

Risky Business

Causeway Risk Lens Turns Five

“Sometimes you gotta say, ‘What the [heck], make your move.’” - Miles Dalby, Risky Business

Five years ago, Causeway made its move – offering online access to its proprietary risk model. The cloud application, called “Risk Lens,” is free for institutional investors and advisers. We asked Causeway’s co-founder, Sarah Ketterer, portfolio manager, Joe Gubler, and Risk Lens COO, Turner Swan, for their perspectives after 5 years online.

Joe, what problem does Risk Lens address?

JG: Initially, we had an internal problem. Causeway manages institutional client portfolios fusing fundamental and quantitative analysis, and one of our tenets is that “risk matters.” You cannot just look at performance, but risk and returns are inextricably linked and returns are ultimately the compensation for accepting uncertainty. We risk-manage our strategies carefully and constantly monitor portfolios with our proprietary risk model. The risk model, designed by our portfolio managers, is multi-factor and basically derives expected stock returns after assessing predicted risk exposures. It was – and is – a powerful tool for analyzing Causeway’s managed portfolios.

The problem, though, was that we wanted to use the same predicted risk analysis to compare our portfolios to other managers. This would help us better assess Causeway versus peers and help us manage portfolios and communicate portfolio positioning more effectively with clients. But the risk model did not have access to other managers’ portfolio holdings.

SHK: To fix this, we designed Risk Lens to apply elements of our risk model to other managers’ portfolios, as well as our own portfolios. We obtained the portfolio data by accessing the latest publicly available holdings of equity mutual funds, and back in 2013 we created the initial version of Risk Lens on manual Excel spreadsheets for internal use and to show clients.

As time went on, we realized that other institutional investors and fiduciaries had the same problem. They needed to know the key predicted risk exposures of their portfolios, and they needed to be able to compare these metrics to other managers.

JG: That’s when we realized we could share our risk model, through Risk Lens, directly with clients and other institutional investors. So in 2019 we “made our move” and provided independent online access to a broad institutional universe. Now Risk Lens is our proprietary analytics tool that provides key equity portfolio risks, predicted active return correlations (PARCs), ESG scores, and fund screening. It’s in the cloud and users can get access through their mobile devices or anywhere they

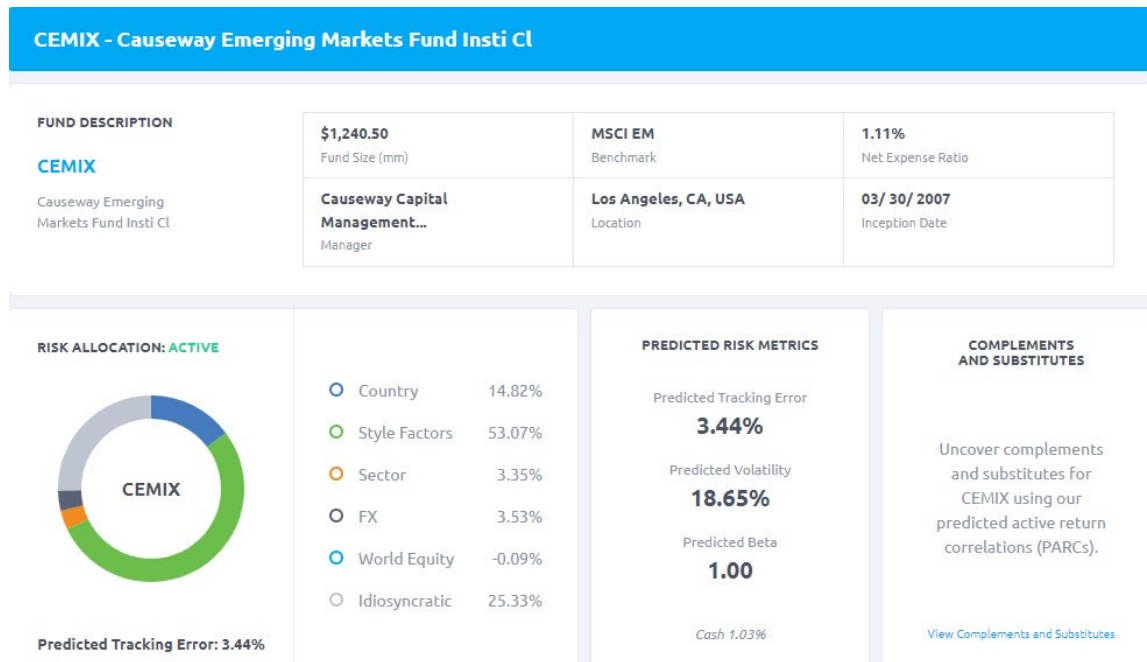
have an internet connection. We want our clients and the adviser community to have easy frictionless access via the cloud, so Risk Lens is free to use and requires no subscription agreement.

