



Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 16

MEETING DATE: January 16, 2019

SUBJECT: Investment Manager Recommendation –
Domestic Equity

SUBMITTED FOR: ___ Consent X Deliberation and Action ___ Receive and File

RECOMMENDATION

(1) Invest approximately \$110 million with D.E. Shaw Investment Management in its Broad Market Core Alpha Extension 130/30 strategy. (2) Authorize Staff to determine the most effective method for transitioning the assets and execute any necessary documents or agreements to effectuate the transition.

PURPOSE

This agenda item supports the 2018-19 Strategic Management Plan to perform manager searches for the Domestic Equity asset class as needed.

SUMMARY

In June 2018, the Board approved an increased allocation to the Domestic Equity 130/30 Equity Extension strategy, up to 12% from the previous 5% previous target allocation, which is currently managed by J.P. Morgan Asset Management (JPM). This manager search was performed to fill the additional allocation to the Domestic Equity 130/30 Equity Extension strategy and to determine if the investment should be made with a single manager or a combination of multiple managers. The Domestic Equity Structure is presented below:

Domestic Equity Structure	Policy	Allocation	Manager
Russell 3000	100.00%		
Large Cap Passive (R1000)		54.00%	
Alliance Bernstein			54.00%
Large Cap Active (R1000)		36.00%	
Fundamental Concentrated - Eagle			12.00%
Equity Extension 130/30 - JPM and D.E. Shaw (Recommended)			12.00%
Systematic Multi-Factor - AQR			12.00%
Small Cap Value (R2000V)		5.00%	
DGHM			5.00%
Small Cap Growth (R2000G)		5.00%	
Weatherbie			5.00%

Following the Board’s approval of the increased allocation to the 130/30 Equity Extension strategy, Staff and Verus set out to identify appropriate candidates to fill the mandate. Staff and Verus identified a condensed list of potential candidates based on various criteria, such as sufficient levels of institutional infrastructure; a minimum amount of assets under management; organizational stability; differentiated investment philosophy and process; performance track record; and appropriate fees. After performing initial due diligence, which included reviewing manager materials and having preliminary discussions with managers, the list of manager candidates was narrowed to SCERS’ existing 130/30 manager, J.P. Morgan Asset Management and D.E. Shaw Investment Management. Following the selection of JPM and D.E. Shaw as final candidates for the mandate, Staff and Verus performed extensive due diligence on the firms. The review included interviewing the managers at their New York offices, as well as examining the investment team and strategy, portfolio construction and risk management, and performance history.

Based on the extensive analysis performed, Staff and Verus recommend adding D.E. Shaw as an investment manager for SCERS’ 130/30 Equity Extension strategy within the Domestic Equity asset class, and investing in the firm’s Broad Market Core Alpha Extension 130/30 commingled fund. Retaining D.E. Shaw for the additional allocation will complement the existing 130/30 Equity Extension mandate with JPM.

BACKGROUND

SCERS has invested in 130/30 Equity Extension strategies within the Domestic Equity portfolio for over 10 years, since 2008. The 130/30 Equity Extension strategy offers an equity manager a distinct opportunity to generate alpha compared to other long-only equity managers. The terminology “equity extension” is used because the strategy extends a manager’s ability to leverage their best ideas across both the long and short side of the market. The 130/30 strategy removes the long-only constraint and allows a manager to implement short positions to generate returns from stocks they dislike, in addition to taking long positions in stocks they view positively. Traditional long-only equity strategies are limited in their ability to benefit from

a negative view on a stock by simply not including it in the portfolio. Additionally, by selling short 30% of the portfolio, a manager has the option of extending their investment in the long side of the portfolio (i.e. increasing the investment in the best ideas up to 130%), while maintaining a net 100% market exposure and targeting a beta of 1.0, similar to a traditional long-only equity strategy. This is in contrast to hedge fund long-short equity strategies, which generally have less than 100% net exposure to the equity market and a significantly lower beta.

PORTFOLIO CONSIDERATIONS

As presented throughout the public equity restructuring performed in 2018, Staff and Verus have taken steps to simplify SCERS’ Domestic and International Equity portfolios, including reducing the number of managers and eliminating overlap and redundancies where possible, while also maintaining appropriate diversification. Consolidating the manager lineup provided the dual benefit of allowing SCERS to maintain exposure to its highest rated managers and to reduce management fees by consolidating mandates within certain sub-asset classes. However, based on the increased 130/30 Equity Extension mandate size, from 5% to 12% of the Domestic Equity portfolio, Staff and Verus felt it was appropriate to perform a manager search, and potentially add a new manager, prior to making a recommendation to fill the mandate. The manager search process allowed SCERS to evaluate potential new managers alongside the existing 130/30 manager, JPM, and recommend the highest rated manager that complimented SCERS’ existing Domestic Equity portfolio.

D.E. Shaw has generated an impressive performance history, outperforming the Russell 1000 index across all periods measured. In addition, Staff and Verus examined the correlation of excess returns generated by D.E. Shaw and SCERS’ existing large-cap Domestic Equity active managers. As shown in the correlation matrix¹ below, the D.E. Shaw 130/30 strategy has a low correlation of excess returns with all of SCERS’ existing large cap active managers, including JPM.

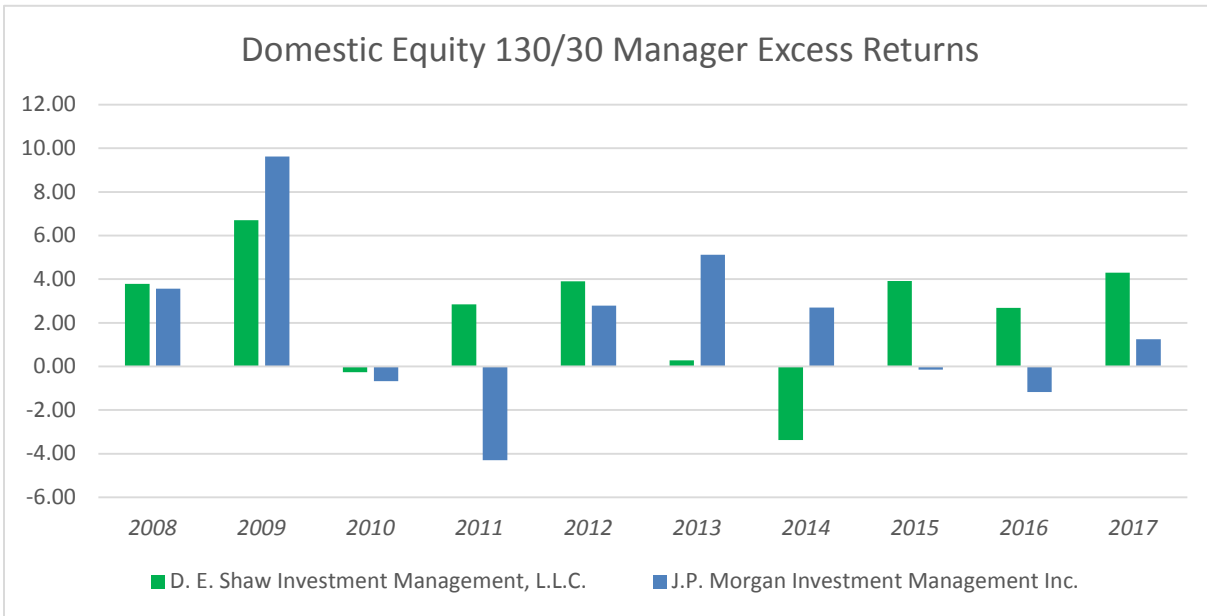
Correlation Matrix: Excess Returns - 7 Years (06/2018) using Russell 1000				
Firm Name	AQR Capital Management LLC	D. E. Shaw Investment Management, L.L.C.	Eagle Capital Management, LLC	J.P. Morgan Investment Management Inc.
	US Enhanced Equity	D. E. Shaw Broad Market Core Alpha Extension Strategy	Eagle Equity	JPM Large Cap Core 130/30
AQR Capital Management LLC	1.00	0.06	0.05	-0.05
D. E. Shaw Investment Management, L.L.C.	0.06	1.00	-0.13	0.16
Eagle Capital Management, LLC	0.05	-0.13	1.00	0.10
J.P. Morgan Investment Management Inc.	-0.05	0.16	0.10	1.00

Source: Verus, as of June 30, 2018

Looking further into the excess returns generated by the two 130/30 manager finalists, the following chart details the annual excess returns, above the Russell 1000 index, for the ten years ending 2017. While both managers generated notable excess returns over the 10-year period, on an annualized basis, the following chart details the low correlation of excess returns

¹ Correlation Matrix: A table showing correlation coefficients between variables. The correlation coefficients measure how closely two variables (excess manager returns) move in relation to one another. Coefficients have a range of +1 and -1, with a correlation of 0 representing no relationship between the variables.

for the two managers. This chart highlights the performance differences resulting from the differentiated investment strategy used by each manager to generate performance, with the D.E. Shaw strategy providing diversification and a complimentary source of returns to the 130/30 Equity Extension allocation for SCERS.



Source: SCERS, Verus

With the potential addition of D.E. Shaw to SCERS’ Domestic Equity manager line-up, the actively managed segment of the large-cap Domestic Equity portfolio would be split evenly between fundamental managers (Eagle, JPM) and quantitative, systematic managers (AQR, D.E. Shaw). While the shift to adding quantitative, systematic managers to the Domestic Equity portfolio is a notable change, with the potential addition of D.E. Shaw, these strategies would still only represent approximately 18% of the overall Domestic Equity portfolio.

MANAGEMENT FEE

D.E. Shaw offers either a flat base fee or performance based fee schedule. The flat base fee is 78 basis points annually. The performance based fee schedule is a 38 basis point annual fee with 20% performance fee for returns above the benchmark, net of the base fee. Therefore, the breakeven point for the performance based fee is outperformance of +2.38% over the benchmark Russell 1000 index. Additionally, the performance based fee includes a “Relative Loss Carryforward” provision, which limits the performance fee if there were prior periods of underperformance.

