



Index Research and Design | Index Ideas

Turning the lens: Rotating risk models for insight

June 2025

AUTHORS

Andreas Schroeder

Head of Index Research and Design,
EMEA

andreas.schroeder@lseg.com

Ely Klepfish

Manager, Research, FTSE Russell Index
Research and Design – EMEA

ely.klepfish@lseg.com

Contents

Turning the lens: Rotating risk models for insight.....3

Rotation for alignment3

Enrichment with macro and thematic factors.....5

Stressing volatilities and correlations.....6

Let’s talk about your rotation7

Turning the lens: Rotating risk models for insight

Risk models are foundational tools in modern portfolio management. They help identify where risk is coming from, whether it is excessive, and where performance surprises might originate. Yet despite decades of refinement, the way risk models are used still leaves room for deeper alignment with the actual investment process.

This paper examines a concept we call risk model rotation—a method that can be used to adapt any off-the-shelf risk model to the specific lens of your investment mandate. We'll explore three key ideas:

- Aligning risk model factor structure to your specific investment philosophy
- Enriching the model with additional factors not originally incorporated in the risk model
- Stressing volatilities and correlations to better reflect forward-looking or possible adverse conditions

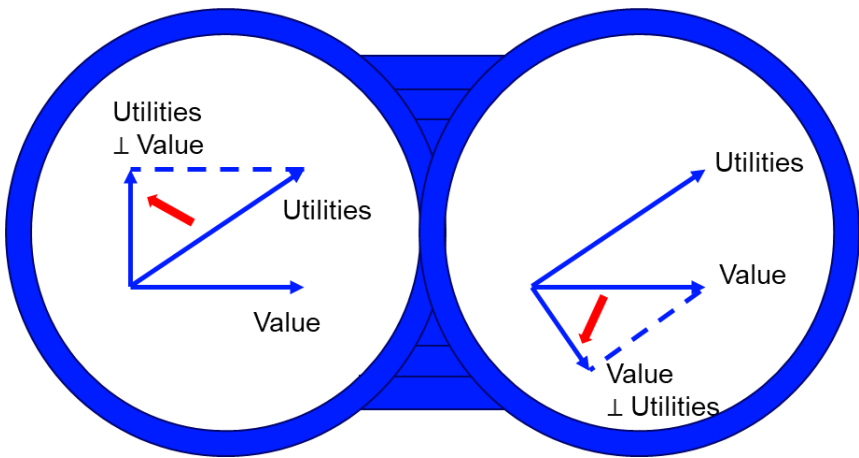
Each of these unlocks a different layer of insight—and together, they help make risk attribution not just more accurate, but more relevant. We'll tease the mechanics, show you what the model looks like, and invite you to explore how much better the new risk attribution captures your investment process.

Rotation for alignment

Risk models come in many shapes, built around sectors, regions, or style factors such as value and size, or derived from purely statistical decompositions. They deploy stepwise procedures to identify hierarchies of factors and the order of their importance to capture risk in the market as well as across a large number of typical portfolios in the best way. But when the investors use these risk models, the goal isn't just to reflect market dynamics—it's to reflect their investment process as well. And that process might be very different from the risk model provider's goal of targeting a broad user base.

Let's look at an example. Suppose you are running a sector-focused strategy—expressing views through stock selection within favoured sectors. In this case, you would want the risk model to attribute risk primarily to sectors, and only secondarily to styles or regions. By contrast, a style-centric investor wants the opposite: risk attribution should focus on styles first, and only then fill in the residuals through sectors and countries.

Figure 1: Factors rotation principle



Source: Index Research and Design, FTSE Russell, June 2025.

Here’s the issue: standard risk models don’t accommodate these nuances. They treat all factors equally, or at least in a fixed hierarchy. That’s where rotation comes in. Our method re-engineers the factor structure by setting an explicit priority — for example, a sector-centric priority order could be Market > Sectors > Styles > Countries — and then orthogonalises each group relative to the higher-priority ones. This conveniently isolates the risk in a way that aligns with the investment process. So instead of letting the model decide how risk is split, you define what comes first. The effect can be dramatic.

In the sector-centric view, sectors absorb more of the systematic risk, pulling common components from countries and styles. In the style-centric view, the same components are attributed to styles first. The total risk hasn’t changed—but what the portfolio manager can see and respond to has.