TS: For key risks, the tool analyzes the current holdings of a portfolio and shows predicted risk exposures and how much they contribute to tracking error. Among others, we show predicted volatility, predicted beta, predicted tracking error, and more. Risk Lens also provides style exposures, ESG scores, diversification ratios, active share, and geographic, sector, currency and market cap exposures. We like to emphasize, “know your portfolio.” Risk Lens helps a user look deep into a portfolio and when we look at risks, we are looking at recent holdings and generating predicted risks. This helps asset managers align predicted equity portfolio risk with their clients’ risk levels.

Joe, what does the Risk Lens output look like?

JG: Figure 1 is an example of a single fund summary, with a pie chart showing top risk allocations, and also predicted tracking error, volatility, and beta. At a given point in time, funds will have distinctive risk “footprints” and Figure 2 is an example of a style risk footprint. The graph is part of a comparative fund analysis report that shows active style exposures based on current portfolio holdings of four compared funds. At a glance, you can see the funds with more (blue) or less (gray) exposure to a style factor than the benchmark. To calculate style exposures, securities are “z-scored” on each of the eight style dimensions. The standardized z-scores range from +3 to -3, with a score of 0 being equal to the weighted average score across the universe, +3 being most representative of the style, and -3 being least representative of the style. Fund style exposures are the weighted average of the style scores of fund holdings. Active style exposures measure the difference between fund style exposures and benchmark style exposures.

FIGURE 1: SINGLE FUND SUMMARY



For illustrative purposes only. Source: Causeway Risk Lens.

FIGURE 2: “FOOTPRINT” OF ACTIVE STYLE EXPOSURES



For illustrative purposes only. CIISX plus top two complementary and substitute funds. Source: Causeway Risk Lens.

Turner, why does Causeway offer Risk Lens and who uses it?

TS: As Sarah noted, Risk Lens is first and foremost a tool for our clients, and we see Risk Lens as a way to further partner with clients. It offers users direct access to our proprietary risk model to analyze their own portfolios, as well as the thousands of equity funds in Risk Lens’ universe. In

addition to client service, Causeway will provide Risk Lens analysis to certain prospective clients so they can use Risk Lens themselves to evaluate and compare competitors in manager searches. We also believe Risk Lens showcases Causeway’s risk management prowess and generally helps promote Causeway’s brand to a broad institutional universe.

JG: As a portfolio manager, before going into a search presentation, I typically run Risk Lens comparing our Causeway strategy to competitors. If we don’t know our specific competitors, I’ll use Fund Screener in Risk Lens to screen the relevant benchmark universe and show the range of risk characteristics and top performers to help us understand how Causeway compares to peers. I’ll also often use our predicted active return correlation (PARC) tool to review the predicted correlations of a group of funds with Causeway funds, or to show a single fund’s top complementary (low correlated) and substitute (high correlated) funds. Using Risk Lens helps me have more sophisticated conversations with clients about the portfolio we manage and how it compares and contrasts with other equity funds.

TS: Our top users include analysts at some of the largest asset management firms in the world, and most of our users are also clients or have clients invested with Causeway.

“Many asset managers talk about wanting to be a partner and extension of staff, and we believe Risk Lens is actually a tangible offering in that spirit.” *Senior Investment Analyst, Large North American Asset Management Firm*

Usage is growing. Since 2021, the number of external users has increased 136% and the number of external Risk Lens reports generated has grown 631%. We are pleased so far with the attention Risk Lens has generated. We also survey top users from time to time and add features based on their input.