Staff and Verus recommend the performance based fee schedule for the potential investment with D.E. Shaw. The performance based fee does not include a cap on overall management fees; however, this is mitigated by the fact that D.E. Shaw maintains a tracking error target of 300 basis points. Tracking error measures the standard deviation of performance differences

versus the benchmark, with a lower tracking error target representing less expected variation in performance compared to the benchmark. Performance based management fees help align the interests of the investor and manager, with both parties benefiting from outperformance above the benchmark. The lower base fee associated with the performance based fee schedule also helps to minimize the cost during periods of manager underperformance.

ACCOUNT STRUCTURE AND LEGAL REVIEW

Investments into the D.E. Shaw Broad Market Core Alpha Extension strategy can be made utilizing either a separate account or commingled fund structure. While SCERS generally prefers a separate account for Domestic Equity mandates, the commingled fund structure is more efficient and preferable for 130/30 investment strategies because they short securities, which is more operationally complex. Additionally, the management fees for the commingled fund are the same as for a separate account, and the minimum investment size for separate accounts with D.E. Shaw is \$150 million.

Across its Active Equity products, D.E. Shaw offers investment products with different benchmarks and tracking error targets. For SCERS' portfolio, Staff recommends investing in the D.E. Shaw fund benchmarked to the Russell 1000 with a 300 basis point tracking error target. The 300 basis point tracking error strategy offers the best alpha opportunity with a relatively moderate amount of expected risk.

SCERS has engaged outside legal counsel to begin reviewing fund documents. By entering into the commingled fund, versus a separate account with SCERS' standard investment management agreement, SCERS will also negotiate a separate amendment to the subscription agreement with D.E. Shaw to include provisions specific to SCERS. SCERS' outside counsel has also begun the process of negotiating the amendment, to ensure there are no major issues of disagreement, prior to making the recommendation. Any finalization of an investment with D.E. Shaw would be contingent on the successful completion of amendment.

IMPLEMENTATION AND TRANSITION

As presented at the June 2018 Board meeting, SCERS waited to rebalance the passive large-cap allocation, managed by Alliance Bernstein, until the selection of the 130/30 manager. At the time, the targeted rebalance amount from the passive large cap portfolio was approximately \$120 million, which aligned with the increased allocation size for the 130/30 mandate. Waiting to rebalance the passive allocation allowed SCERS' Domestic Equity portfolio to maintain its target allocation to equities until the 130/30 manager was selected.

Based on adjusted portfolio market values, as of December 31, 2018, the target allocation to the new 130/30 manager would be approximately \$110 million. The passive allocation is currently at 60% of the Domestic Equity portfolio, above the target allocation of 54%, with the targeted reduction also at approximately \$110 million. The transition plan would be to rebalance the passive large-cap allocation to target and use the proceeds to fund the new 130/30 mandate.

Given the securities included in the large-cap passive portfolio are generally liquid and easily traded, there are several potential options for transitioning assets including:

- Redeeming the full amount of the rebalance amount from Alliance Bernstein in cash and using the proceeds to fund the investment.
- Transferring securities in-kind from Alliance Bernstein to D.E. Shaw, thus reducing the commission, trading, and market impact costs associated with buying and selling positions. The securities transferred would be based on the crossover in holdings between the passive and D.E. Shaw portfolios, with the balance funded in cash.
- Utilizing a transition manager to coordinate the transfer of securities from the passive portfolio and purchase the requisite securities needed to complete the investment with D.E. Shaw.

SCERS will coordinate with both managers to determine the most efficient and effective method to complete the transition. SCERS will also explore the option of retaining an outside consultant to perform pre-trade and post-trade analysis. This approach has been utilized in prior equity transitions and is useful in understanding the cost and impact of the transition to SCERS' portfolio, evaluating the effectiveness of transition managers, and estimating the cost saving from transitioning securities in-kind.

CONCLUSION

Staff has a high degree of confidence that an investment with D.E. Shaw, in its Broad Market Core Alpha Extension 130/30 strategy, will be a strong addition to SCERS' Domestic Equity portfolio. D.E. Shaw has generated strong returns, outperforming the benchmark with similar levels of portfolio volatility, resulting in excellent Sharpe and Information Ratios. Additionally, the excess returns generated by D.E. Shaw have a low correlation with excess returns generated by other active equity managers, which should provide diversification and be complimentary to SCERS existing Domestic Equity portfolio.

The Board will have the opportunity to hear from D.E. Shaw directly at the January Board meeting and ask any questions, prior to considering the recommendation.

D.E. Shaw offers monthly entrance into its commingled funds. Pending Board approval, Staff would target an entrance into the D.E. Shaw fund on February 1, 2019. Staff also seeks Board approval to determine the most effective method for transitioning assets and execute any necessary documents or agreements to effectuate the transition.

ATTACHMENTS

- Staff and Verus presentation
- Verus recommendation memo
- Verus manager evaluation
- D.E. Shaw presentation

Prepared by:

/S/

Brian Miller
Investment Officer

/S/

Steve Davis
Chief Investment Officer

Reviewed by:

/S/

Eric Stern
Chief Executive Officer

Memorandum

To: Sacramento County Employees' Retirement System Board (SCERS)
From: John Nicolini, Barry Dennis, Margaret Jadallah (Verus)
Date: January 16th, 2019
RE: **U.S. Large Cap 130/30 Search**

As part of the public equity structure implementation, the Board approved a new allocation in U.S. large cap equity which involved redeeming from a growth and value manager and moving to a blended portfolio of large cap core strategies. SCERS already had two large cap core managers in Eagle Capital and JPMorgan Large Cap Core 130/30. Staff and Verus recommended adding a third factor-based strategy to round out the large cap allocation. In June, the Board approved adding AQR US Factor Enhanced to fill the factor-based strategy mandate. Within the revised domestic equity structure, the 130/30 allocation approximately doubled in size, from 5% to 12%, with the passive Alliance Bernstein mandate serving as the source of capital for the increased allocation. With the addition of AQR and the rebalancing of capital, the U.S. domestic equity portfolio would look as follows based on current allocations, if the entire 130/30 mandate was allocated to the JPMorgan strategy:

	Current Allocation %	Target Allocation %
U.S. Large Cap Equity		
Alliance Bernstein (Russell 1000)	60.0%	54.0%
Eagle Capital	12.0%	12.0%
AQR US Factor Enhanced	12.0%	12.0%
JPMorgan 130/30	6.0%	12.0%
U.S. Small Cap Equity		
Dalton Greiner – Small Cap Value	5.0%	5.0%
Weatherbie – Small Cap Growth	5.0%	5.0%

Both Verus and Staff believe the concept of a 130/30 strategy is attractive and over a longer history, JPMorgan has demonstrated they can deliver strong alpha with the added flexibility to short stocks. That said, more recent performance has not achieved the same level of outperformance and the retirement of one of the founding portfolio managers gave us some concern. Verus and Staff decided to conduct a review of the U.S. large cap 130/30 universe to determine which manager the additional allocation to the 130/30 segment should be allocated to.

Verus began by screening the eVestment database and reviewing data and meeting notes in the Firm's internal database. The universe of domestic large cap active extension products (i.e. 130/30, 120/20, etc.) is quite small and those with at least \$500 million narrows the universe to less than a handful of products. Two of the strategies that were viable candidates for SCERS included JPMorgan's 130/30 strategy and D.E. Shaw Broad Market Alpha. D.E. Shaw is a firm that we engaged with during the large cap factor-focused search and though we found them a compelling manager, it was not a great fit under the parameters of the search. D.E. Shaw is better known in the market place as an exceptional multi-strategy hedge fund manager, but they have extended some of those same trading/investing tools for use in long-only and long-biased equity products.

SCERS Staff and Verus conducted calls with the D.E. Shaw team and had an onsite meeting with their team in New York this past fall to gain more comfort around the unorthodox approach to investing. We knew the track records across the Firm's products were attractive but spending time with the organization validated their claims and reputation for being on the cutting-edge of quantitative investing. On its own, D.E. Shaw is a compelling investment option for SCERS but as a compliment to the strategies in the large cap portfolio, they stand out. The trade ideas that the quantitative model exploits are completely unique from what other managers within the SCERS large cap portfolio use and the duration of their trades are often measured in days, weeks and sometimes months. Eagle Capital, by contrast, measures their trade ideas in years as they wait for the market to recognize a stocks fair value. Additionally, D.E. Shaw will control for and actively remove common factor bias's like value, momentum and size which AQR seeks exposure to.

One concern we would highlight is a recent suit filed by a former employee against D.E. Shaw alleging defamation. The suit stems from an alleged complaint against the former employee which resulted in his termination. We don't know the merits of the lawsuit/arbitration claim, but some concerning stories have emerged from the press regarding the culture at D.E. Shaw. For legal reasons, D.E. Shaw has been reluctant to say much on the matter beyond a boilerplate legal statement that they were in the right to terminate the employee. The back and forth in the press between D.E. Shaw and the employee appears to have stopped in the last 4-5 months and we aren't aware of any new stories that could emerge creating headline risk for the Firm. It should be noted that the terminated employee was not involved in this strategy nor the active equity division with D.E. Shaw.