Table 1: Decomposition of tracking error using unrotated vs. sector-centric vs. style-centric risk model for a FTSE Russell All-World Developed Paris-Aligned Benchmark as of Dec 2024

	Original		Sectors centric		Style centric
Market	0.00%	Market	0.39%	Market	0.39%
Styles	0.91%	⊥ Sectors	1.73%	⊥ Styles	1.15%
Sectors	1.27%	⊥ Styles	0.16%	⊥ Sectors	0.74%
Countries	0.34%	⊥ Countries	0.24%	⊥ Countries	0.24%
Stock Specific	0.87%	Stock Specific	0.87%	Stock Specific	0.87%
Total	3.38%	Total	3.38%	Total	3.38%

Source: Index Research and Design, FTSE Russell, June 2025.

Enrichment with macro and thematic factors

Even the best risk models aren't exhaustive. At times, investors care about exposures that aren't in the default factor set at all. Oil, gold, bond yields, inflation expectations, or even ESG or climate themes — they aren't standard “style” or “sector” factors—but they matter, especially for macro-aware or sustainability-driven investors.

So, our method goes a step further: it enriches a given risk model by introducing new custom factors. This is more than just slapping on a regression—it's a thoughtful integration into the rotation process.

Take for example, climate-aligned portfolios. An investor might want to explicitly include oil as a macro factor. By inserting it before style, sector, or region in the rotation, it will capture systematic oil risk first — rather than leaving it to be buried in residuals or misattributed.

Notice how the model correctly attributes risk stemming from oil as a primary driver of risk. This isn't just clearer—it's actionable. Our method provides insight of where the portfolio stands relative to forces that matter to the investment process.

Table 2: Risk attribution (% of tracking error) to factors orthogonalised with respect to those listed above (⊥), before and after inclusion of macro factors FTSE Russell All-World Developed Paris-Aligned Benchmark as of Dec 2024

		Original	+ Macro
Stock Market	Stock Market	11.5%	11.5%
⊥ Macro	⊥ Oil		11.2%
	⊥ Bonds		1.8%
	⊥ Inflation		0.0%
	⊥ USD		2.1%
	⊥ Climate		
⊥ Industries	⊥ Technology	20.7%	17.2%
	⊥ Consumer Discretionary	8.3%	5.9%
	⊥ Energy	13.0%	8.0%
	...	...	...
Total		100%	100%

Source: Index Research and Design, FTSE Russell, June 2025.

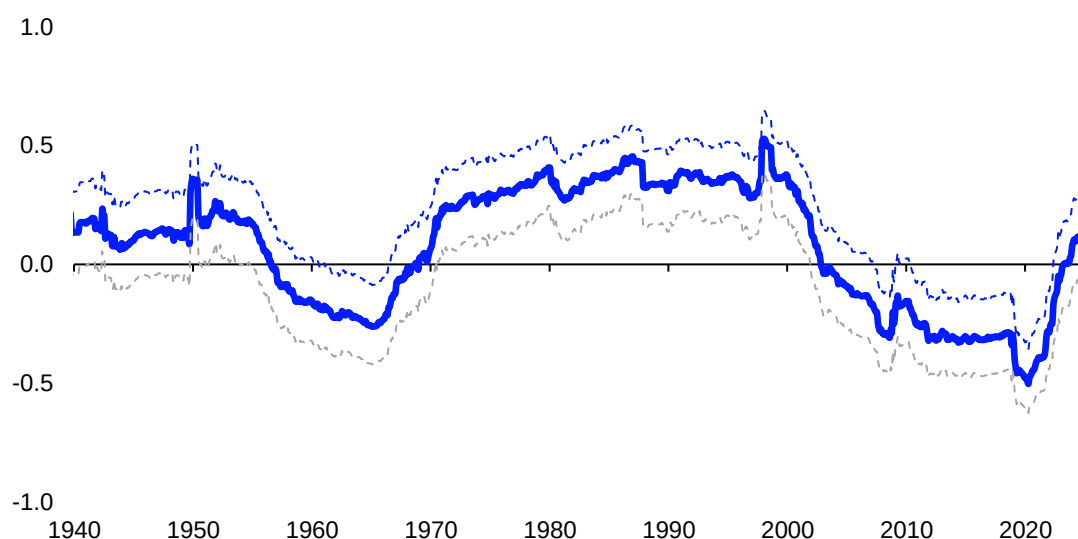
Stressing volatilities and correlations

With this rotated, enriched model in hand, it's now possible to explore *what-ifs*. What if volatilities change? What if correlations break down? In a world where asset relationships shift fast, risk models need to be flexible, too.