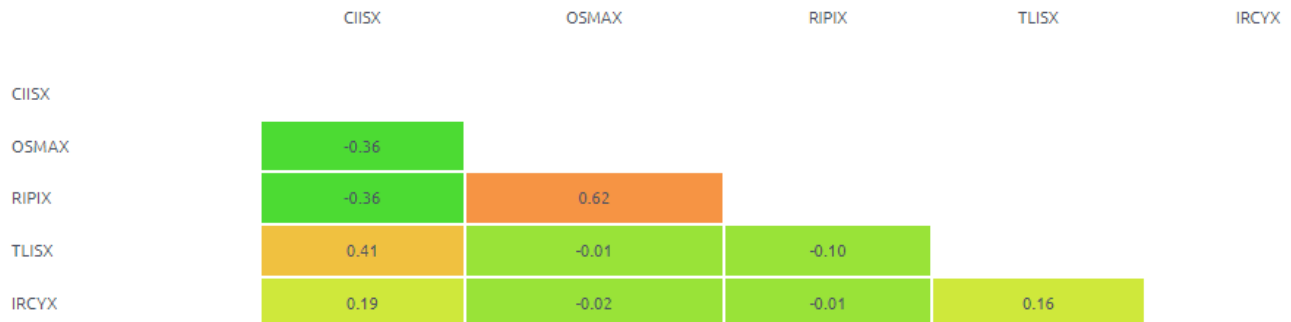
Joe, how can asset managers avoid investing in funds that are too similar?

JG: In 2013, we developed the calculation of predicted active return correlation, which we like to call “PARC” for short. PARC forecasts correlations between two or more funds, and is exclusively available in Risk Lens. This can help a manager avoid investing in funds that are too similar and help ensure diversification. It also shows if substitute funds – used to replace funds for tax loss harvesting, high fees, etc. – are predicted to be highly correlated, as shown in Figure 3.

We calculate funds’ historical returns to their style, country, sector and currency exposures to forecast correlations from –1 to +1, ranging from exact opposite correlation to no correlation to exact correlation. Users can use PARC to identify top complementary and substitute funds for asset allocation, as shown in Figure 4.

FIGURE 3: PREDICTED ACTIVE RETURN CORRELATION (PARC)

PREDICTED ACTIVE RETURN CORRELATION (PARC) - PROPRIETARY TO RISK LENS ⓘ



For illustrative purposes only. Source: Causeway Risk Lens.

FIGURE 4: COMPLEMENTS AND SUBSTITUTES

Complements and Substitutes

Benchmark: MSCI ACWI XUS SM CAP

Reference Date: Jan 31, 2024

CIISX - Causeway International Small Cap Fund- Institutional Class

Top Complementary Funds

Fund	Predicted Active Return Correlation
OSMAX Invesco International Small-Mid Comp	-0.36
RIPIX Royce International Premier Fund Insti	-0.36
GPIIX Grandeur Peak International Opportun	-0.34
BICIX Baillie Gifford International Smaller Cc	-0.32
HLSMX Harding Loevner Intl Small Companies	-0.31

Top Substitute Funds

Fund	Predicted Active Return Correlation
TLISX TIAA-CREF Quant International Small-C	0.41
IRCYX AB International Small Cap Portfolio -	0.19
DWUSX DFA World ex U.S. Targeted Value Por	0.13
CRNSX Catholic Responsible Investments Inte	0.11
FSMX Fidelity International Small Cap	0.07

For illustrative purposes only. Source: Causeway Risk Lens.

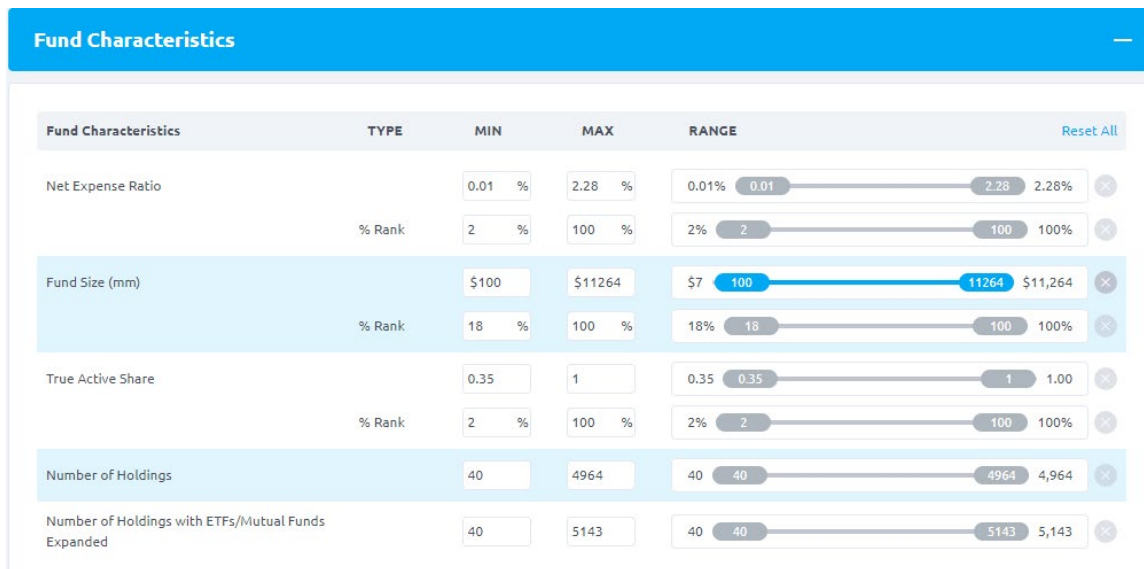
We believe that our risk model and PARC formula for predicted active return correlation can help asset managers and advisers build portfolios. Risk Lens looks forward – many other tools don’t, but instead focus on historical, not forecast risk measures. They don’t show predicted active return correlations for funds. Or they’re too expensive.