RECOMMENDATION

Verus and Staff believe that adding D.E. Shaw's 130/30 product to the large cap portfolio will provide a unique set of alpha drivers that are distinctly different from the strategies currently in the SCERS portfolio. Further, D.E. Shaw has shown that they can consistently deliver excess returns in a segment of the equity market which has proved elusive for most active managers to outperform. We recognize that adding a new manager to the large cap portfolio may seem counter to our goal of reducing the number of managers within the SCERS public equity book, however, given the size of the 130/30 mandate and the complimentary nature of JPMorgan's

fundamental strategy versus the pure quantitative D.E. Shaw strategy it made sense to pair the strategies. If D.E. Shaw is approved, the SCERS domestic equity portfolio would be split as follows:

	Current Allocation %	New Target Allocation %
U.S Large Cap Equity		
Alliance Bernstein (Russell 1000)	60.0%	54.0%
Eagle Capital	12.0%	12.0%
AQR US Factor Enhanced	12.0%	12.0%
JPMorgan 130/30	6.0%	6.0%
D.E. Shaw Broad Core Alpha		6.0%
U.S. Small Cap Equity		
Dalton Greiner – Small Cap Value	5.0%	5.0%
Weatherbie – Small Cap Growth	5.0%	5.0%

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Manager Evaluation

D. E. Shaw Broad Market Core Alpha Extension Strategy

LAST UPDATED: DECEMBER 2018

STRATEGY BASICS

Asset Class:	Domestic Equity
Investment Style:	130/30
Firm Inception:	1988
Firm Assets:	\$50.1 Billion
Strategy Inception:	June 2007
Strategy Assets:	\$4.4 Billion
Fund Fee:	0.78% flat fee OR 0.38% + 20% performance fee over the Russell 1000

The D. E. Shaw group's investment capital as of December 2018 included approximately US \$19.8 billion managed by D. E. Shaw Investment Management, L.L.C. ("DESIM"). DESIM applies the D. E. Shaw group's quantitative models and computational techniques, based on the D. E. Shaw group's more than 25 years of experience in managing alternative investment strategies, to construct benchmark-relative long-only and "130/30" U.S. and global equity ("Active Equity") strategies for public and private pension plans, endowments, foundations, and private wealth management firms.

The D. E. Shaw group was formed in 1988 and began managing investment vehicles deploying certain of its alternative investment strategies in 1989. In 2000, D. E. Shaw established its business focused on long-biased strategies in major, liquid asset classes with the launch of a portfolio deploying the first of its long-only Structured Equity strategies. In 2005, DESIM was formed, registered with the U.S. Securities and Exchange Commission (the "SEC") as an investment adviser, and commenced operations to assume responsibility for operating the active equity business. In 2006, DESIM began deploying the D. E. Shaw Alpha Extension strategies, a suite of "130/30-type" strategies in which the portfolio under management is allowed to hold short positions. DESIM began making available long-only and 130/30 active equity strategies benchmarked to global equity indexes in 2008 and began managing its first global active equity portfolio, benchmarked to the MSCI World Index, in 2009. DESIM began managing a portfolio benchmarked to the MSCI All Country World Index, or MSCI ACWI, in 2013.

Firm Background and History

The D. E. Shaw group is a global investment and technology development firm with more than 1,200 employees; approximately US \$50.1 billion in investment capital as of December 1, 2018; and offices in North America, Europe, and Asia. Since its organization in 1988, the D. E. Shaw group has earned an international reputation for successful investing based on innovation, careful risk management, and the quality and depth of its staff. The D. E. Shaw group has a significant presence in the world's capital markets, investing in a wide range of companies and financial instruments in both developed and developing economies.

The D. E. Shaw group's activities include alternative investment strategies focused on the delivery of absolute returns, with low targeted correlation to traditional assets like equities.

D. E. Shaw & Co., L.P. ("DESCO LP") is the managing member of D. E. Shaw Investment Management, L.L.C. ("DESIM") and owns 100% of DESIM. The general partner of DESCO LP is D. E. Shaw & Co., Inc. David E. Shaw is Chairman, President, and the sole stockholder of D. E. Shaw & Co., Inc.

Strategy Background

The D. E. Shaw Broad Market Core Alpha Extension Strategy seeks to generate risk-controlled outperformance relative to the Russell 1000[®] Index by means of a highly systematic, predominantly “bottom-up” approach to investing in equity securities. The engine behind the strategy is a suite of proprietary quantitative models designed to exploit multiple independent sources of market inefficiency. The exact number of alpha signals that the model will look to trade on is proprietary, but they include signals that may have a trade duration measured in days, weeks and in some cases, months. Given the need for limited capacity, the active equity strategies will not trade intra-day signals which the D.E. Shaw hedge fund can use. Further, the models used on the DESIM side of the business are sub-set of the models used on the hedge fund side. A “Chinese wall” has been set-up so that the two businesses do not know the trading activity between the strategies.

The BMCAE Strategy is benchmarked to the Russell 1000[®] Index, managed with the long-term objective of a realized tracking error from that index of 300 basis points, and typically involves short positions ranging from 25% to 35%* of each portfolio’s net asset value. There can be no assurance that DESIM’s expectations will be realized or its objectives met.

Key Investment Professionals

The Structured Equity team harnesses the resources of DESIM and the broader D.E. Shaw organization. Quantitative resources include 1) 75 investment professionals with Ph.Ds., principally with backgrounds in math, physics and computer science, 2) a team of 60 quantitatively oriented research analysts, financial analysts and software developers, and 3) robust, proprietary technological tools for modeling and trading utilizing “cluster” servers and serviced by hundreds of IT professionals.

Philip Kearns, Ph.D. is the CIO and named PM.

Process

DESIM believes:

- financial markets are in constant flux and generally, but not always, efficient;
- Human insight can identify potential sources of market inefficiency, and rigorous quantitative analysis can validate them;
- Advanced portfolio construction and risk management techniques can help profitably capture those inefficiencies for investors.

DESIM employs sophisticated proprietary software that serves as an optimizer to construct and modify portfolios deploying its Active Equity strategies. The optimizer seeks to maximize portfolio outperformance, net of various forms of transaction costs, relative to a given equity benchmark while attempting to maintain a client-specified tracking error to such a benchmark.

While more traditional active equity approaches might independently consider the merit of each distinct investment decision, DESIM’s Structured Equity investment process seeks to build an aggregate portfolio of individual stock positions that maximizes the portfolio’s expected information ratio. The optimization process associated with DESIM’s Active Equity strategies is highly dynamic—the optimizer cycles throughout the trading day to take into account newly available market information—and provides advanced support for automated planning across multiple time horizons. Factors considered by the optimizer when constructing such a portfolio include forecasts of expected return, risk, and transaction costs associated with a universe of a few thousand stocks.

Risk Management

Certain features of the D. E. Shaw group’s proprietary risk management software enable DESIM to monitor risk in an automated fashion and on a virtually real-time basis. DESIM believes that monitoring and managing the risk of a portfolio that holds hundreds of positions and tracks a beta of 1.0 to a benchmark index throughout the trading day requires sophisticated quantitative tools given the complexity and speed with which such a portfolio can be impacted by new market data. Automated risk management software attempts to measure and manage deviations from the specified benchmark, at the individual stock level and across the entirety of the portfolio, and in both absolute and risk-weighted terms. DESIM incorporates a number of proprietary models of various forms of risk into this automated risk management platform. DESIM generally does not rely on third-party risk

management software, as it believes that a strong emphasis on proprietary systems enhances its ability to adapt to rapidly changing market conditions and facilitates a better understanding of the relationship between return forecast models and risk models in the portfolio management process.

While a significant amount of the D. E. Shaw group's research resources is devoted to the deployment and refinement of this risk management technology, a second, more human-oriented dimension of risk monitoring is also important and applies in various respects to all of the investment strategies managed by the D. E. Shaw group. Examples of human involvement in risk analysis include the infrequent overriding of suggested trade orders made by the optimization software in light of recent market events of which the software may not be "aware" (for example, a major event affecting a relatively large company), the rare introduction of broader risk-reducing constraints in response to highly unusual market conditions (for example, after the Japanese earthquake in 2011), and the updating of dollar position limits designed to constrain concentrations in particular issuers or industry groups. Human involvement in the risk monitoring process is generally intended to limit, rather than increase, exposure to certain risk factors that the D. E. Shaw group's optimization software might otherwise be willing to assume.

Performance

D.E. Shaw has historically been able to provide attractive risk adjusted returns. The strategy has beat the benchmark for the 1, 3, 5, and 10-year trailing periods ending September 30, 2018. The tracking error over the long term is in the 2.5-3% range. Additional performance information is provided in an accompanying document.

Recommendation

Verus has reviewed D.E. Shaw's process and believes it is a suitable candidate for SCERS' 130/30 mandate.