One powerful use case: changing the stock-bond correlation.

The stock-bond correlation has fluctuated wildly over the past 40 years—from strongly negative to significantly positive. What happens if it flips again? Can your portfolio handle that?

Figure 2: Historical stock-bond correlation



Source: Ibbotson, Roger G. and Harrington, James P., *Stocks, Bonds, Bills, and Inflation® (SBBi®): 2020 Summary Edition* (September 14, 2020). CFA Institute Research Foundation Publications, August 2020 and Index Research and Design, FTSE Russell, June 2025. Correlation between stocks and bonds is the rolling 120-month correlation including 5% confidence interval

To examine this, we set the stock and bond markets as the top-tier factors in the rotation¹. Everything else is orthogonalised away. This allowed us to manually override their correlation — for example at the historical extremes of +40% to -40%.

When we impose this new correlation structure, the model updates not just the stock-bond pair, but the entire factor covariance matrix. Risk attributed to Utilities vs. Tech, Value vs. Growth, etc. — all adjust dynamically². The model propagates the shock correctly, providing you with a sense of where fragility might lie in each scenario. This kind of stress-testing is no longer theoretical. It's precise, controlled, and anchored in your investment priorities.

¹ We use US Treasury bonds as a proxy to Bond factor.

² Changing correlation between Stock Market and Bonds alters the combined Stock Market + Bonds attribution to the tracking error, while leaving intact the attribution to the orthogonalised factors (⊥). The increase of the contribution from the former for negative Equity-Bond correlation is a consequence of underweighting Utilities in FTSE Russell All-World Developed Paris-Aligned Benchmark.

Table 3: Portfolio risk decomposition under +40% and -40% stock-bond correlation scenarios. FTSE Russell All-World Developed Paris-Aligned Benchmark as of Dec 2024

	Risk 40% Corr	Risk -40% Corr
Stock Market + Bonds	0.43%	0.67% ³
└ Other Macro Factors	0.47%	0.47%
└ Factors	0.89%	0.89%
└ Industries	0.49%	0.49%
└ Country	0.23%	0.23%
Stock Specific	0.87%	0.87%
Total	3.38%	3.62%

Source: Index Research and Design, FTSE Russell, June 2025.

Let’s talk about your rotation

This paper only scratches the surface. What we’ve shown is that risk models can—and should—be tailored to fit investment processes, not the other way around. Whether it’s aligning with your process, incorporating new macro risks, or stress-testing correlation scenarios, the tools exist to rotate your model into something sharper, smarter, and more reflective of your view of the world.

So, here’s our invitation: let’s talk. We’re happy to walk you through what a risk model rotation could look like for your strategy, and how small tweaks could lead to much more actionable risk reporting.

³ The increase in risk when stock-bond correlation is negative requires some explanation. The Paris-Aligned Benchmark has a positive beta to the stock market (as seen in the earlier risk attribution chart), but it also underweights bond-like sectors like Utilities, i.e. it has a negative beta to bonds. When stock-bond correlation is positive, the positive stock market exposure and the negative bond beta diversify. On the other hand, when stock-bond correlation is negative, the risk is compounded.

ABOUT FTSE RUSSELL

FTSE Russell is a leading global provider of index and benchmark solutions, spanning diverse asset classes and investment objectives. As a trusted investment partner we help investors make better-informed investment decisions, manage risk, and seize opportunities.

Market participants look to us for our expertise in developing and managing global index solutions across asset classes. Asset owners, asset managers, ETF providers and investment banks choose FTSE Russell solutions to benchmark their investment performance and create investment funds, ETFs, structured products, and index-based derivatives. Our clients use our solutions for asset allocation, investment strategy analysis and risk management, and value us for our robust governance process and operational integrity.

For over 40 years we have been at the forefront of driving change for the investor, always innovating to shape the next generation of benchmarks and investment solutions that open up new opportunities for the global investment community.

CONTACT US

To receive our research and insights email and Market Maps reports, directly to your inbox, subscribe [here](#).