Turner, your newest feature is “Fund Screener.” How does that work?

TS: We are excited about Fund Screener. The tag line is “find the funds you need – with ease.” And we think that’s what it does. Users pick a benchmark, select screens for size, fees, performance, risk, and more, then click “Find Funds.” The tool sorts through approximately 3,400 equity funds and generates the results.

As illustrated in Figure 5, Fund Screener is intuitive and easy-to-use. Let’s say you want to find the top international small cap equity performers in the prior three years with a minimum level of net assets. First select the MSCI ACWI ex USA Small Cap Index as benchmark. There are 66 funds in this universe. Set minimum fund size to \$100 million (to screen out smaller funds) and input 75th percentile as the minimum rank in “Performance – 3 Year.” The universe narrows to 15 funds. Click “Find Funds” to obtain results, and sort the column labeled “Performance – 3 Year (Active)” from top-to-bottom. Below are the top 5.

FIGURE 5: SELECT CHARACTERISTICS



Performance	TYPE	MIN	MAX	RANGE	Reset All
Performance - YTD	Active	-1.2 %	2.9 %	-1.2% <input type="text" value="-1.2"/> <input type="text" value="2.9"/> 2.9%	<input type="button" value="x"/>
	% Rank	26 %	100 %	26% <input type="text" value="26"/> <input type="text" value="100"/> 100%	<input type="button" value="x"/>
Performance - 1 Year	Active	-6.9 %	17 %	-6.9% <input type="text" value="-6.9"/> <input type="text" value="17"/> 17.0%	<input type="button" value="x"/>
	% Rank	20 %	100 %	20% <input type="text" value="20"/> <input type="text" value="100"/> 100%	<input type="button" value="x"/>
Performance - 3 Year	Active	0.2 %	12.2 %	0.2% <input type="text" value="0.2"/> <input type="text" value="12.2"/> 12.2%	<input type="button" value="x"/>
	% Rank	75 %	100 %	5% <input type="text" value="75"/> <input type="text" value="100"/> 100%	<input type="button" value="x"/>
Performance - 5 Year	Active	-3.2 %	2.9 %	-3.2% <input type="text" value="-3.2"/> <input type="text" value="2.9"/> 2.9%	<input type="button" value="x"/>
	% Rank	16 %	98 %	16% <input type="text" value="16"/> <input type="text" value="98"/> 98%	<input type="button" value="x"/>
Performance - 7 Year	Active	-3.8 %	1.8 %	-3.8% <input type="text" value="-3.8"/> <input type="text" value="1.8"/> 1.8%	<input type="button" value="x"/>
	% Rank	4 %	93 %	4% <input type="text" value="4"/> <input type="text" value="93"/> 93%	<input type="button" value="x"/>
Performance - 10 Year	Active	-2.1 %	1.1 %	-2.1% <input type="text" value="-2.1"/> <input type="text" value="1.1"/> 1.1%	<input type="button" value="x"/>
	% Rank	9 %	91 %	9% <input type="text" value="9"/> <input type="text" value="91"/> 91%	<input type="button" value="x"/>
Batting Average - 3 Year		0.444	0.778	0.444 <input type="text" value="0.444"/> <input type="text" value="0.778"/> 0.778	<input type="button" value="x"/>
	% Rank	38 %	100 %	38% <input type="text" value="38"/> <input type="text" value="100"/> 100%	<input type="button" value="x"/>