Domestic Equity 130/30 Equity Extension Manager Recommendation

January 16, 2019



SCERS

SACRAMENTO COUNTY
EMPLOYEES' RETIREMENT SYSTEM

Verus⁷⁷⁷

Overview

- ❖ Review of SCERS Domestic Equity portfolio
- ❖ 130/30 Equity Extension Overview
 - ❖ Role within Domestic Equity portfolio
- ❖ Manager Search Process
- ❖ Recommendation Summary



SCERS Domestic Equity Portfolio

❖ SCERS Domestic Equity portfolio: 21.0% target allocation

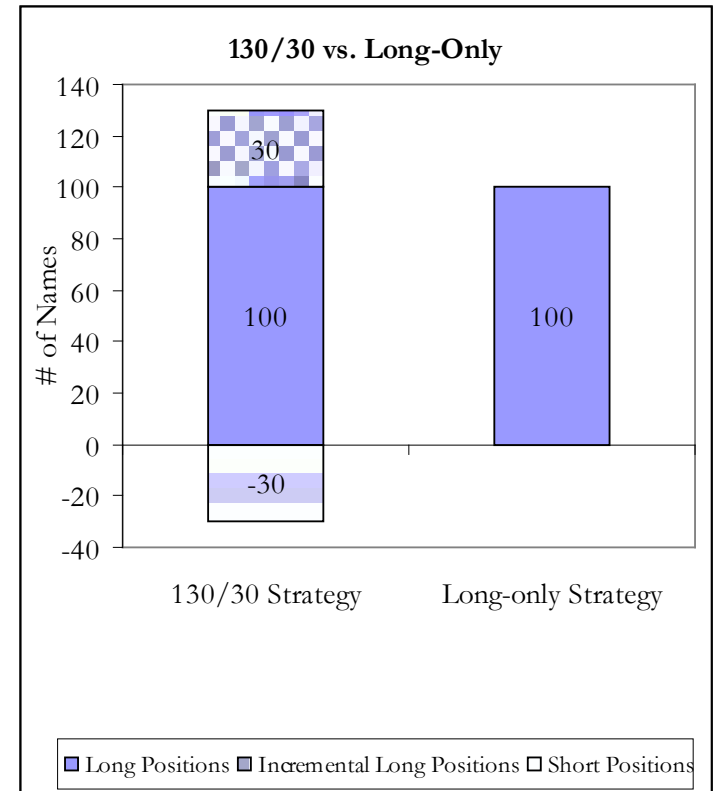
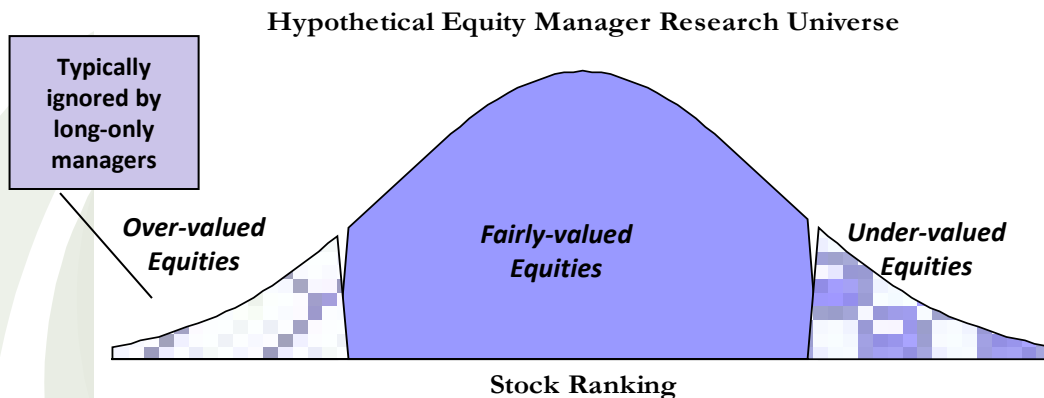
Domestic Equity Structure	Policy	Allocation	Manager
Russell 3000	100.00%		
Large Cap Passive (R1000)		54.00%	
Alliance Bernstein			54.00%
Large Cap Active (R1000)		36.00%	
Fundamental Concentrated - Eagle			12.00%
Equity Extension 130/30 - JPM and D.E. Shaw (Recommended)			12.00%
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Small Cap Value (R2000V)		5.00%	
DGHM			5.00%
Small Cap Growth (R2000G)		5.00%	
Weatherbie			5.00%

- ❖ 130/30 Equity Extension allocation was increased to 12% as part of Domestic Equity restructuring in 2018
- ❖ Manager search was performed to fill the increased allocation
- ❖ Allocation to Large Cap Passive portfolio has been overweight the target allocation (60% versus 54%) during the search process



130/30 Equity Extension

- A 130/30 strategy removes the long-only constraint, allowing the manager to implement short positions, while increasing the long equities in the same proportion to maintain a net exposure of 100%
- Employing a 130/30 strategy increases the breadth of the investable universe, increasing the potential for alpha



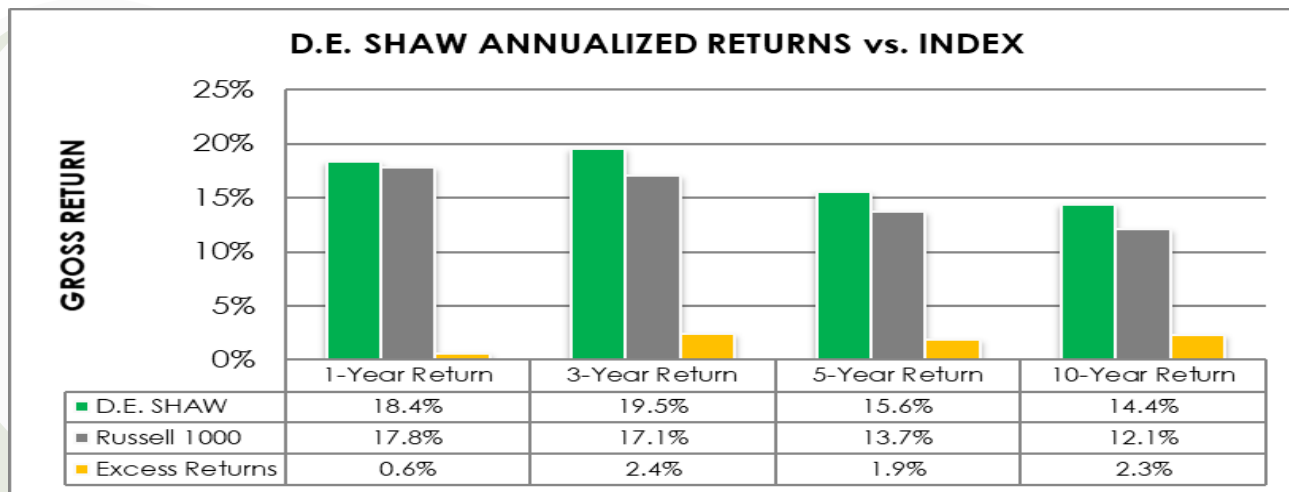
Manager Search Process

- ❖ Screen universe of managers that meet investment criteria
 - ❖ Minimum AUM, performance history, organizational stability, investment style and process, appropriate fees
- ❖ Begin due diligence process to narrow list of potential candidates down to select “finalists”
- ❖ Perform extensive due diligence on finalist candidates, which included in-person interviews at manager’s offices
- ❖ Continued manager review post-interviews, including Staff reporting and legal review
- ❖ Finalize recommendation



D.E. Shaw Summary

- ❖ Quantitative based investment management firm, utilizing a systematic approach to build active equity portfolios
- ❖ Leverages the resources of the broader D.E. Shaw Group, including a centralized equity research and technology platform, to build proprietary quantitative models
- ❖ Unique investment philosophy which seeks to exploit market inefficiencies and identify persistent, stock specific, idiosyncratic sources of alpha
- ❖ Strong performance history, with excess returns that have a low correlation with SCERS existing large cap active equity managers



Recommendation Summary

- ❖ Staff and Verus recommend adding D.E. Shaw as a manager within SCERS' Domestic Equity portfolio and investing approximately \$110 million in its Broad Market Core Alpha Extension 130/30 strategy
- ❖ Redeem from SCERS' Large Cap Passive portfolio to fund the 130/30 investment
- ❖ Authorize Staff to develop an implementation plan to determine the most effective method for transitioning assets, and execute any necessary documents or agreements to complete the transition



CONFIDENTIAL

D. E. SHAW ACTIVE EQUITYSM

D. E. Shaw Investment Management, L.L.C.

PREPARED FOR: **Sacramento County Employees' Retirement System**

PRESENTATION DATE: **January 16, 2019**

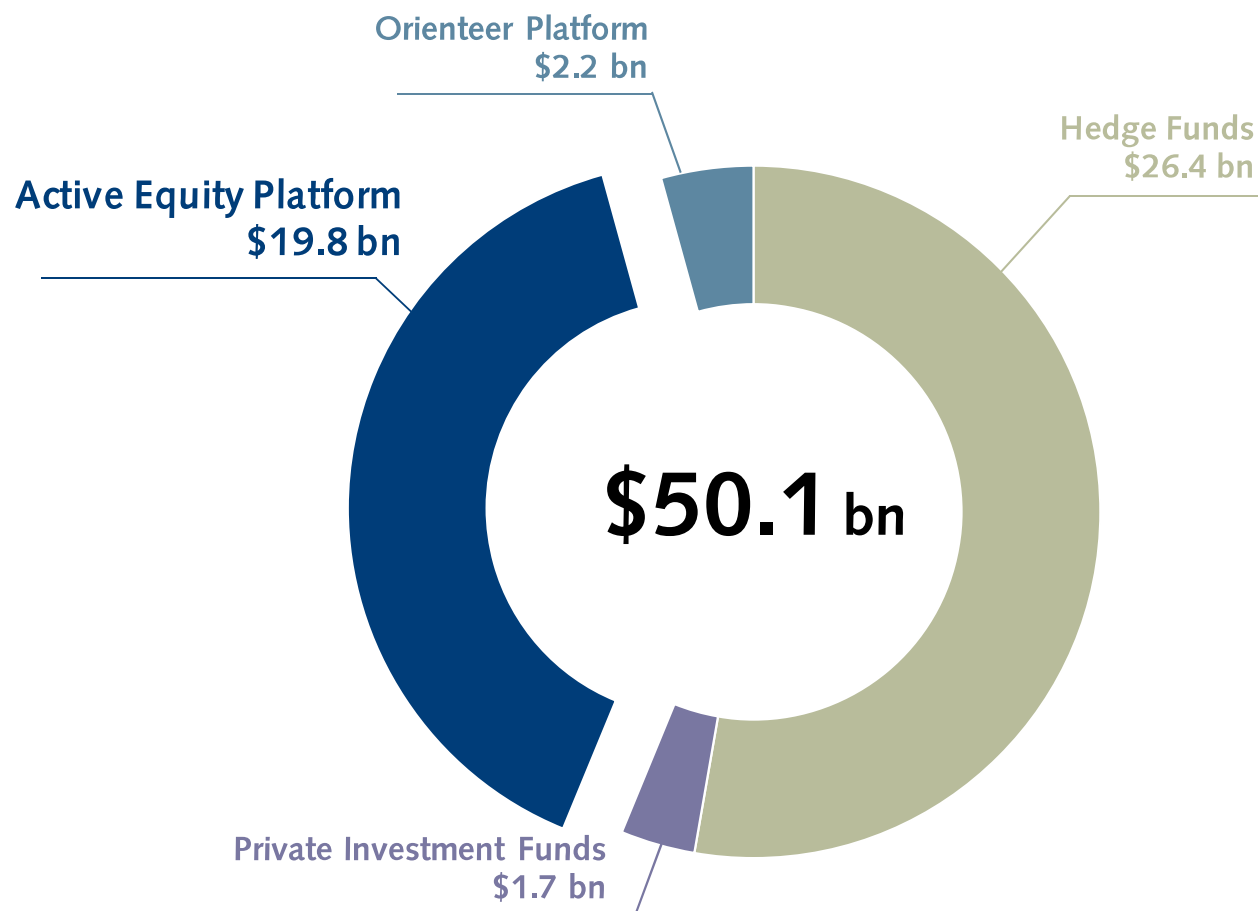
PRESENTED BY: **Letitia Yang and Jordan Drachman**

The logo for DE Shaw & Co, featuring the company name in a serif font with a horizontal line above the 'E' and 'S'.

