Contribution



Monthly Performance Contribution



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Technical Specifications

Inputs		
Investment Universes	FTSE All-World® FTSE Developed FTSE Developed ex US FTSE Asia Pacific FTSE Europe FTSE Emerging	FTSE Japan FTSE USA FTSE 350 ex Investment Trust FTSE Developed ex Korea Russell 1000® Russell 2000® FTSE Australia 300
Factor Tilts	**Value**: Earnings Yield, Cash Flow Yield and Country Relative Sales to Price Ratio **Size**: Log of Full Market Capitalization **Quality**: ROA, Change in Asset Turnover, Accruals and Leverage	**Momentum**: Cumulative 11-month return (ex most recent month) **Volatility**: 5 year standard deviation (weekly) **Yield**: Log of 12mth trailing dividend yield
ESG Tilts	**Overall: Environmental, Social and Governance Scores** **Environmental**: Biodiversity, climate change, pollution and resources, supply chain, water use	**Social**: Customer responsibility, health and safety, human rights and community, labor standards, supply chain **Governance**: Anti-corruption, corporate governance, risk management, tax transparency
Tilt Strength	**Factor, ESG and Macro:** tilt strengths can be modified (dialed up, dialed down or tilted away) to emphasize certain exposures	
Outputs		
Performance	**Performance:** Total and Excess Return, Return/Risk Ratio, Information Ratio, Cumulative Return Chart, Up/ Down Capture	**Risk Analytics**: Volatility, Volatility Reduction, Max Drawdown, Tracking Error
Valuations & Metrics (current and history)	Earnings Yield Book-to-Price Sales-to-Price Cash Flow Yield	Dividend Yield Debt-to-Equity EBITDA/EV ROE
Index Characteristics (current and history)	Factor Exposure ESG Exposure Turnover	Macroeconomic Exposure (US only) Capacity Diversification
Tool Parameters		
Date Range	September 2000-To Date	
Factor Exposure Calculation:	Holdings Based Analysis (Z-score)	
Data Export Functionality:	Yes, where permissioned	
Portfolio Load:	CSV file in sedol/weight/date column format	

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