ADD FUND	FUND	FUND SIZE (MM)	PERFORMANCE - 3 YEAR (ACTIVE) ↑	PERFORMANCE - 3 YEAR (% RANK)
<input type="button" value="+"/>	BISAX Brandes International Small Cap Fund- Class A	\$429	12.2%	100%
<input type="button" value="+"/>	CIISX Causeway International Small Cap Fund- Institutional Class	\$146	9.7%	97%
<input type="button" value="+"/>	DISVX DFA International Small Cap Value Portfolio	\$10,509	5.6%	94%
<input type="button" value="+"/>	AVDVX Avantis International Small Cap Value Fund Institutional Class	\$286	4.7%	92%
<input type="button" value="+"/>	OAKEX Oakmark International Small Cap Fund Investor Class	\$1,454	4.2%	91%

For illustrative purposes only. Using different criteria will yield different results. Source: Causeway Risk Lens.

Users can further refine the search as desired, adding screens for batting average, upside or downside capture, active style exposures, predicted risk metrics, and even active ESG scores.

FIGURE 6: APPLY STYLE SCREENS

Active Style Factor Exposures	TYPE	MIN	MAX	RANGE	Reset All
Value	Active Exp.	0.5	0.9	-0.25 0.90	<input type="button" value="x"/>
	% Rank	95 %	100 %	95% 100%	<input type="button" value="x"/>
Growth	Active Exp.	0.06	0.2	0.06 0.20	<input type="button" value="x"/>
	% Rank	36 %	68 %	36% 68%	<input type="button" value="x"/>
Leverage	Active Exp.	0.08	0.11	0.08 0.11	<input type="button" value="x"/>
	% Rank	91 %	97 %	91% 97%	<input type="button" value="x"/>
Momentum	Active Exp.	0.11	0.51	0.11 0.51	<input type="button" value="x"/>
	% Rank	80 %	100 %	80% 100%	<input type="button" value="x"/>
Cyclicality	Active Exp.	0.05	0.23	0.05 0.23	<input type="button" value="x"/>
	% Rank	61 %	95 %	61% 95%	<input type="button" value="x"/>
Size	Active Exp.	-0.28	0.37	-0.28 0.37	<input type="button" value="x"/>
	% Rank	14 %	91 %	14% 91%	<input type="button" value="x"/>
Volatility	Active Exp.	-0.03	0.1	-0.03 0.10	<input type="button" value="x"/>
	% Rank	50 %	92 %	41% 92%	<input type="button" value="x"/>

For illustrative purposes only. Source: Causeway Risk Lens.

Users can also download results into an Excel spreadsheet and incorporate the output into their own research reports or client communications.

Sarah, don’t other tools do this – what makes Risk Lens different?

SHK: Risk Lens looks forward; it focuses on the latest publicly available portfolio holdings and calculates predicted risk characteristics. So it’s “holdings based.” There are other tools out there, but many are “returns based” and therefore backward looking. These tools analyze how funds performed in the past and generate risk characteristics based on past holdings and returns. We are looking at current holdings and, from there, projecting what a fund’s risk metrics are predicted to be in the future.

Of course, there are some other sophisticated tools that can show predicted risk metrics like Risk Lens. But they tend to be much more complex to use and, frankly, expensive. Risk Lens does all this for free.

Are Causeway Funds Included?

TS: Yes, but when you use Risk Lens, you select your own funds for analysis. You can include Causeway Funds, or leave them out. And we don’t tweak Risk Lens programming to promote

Causeway Funds. Risk Lens is a search engine that pulls up funds and ETFs based on the criteria entered by the user. Risk Lens has a very broad universe – it covers approximately 3,400 U.S.-registered equity mutual funds and ETFs, approximately 9,500 share classes, and 37 benchmarks across all major geographies.

Sarah, what are Causeway Fiduciary ESG Scores?

SHK: Causeway Fiduciary ESG Scores are exclusively available in Risk Lens. We assess a company on environmental, social, and governance (E, S, and G) factors we believe are financially material for the company, considering its country and sector. Our research shows that firms with top quintile Causeway Fiduciary ESG Scores outperformed firms with bottom quintile scores and the global market over time. We call our scores “fiduciary” because they focus on material ESG characteristics and their potential to affect investment performance.

JG: How do we do it? Causeway’s quantitative model assesses a company’s performance on financially material ESG factors considering its country and company characteristics. Notice our emphasis on “materiality.” We’ve found that ESG performance on issues that are actually material to a company’s business also affect its investment performance.