DE Shaw & Co

The D. E. Shaw Group

A global, multi-disciplinary investment firm founded in 1988, headquartered in New York, and built on the expertise of more than 1,200 employees worldwide.



Data presented is as of December 1, 2018.

Distinguishing Features

Exceptional Personnel

- 280 investment professionals, including 75 Ph.D.s
- Active recruiting from atypical talent pools

Strong Firm Culture

- Analytical rigor
- Collegial atmosphere that promotes collaboration
- Adherence to highest ethical standards

Breadth

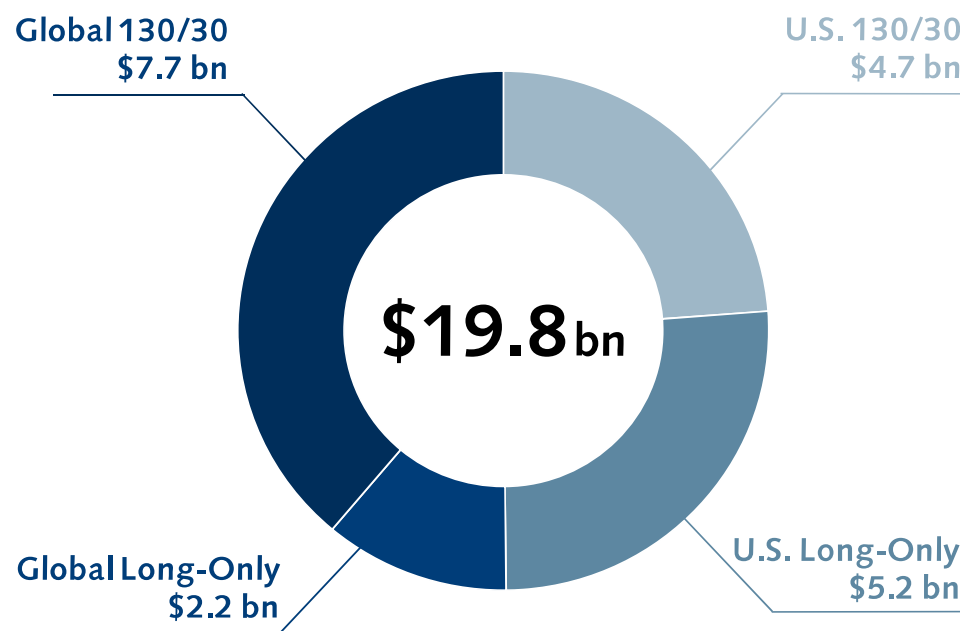
Focus on delivering high quality alpha through a broad range of disciplines across global asset classes

Risk Management

Rigorous risk management combining complementary quantitative and qualitative techniques

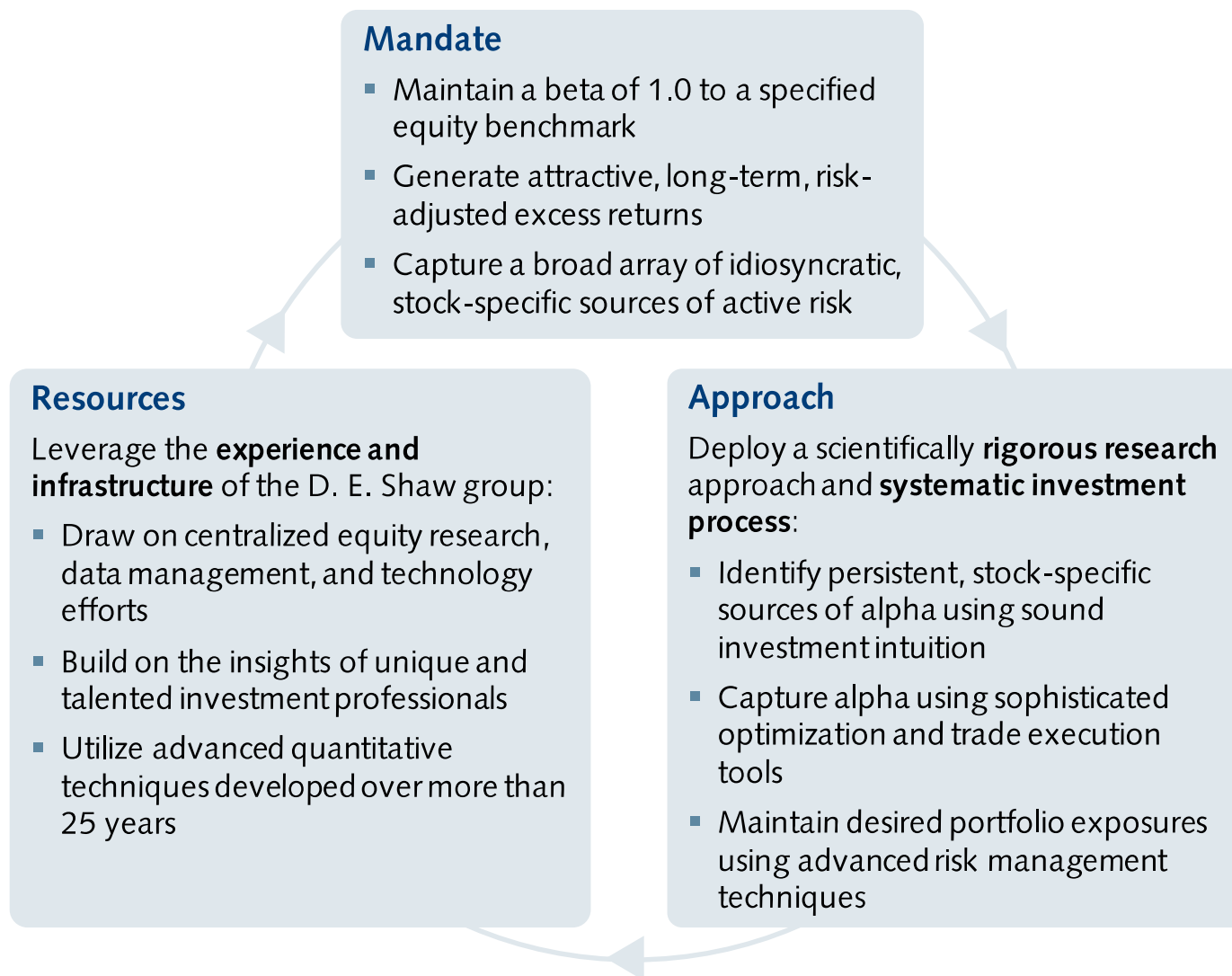
D. E. Shaw Active Equity

- A suite of benchmark-relative equity strategies that share a **single investment platform** and seek to generate attractive long-term excess returns through a **systematic, risk-aware approach** to stock selection.
- The D. E. Shaw group has been a pioneer of systematic equity investing for over 25 years and has successfully managed benchmark-relative equity portfolios for over 18 years.



No assurances can be given that any aims, assumptions, expectations, and/or goals described in this document will be realized.
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Data presented is as of December 1, 2018.