To learn more, visit seq.com/ftse-russell; email info@ftserussell.com; or call your regional Client Service team office:

EMEA +44 (0) 20 7866 1810

Asia-Pacific

North America +1 877 503 6437

Hong Kong +852 2164 3333

Tokyo +81 3 6441 1430

Sydney +61 (0) 2 7228 5659

Disclaimer

© 2025 London Stock Exchange Group plc and its applicable group undertakings ("LSEG"). LSEG includes (1) FTSE International Limited ("FTSE"), (2) Frank Russell Company ("Russell"), (3) FTSE Global Debt Capital Markets Inc. "FTSE Canada", (4) FTSE Fixed Income LLC ("FTSE FI"), (5) FTSE (Beijing) Consulting Limited ("WOFE"). All rights reserved.

FTSE Russell® is a trading name of FTSE, Russell, FTSE Canada, FTSE FI, WOFE, and other LSEG entities providing LSEG Benchmark and Index services. "FTSE®", "Russell®", "FTSE Russell®", "FTSE4Good®", "ICB®", "Refinitiv", "Beyond Ratings®", "WMR™", "FR™" and all other trademarks and service marks used herein (whether registered or unregistered) are trademarks and/or service marks owned or licensed by the applicable member of LSEG or their respective licensors.

FTSE International Limited is authorised and regulated by the Financial Conduct Authority as a benchmark administrator.

All information is provided for information purposes only. All information and data contained in this publication is obtained by LSEG, from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical inaccuracy as well as other factors, however, such information and data is provided "as is" without warranty of any kind. No member of LSEG nor their respective directors, officers, employees, partners or licensors make any claim, prediction, warranty or representation whatsoever, expressly or impliedly, either as to the accuracy, timeliness, completeness, merchantability of any information or LSEG Products, or of results to be obtained from the use of LSEG products, including but not limited to indices, rates, data and analytics, or the fitness or suitability of the LSEG products for any particular purpose to which they might be put. The user of the information assumes the entire risk of any use it may make or permit to be made of the information.

No responsibility or liability can be accepted by any member of LSEG nor their respective directors, officers, employees, partners or licensors for (a) any loss or damage in whole or in part caused by, resulting from, or relating to any inaccuracy (negligent or otherwise) or other circumstance involved in procuring, collecting, compiling, interpreting, analysing, editing, transcribing, transmitting, communicating or delivering any such information or data or from use of this document or links to this document or (b) any direct, indirect, special, consequential or incidental damages whatsoever, even if any member of LSEG is advised in advance of the possibility of such damages, resulting from the use of, or inability to use, such information.

No member of LSEG nor their respective directors, officers, employees, partners or licensors provide investment advice and nothing in this document should be taken as constituting financial or investment advice. No member of LSEG nor their respective directors, officers, employees, partners or licensors make any representation regarding the advisability of investing in any asset or whether such investment creates any legal or compliance risks for the investor. A decision to invest in any such asset should not be made in reliance on any information herein. Indices and rates cannot be invested in directly. Inclusion of an asset in an index or rate is not a recommendation to buy, sell or hold that asset nor confirmation that any particular investor may lawfully buy, sell or hold the asset or an index or rate containing the asset. The general information contained in this publication should not be acted upon without obtaining specific legal, tax, and investment advice from a licensed professional.

Past performance is no guarantee of future results. Charts and graphs are provided for illustrative purposes only. Index and/or rate returns shown may not represent the results of the actual trading of investable assets. Certain returns shown may reflect back-tested performance. All performance presented prior to the index or rate inception date is back-tested performance. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect when the index or rate was officially launched. However, back-tested data may reflect the application of the index or rate methodology with the benefit of hindsight, and the historic calculations of an index or rate may change from month to month based on revisions to the underlying economic data used in the calculation of the index or rate.

This document may contain forward-looking assessments. These are based upon a number of assumptions concerning future conditions that ultimately may prove to be inaccurate. Such forward-looking assessments are subject to risks and uncertainties and may be affected by various factors that may cause actual results to differ materially. No member of LSEG nor their licensors assume any duty to and do not undertake to update forward-looking assessments.

No part of this information may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the applicable member of LSEG. Use and distribution of LSEG data requires a licence from LSEG and/or its licensors.

The information contained in this report should not be considered "research" as defined in recital 28 of the Commission Delegated Directive (EU) 2017/593 of 7 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council ("MiFID II") and is provided for no fee.