To calculate an overall ESG score, we assign E, S, and G weights for a company. Currently, G is the highest weight and stays the same across sectors because we believe G applies equally to all companies. E is the next highest weight followed by S, and these weights are assigned based on their materiality in the company’s sector. A company’s overall score is the weighted average of its E, S, and G scores, and we aggregate the scores of companies in a fund to calculate the fund’s overall ESG scores. To perform all these calculations, our model uses a wide variety of data from government and non-government sources.

TS: And there are lots of ways to apply ESG. Take the MSCI EAFE benchmark in Risk Lens. That’s 336 funds and ETFs. Assume a user wants high trailing 3-year EAFE performers which also have high Governance or “G” scores. Using Fund Screener, you can set the 3-year performance and G screens at 75th percentile minimums. That narrows the universe to 15 funds. You can rank them highest-to-lowest by G and Figure 7 shows you the top 5 resulting funds.

FIGURE 7: 3-YEAR PERFORMANCE AND GOVERNANCE SCREENS

FUND SCREENER RESULTS: 15 FUNDS ADD / REMOVE COLUMNS

ADD FUND	FUND	CCM GOVERNANCE SCORE (% RANK) ↑	PERFORMANCE - 3 YEAR (% RANK)
+	SSIFX Sextant International Fund a series of Saturna Investment Trust	100%	84%
+	FICDX Fidelity Canada Fund	99%	99%
+	GSAKX Goldman Sachs International Equity Income Fund - Class A Shares	99%	94%
+	FCIUX MainStay PineStone International Equity Fund Class I	98%	78%
+	NUIIX Nuveen International Dividend Growth Fund Class I	97%	92%

For illustrative purposes only. Source: Causeway Risk Lens.

Joe, can you tell us more about the risk model?

JG: In our model, we start by identifying systematic sources of risk. The Capital Asset Pricing Model (CAPM) assumes that a portion of a stock’s expected return is due to its systematic relationship or “covariance” with the market’s return (the stock’s “beta”). Since CAPM was developed, research has uncovered additional systematic factors that influence expected returns beyond the market’s movements, and multi-factor risk models are better equipped to account for these many sources of risk. Factor models will differ in the choice of factors included as well as how loadings and returns are calculated. But at their core, all multi-factor risk models involve analyzing factor returns, a portfolio’s factor loadings (or risk exposures), and the returns attributable to these loadings.

Causeway’s proprietary risk model is multi-factor and includes categories for world equity, country, currency, sector, and style in addition to assessing idiosyncratic risks not captured by the common factor categories. All stocks are impacted by the broad ebbs and flows of the overall market. Portfolio returns are also influenced by their unique geographic exposures (both country and currency exposures). Sector membership also adds to variation in returns. Finally, there are style exposures. Size, value, growth, and cyclicity are just a few style attributes of stocks which influence returns. Our risk model derives expected stock returns from the sum of the products of all factor premia (the additional return investors gain by exposure to a particular risk factor) and factor exposures. As we discussed, we transported this capability to Risk Lens, basically to provide many of the elements of our risk model directly to clients, asset managers, and advisers.

Why is Risk Lens free?

TS: We currently provide Risk Lens at zero cost. We think it’s a critical tool for our clients and advisers who use Causeway Funds, and we give it away because we believe investors make better decisions with better information. We are confident that Causeway Funds will compare well using



Risk Lens or any other forward-looking analysis. We also believe Risk Lens provides Causeway significant value as a client service and business development tool.

To open a Risk Lens account, go to <https://analytics.causewaycap.com/> to request a login or email us at risklens@causewaycap.com.

Important Disclosures

About Risk Lens: Causeway manages global equities, fusing fundamental and quantitative analysis since 2001 and manages \$45.5 billion (at 12/31/23). In 2013, Causeway launched Risk Lens to bring the power of its risk model to clients, introducing the easy-to-use web application in 2019. Risk Lens covers approximately 3,400 U.S.-registered equity mutual funds and ETFs, approximately 9,500 share classes, and 37 benchmarks across all major geographies.

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management, custody, transaction, or other expenses. It is not possible to invest directly in an index. The MSCI ACWI ex USA Small Cap Index captures small cap representation across 22 of 23 developed markets (excluding the US) and 24 emerging markets. With 4,419 constituents, the index covers approximately 14% of the global equity opportunity set outside the US.

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