Mandate, Resources, and Approach



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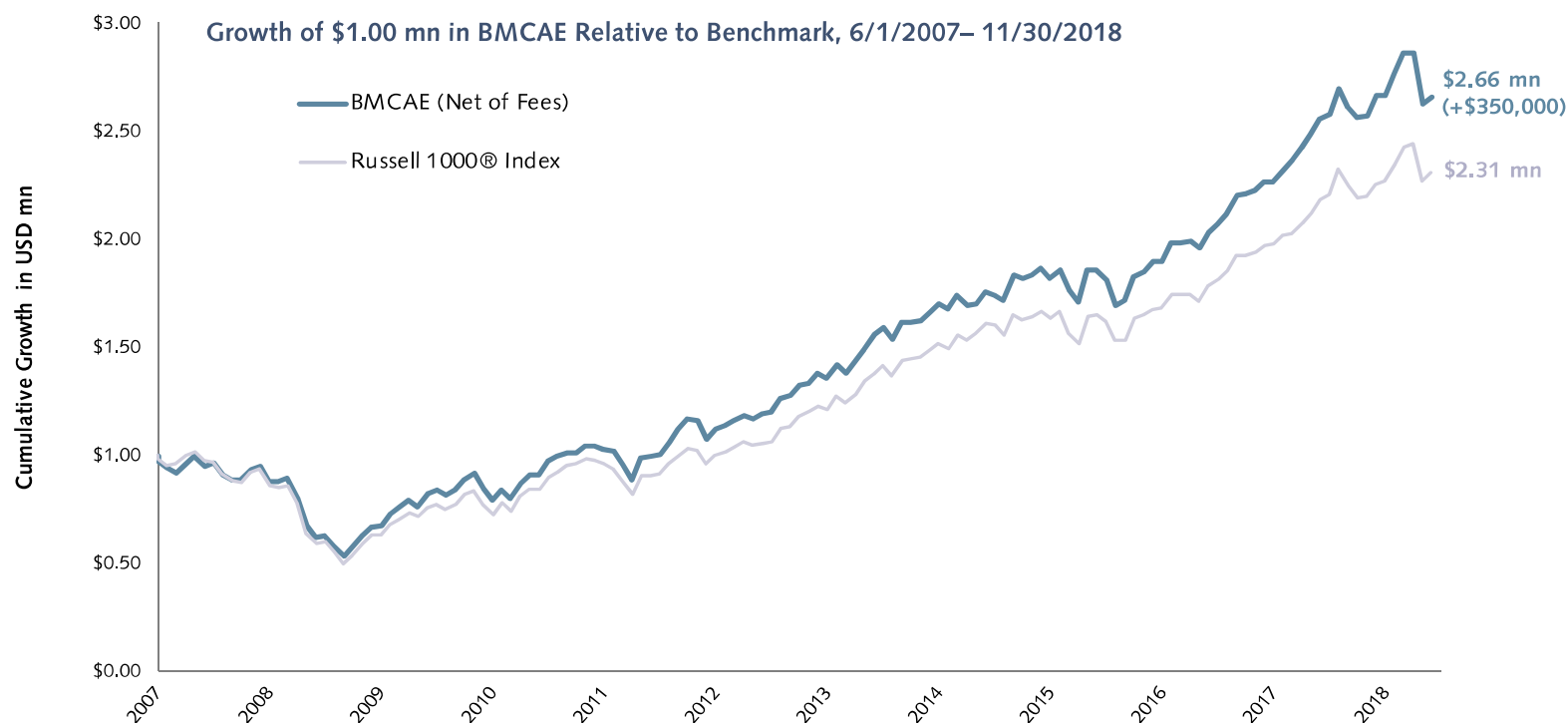
Flexible Investment Platform

A common research approach and flexible investment process allow the Active Equity platform to offer distinct strategies varying by:

Benchmark	U.S., global, and international equity indices
Implementation	Long-only or 130/30 portfolio implementations
Tracking error	Client-selected target ranging from 100 – 300 bps
Vehicle	Separate accounts and commingled funds

Broad Market Core Alpha Extension Strategy ("BMCAE")

Benchmark Index	Russell 1000® Index	Investment Approach	130/30
Annualized Tracking Error Target	300 basis points	Total Assets (as of December 1, 2018)	\$4,441 million



From June 1, 2007 (the strategy's inception date) through September 30, 2007, returns used to calculate the net-of-fees return figures were computed after deduction of a *pro forma* asset-based fee (assumed to be an annual fee of 90 basis points of assets charged monthly and paid separately by the client, and assuming no additions or withdrawals). From October 1, 2007 through November 30, 2018, returns used to calculate the net-of-fees return figures were computed after deduction of actual investment management fees and actual expenses.

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Investment Approach

Philosophy

We believe:

- financial markets are generally, but not always, efficient
- human insight can identify persistent sources of market inefficiency, and rigorous quantitative analysis can validate them
- advanced portfolio construction and risk management techniques can help profitably capture those inefficiencies for investors

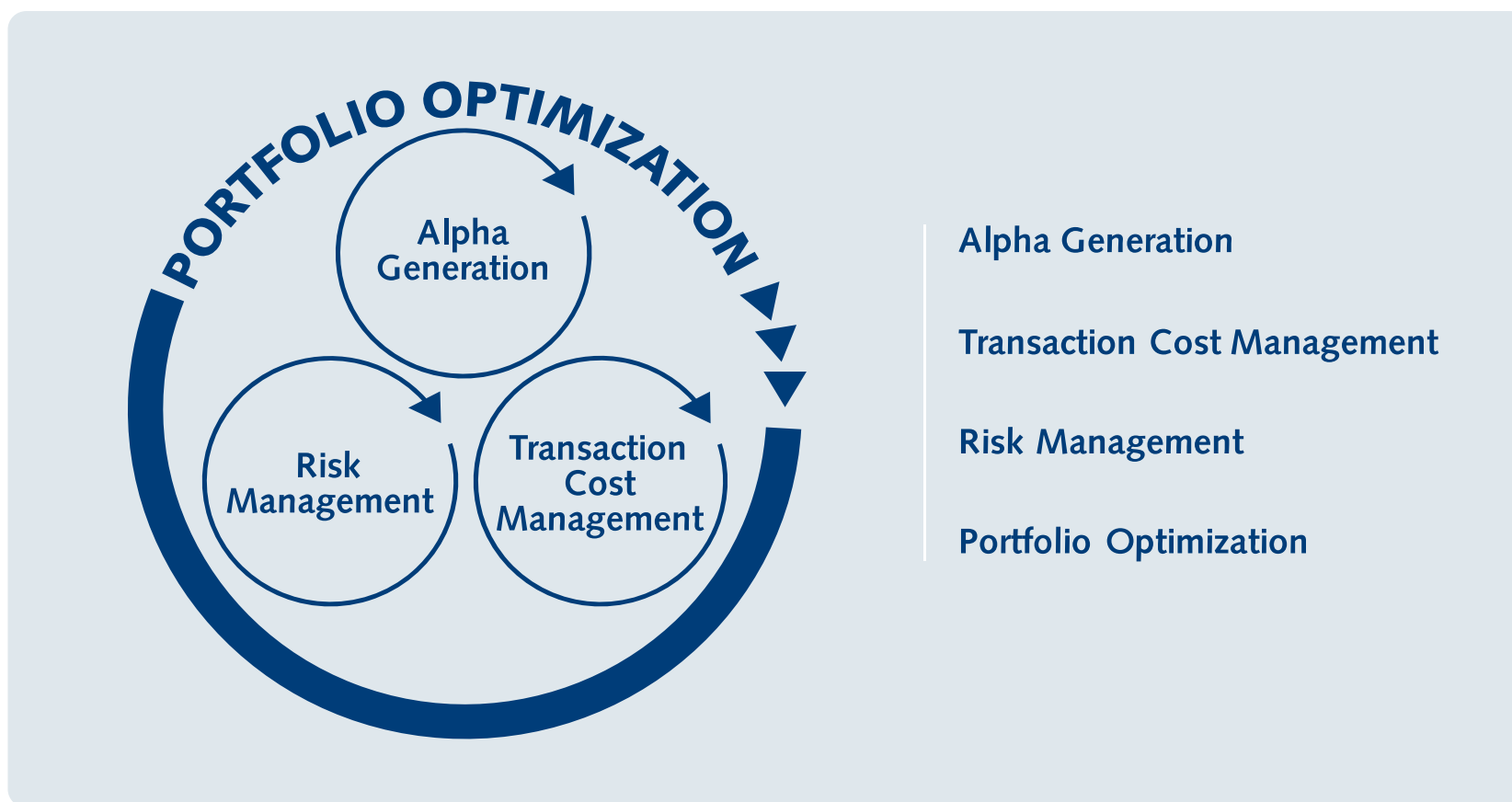
Objectives

We aim to deliver excess returns that are:

- attractive on a long-term risk-adjusted basis
- derived primarily from stock-specific sources of active risk
- lowly-correlated to conventional risk factors and to the excess returns of other managers

Investment Process

We deploy an **advanced, systematic investment process** characterized in each stage by **research-driven innovation**.



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Quantitative Equity Research

- The D. E. Shaw group's **centralized quantitative equity research effort** is led by world-class mathematicians, physicists, computer scientists, and system architects.
- That effort includes an **internal data management team** and is powered by proprietary, state-of-the-art computational infrastructure.

Research is the foundation of DESIM's
Active Equity investment process.

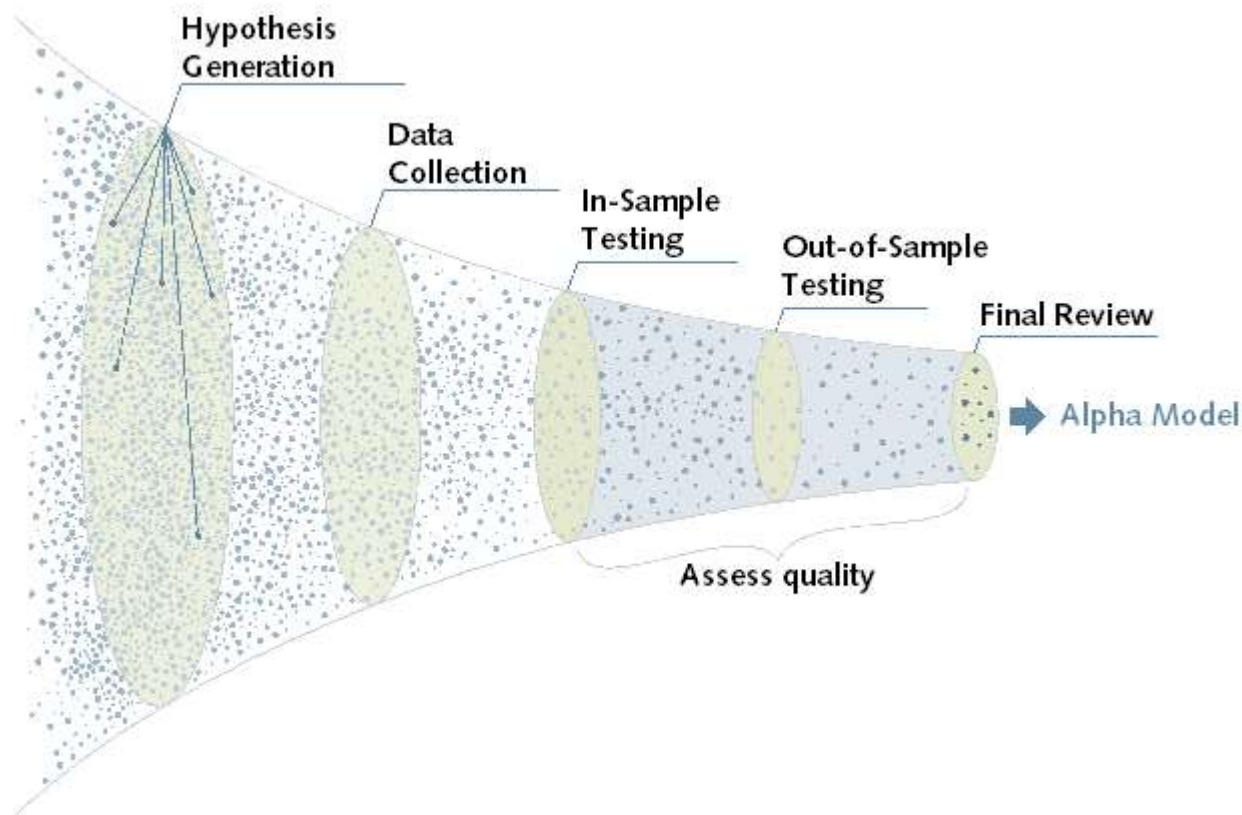
- Alpha Generation
- Transaction Cost Management
- Risk Management
- Portfolio Optimization

Data

- Access to **wide-ranging data** is critical to any successful quantitative research effort.
- Our scientific approach to financial research demands **high-quality data** that is clean and free of sampling, measurement, and look-ahead biases.
- For more than 25 years, the D.E. Shaw group has compiled and cleaned a **vast proprietary database** comprising a wide range of market and technical data, financial and accounting data, and event-related data, as well as **millions of proprietary trades** executed over the firm's history.

Alpha Research

- We believe that **disciplined, scientific research** is critical to alpha generation.
- We prioritize **intuition-driven hypotheses** about potential market inefficiencies as the starting point for potential new alpha models.



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Alpha Generation

- Active Equity deploys a **high-breadth, stock-specific approach to alpha generation.**
- Our alpha models are designed to **forecast individual stock price movement over multiple time horizons.**
- Those forecasts seek to **exploit idiosyncratic inefficiencies** and are largely **unrelated to conventional style bets** like value or size.
- Our alpha models typically exhibit **relatively low correlation** to one another, thereby contributing to **portfolio diversification.**
- We believe many of our **alpha signals are not widely known** and could be difficult to exploit using commonly-deployed investment approaches.

Transaction Cost Management

- We believe that **precise, integrated forecasting of transaction costs** makes it possible to more efficiently extract profit from an expanded universe of investment opportunities.
- The D. E. Shaw group has conducted **extensive slippage research** for more than 25 years, with the intention of producing **more accurate forecasts of market impact** resulting from our own trading.
- We believe precise transaction cost forecasting can **expand the range of economically recoverable alpha opportunities**.
- That insight, in turn, allows us to **cast a wider net for new alpha ideas** and consider potential alpha sources others may dismiss.

Risk Management

- **Sophisticated, multi-dimensional risk management** is integrated into the Active Equity investment process and has the following objectives:
 - **focus on stock selection** – concentrate active portfolio risk in idiosyncratic, stock-specific exposures;
 - **control sources of active risk** – monitor and limit exposures to a wide range of risk factors; and
 - **deliver diversifying alpha** – generate excess returns with low correlation both to common style factors and to the excess returns of other managers.

Quantitative and Qualitative Risk Management

Quantitative Approach

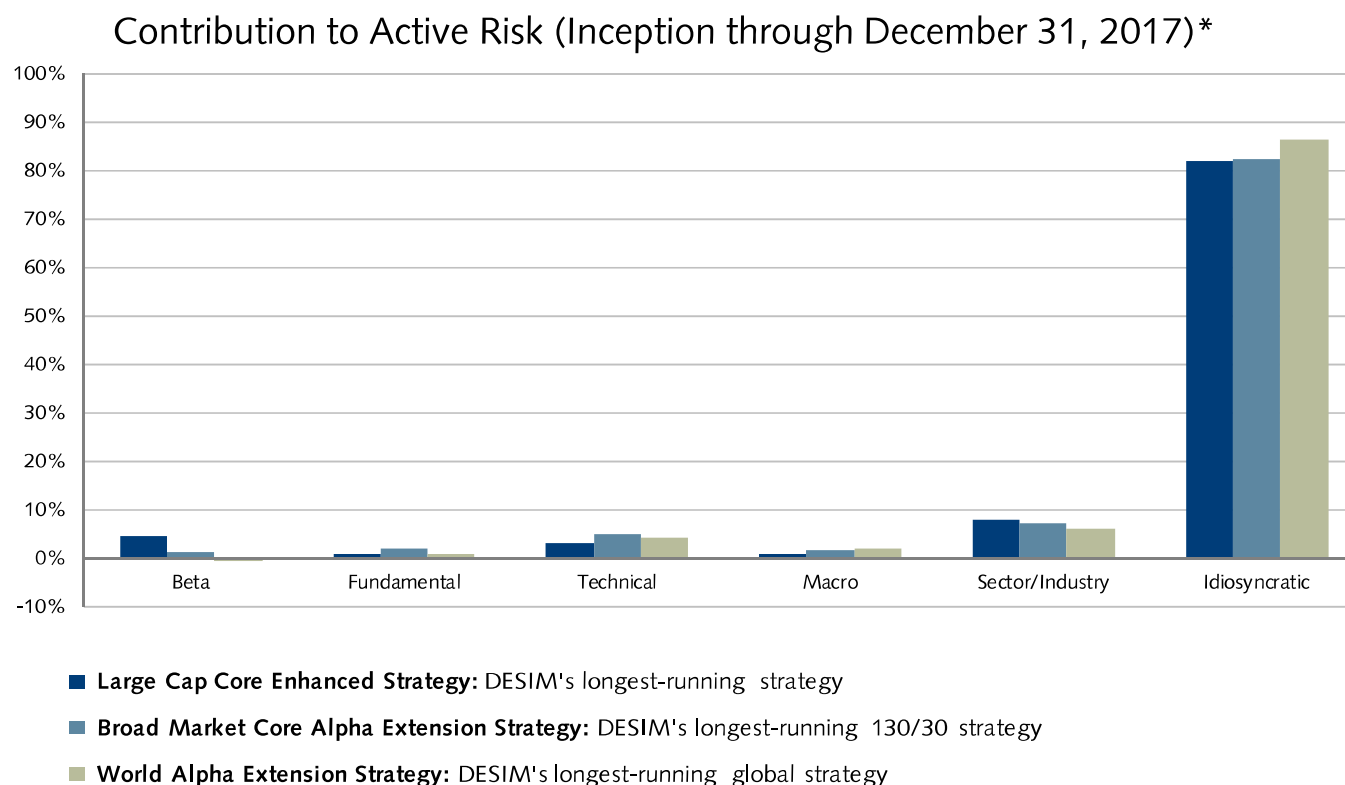
- DESIM's **proprietary, factor-based risk model** continually monitors exposure to more than 75 factors
- Exposures to those factors are managed through **limits on contribution to active risk**, rather than limits on notional exposure or active weight
- This risk model allows for **dynamic addition of new risk factors**, leveraging the D. E. Shaw group's global scope in accounting for emergent risks and market events

Qualitative Approach

- **Risk awareness underpins alpha research** supporting the Active Equity investment process
- DESIM's **investment professionals actively monitor** portfolio risks and trading activity with the aid of proprietary evaluation tools
- In rare circumstances, **human intervention** is deployed in attempt to mitigate risk in response to exceptional scenarios when a particular condition or event is not captured by the risk model

Active Risk Attribution

Long-term attribution for the Active Equity portfolios shows a substantial majority of **active risk has been derived from idiosyncratic, stock-specific exposures**, consistent with our objectives.

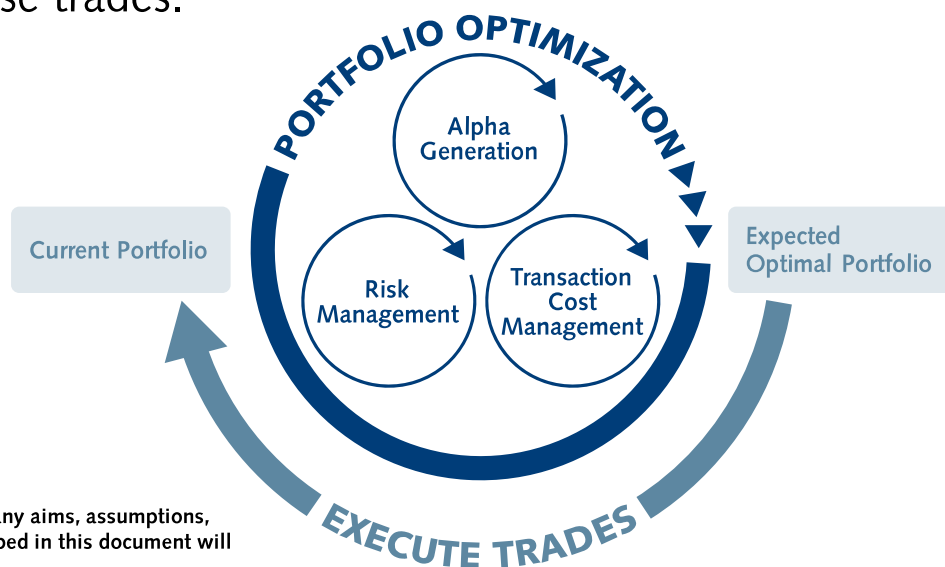


* The attribution information presented above relates to representative accounts that were managed using the D. E. Shaw Large Cap Core Enhanced ("LCCE") Strategy, the D. E. Shaw Broad Market Core Alpha Extension ("BMCAE") Strategy, and the D. E. Shaw World Alpha Extension ("WAE") Strategy, respectively. Data is presented beginning as of December 19, 2002 (the start date of LCCE's continuous track record; original inception date of LCCE was July 3, 2000) for LCCE; June 1, 2007 for BMCAE; and February 1, 2009 for WAE.

Past performance should not be considered indicative of future performance. No assurances can be given that any aims, assumptions, expectations, and/or goals described in this document will be realized. The notes and legends appearing at the end of this document are an integral part of this document.

Portfolio Optimization

- **Dynamic optimization** aims to construct portfolios that **maximize expected risk-adjusted excess returns**.
- The Active Equity portfolio optimizer:
 - cycles throughout the trading day,
 - considers all forecast-driven alpha opportunities, and
 - recommends a theoretically optimal portfolio.
- The **integrated trading system** determines the most cost-effective means of executing those trades.

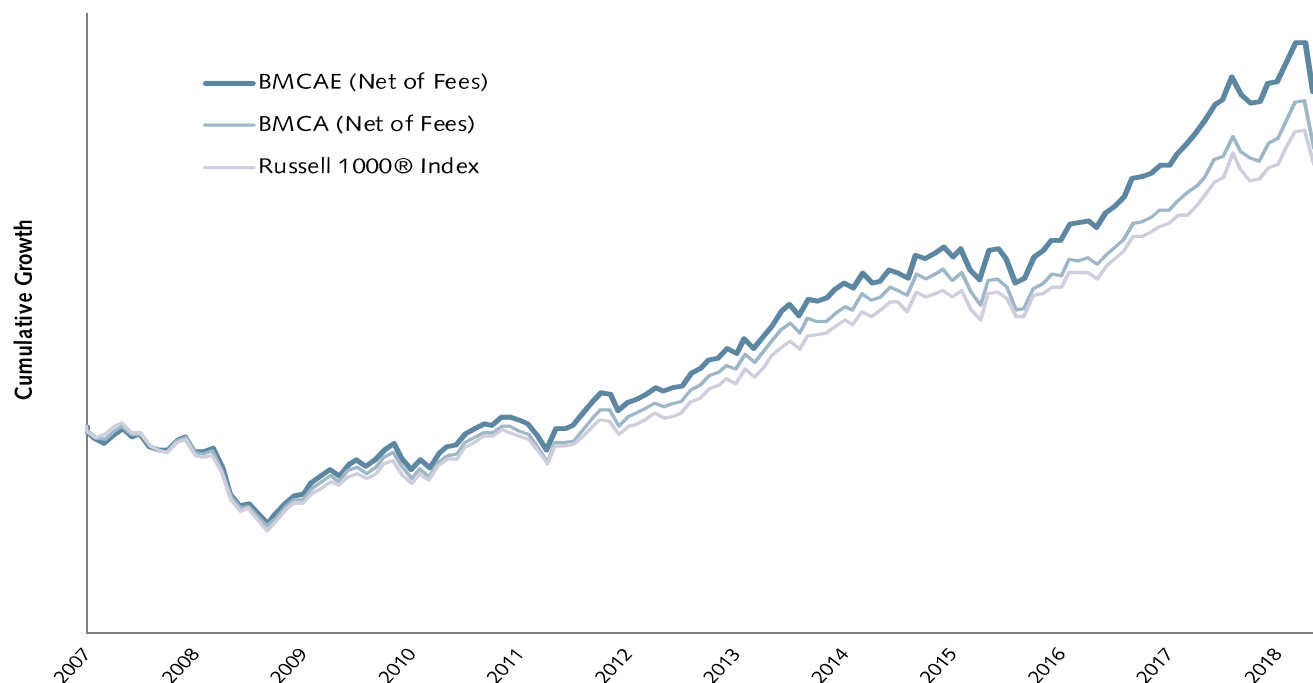


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Active Extension (130/30)

- Active extension **increases the manager's flexibility** by allowing the application of leverage and the **implementation of negative forecasts**.
- It has the potential to deliver **enhanced risk-adjusted performance**.
- Like a long-only portfolio, an active extension portfolio is fully invested and benchmark-oriented.
- Unlike a long-only portfolio, an active extension portfolio offers:
 - more scope to express forecasts,
 - greater latitude to manage risk exposures (factor, style, sector, and industry group), and
 - potential improvement to expected information ratio.

Performance Comparison



The chart above illustrates cumulative net growth of \$1 million invested in each of BMCAE and BMCA, in each case relative to the Russell 1000® Index, from June 1, 2007 (BMCAE's inception date) through November 30, 2018. For purposes of comparison, performance of BMCA from inception through May 31, 2007 is not shown.

	Broad Market Core Alpha Extension ("BMCAE")	Broad Market Core Active ("BMCA")
Benchmark Index	Russell 1000® Index	Russell 1000® Index
Annualized Tracking Error Target	300 basis points	250-300 basis points
Investment Approach	130/30	Long-Only
Inception Date	June 1, 2007	February 1, 2007

The returns for the month of November 2018 and, consequently, the other figures reflected in the graph above that include these returns in their computation are estimated and subject to material change. From each strategy's Inception Date through September 30, 2007, returns used to calculate the net-of-fees excess returns were computed after deduction of a *pro forma* asset-based fee (assumed to be an annual fee of 90 basis points for BMCAE and 63 basis points for BMCA of assets charged monthly and paid separately by the client, and assuming no additions or withdrawals). From October 1, 2007 through November 30, 2018, returns used to calculate net-of-fees excess returns were computed after deduction of actual investment management fees and actual expenses.

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Notes and Legends

Notes to Entire Presentation

Past performance and characteristics should not be considered indicative of future performance or characteristics.

All of the performance and other financial information presented herein is unaudited and, with respect to the most recent performance period shown, may not reflect (possibly material) adjustments that might result when closing the books for such period. No member of the D. E. Shaw group has any obligation to update the information in this presentation.

Performance figures and all benchmark index return figures presented reflect the reinvestment of dividends and other earnings.

Return and other information is presented for various time periods. Significant differences in return, risk, and correlations may occur within sub-periods of the periods shown. The use of other time periods would yield (possibly materially) different results. All returns presented in this document are computed in U.S. dollars.

All asset figures are presented in U.S. dollars and reflect both investment and committed capital. All asset figures presented in the charts presenting D. E. Shaw group and Active Equity assets under management are rounded to the nearest \$100 million; the constituent figures may not sum to the total presented because of rounding.

A portfolio's "beta" is the covariance of the portfolio's return with the relevant benchmark return divided by the variance of the benchmark return. "Targeted beta" is an advance estimate made by D. E. Shaw Investment Management, L.L.C. ("DESIM") of the beta that will be experienced by the applicable portfolio. Realized beta is expected to differ (possibly) materially from the targeted beta.

The "information ratio" of a portfolio is defined as the annualized excess return of such portfolio divided by the annualized tracking error of such portfolio for the relevant performance period. No assurances can be given that any aims, assumptions, expectations, and/or goals described in this presentation will be realized.

The "tracking error" of a portfolio is the standard deviation of that portfolio's excess returns relative to the benchmark index. "Targeted tracking error" is DESIM's advance estimate of the tracking error that will be experienced by the applicable portfolio over a period of years. The realized tracking error of a portfolio over any particular period is expected to differ (possibly materially) from the targeted tracking error and is expected to vary (possibly materially) in the future. No assurances can be given that any aims, assumptions, expectations, and/or goals described in this document will be realized.

All headcount figures presented herein are approximate and represent full-time-equivalent employees working in the investment-related businesses of the D. E. Shaw group. Certain headcount figures may be rounded to the nearest 5.

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Notes and Legends (Cont'd)

Notes to “Alpha Generation”

DESIM deploys various equity return forecast models in the management of its Active Equity strategies. DESIM's Active Equity strategies, and the portfolios in which such strategies are deployed, are not expected to deploy all of the equity return forecast models deployed by certain other investment strategies managed by the D. E. Shaw group.

In addition, certain strategies, equity return forecast models, and portfolio management tools are deployed on behalf of more than one Active Equity portfolio managed by DESIM; it is expected that a substantial majority of each Active Equity portfolio's capital will be invested using such shared strategies, forecast models, and portfolio management tools. Further, certain equity return forecast models deployed by the Active Equity strategies are also deployed by other D. E. Shaw group strategies—including in funds or accounts with respect to which DESIM or its affiliates receive the benefit of more favorable terms (e.g., higher fees or better expense reimbursement provisions).

For further information regarding conflicts of interest, please review the risk factors outlined in the applicable offering memorandum (in the case of a commingled fund) or in DESIM's Form ADV Part 2A.

Notes to “Active Risk Attribution”

The attribution information presented on this page aims to reflect the impact of certain categories of risk factors on the tracking error of Large Cap Core Enhanced Strategy, Broad Market Core Alpha Extension Strategy, and World Alpha Extension Strategy. Such information was generated using a proprietary risk model developed by the D. E. Shaw group. In all cases, the risk exposures and contributions measured and analyzed by the D. E. Shaw group are proprietary and may not correspond to (and may differ materially from) those used by other market participants, even if they are labeled similarly. Use of different attribution models, different risk factors, and/or different categories would result in (possibly materially) different risk attribution information.

The “Contribution to Active Risk” chart presents risk contribution information grouped into categories based on the subjective views of the D. E. Shaw group and measured by the proprietary systems of the D. E. Shaw group. Each figure represented graphically in the “Contribution to Active Risk” chart aims to reflect the amount, expressed as a percentage, of the tracking error of each portfolio that is attributable to the risk factors in each specific risk category over the applicable period.

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Notes and Legends (Cont'd)

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