



Overlay Solutions Review

Fresno County Employees' Retirement Association (FCERA)

October 17, 2019

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Firm Overview

Our Difference



Rigorous, disciplined,
and rules-based approach

\$245B+

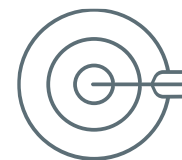
assets under management¹,
with \$154B across
institutional



Transparent, cost-effective
implementation expertise

30+

years of experience across
equity and derivative²
strategies



Customizable, flexible
solutions

400+

institutional client
relationships

Parametric in the Overlay Space

\$80B+

overlay assets under
management¹

34

dedicated investment personnel,
including 21 PM's and 12 investment
support

200+

institutional investors

All numbers are approximate as of 6/30/2019.

¹AUM includes both discretionary and non-discretionary assets of Parametric Portfolio Associates LLC (the Firm). Please refer to the disclosures for additional information regarding the Firm.

²30 years of derivative experience includes history of The Clifton Group, which was acquired by Parametric Portfolio Associates[®] on December 31, 2012.



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Not for general distribution. Overlay Solutions Performance Review

Institutional Capabilities

Customizable offerings that help solve implementation challenges, portfolio risks, and asset allocation needs



Exposure Management

- Cash Overlay Strategies
- Liability Driven Investing
- Portfolio / Asset Hedging
- Centralized Portfolio Management
- Outsourced Exposure Management

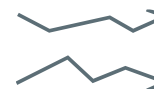
\$103B AUM



Equities

- Custom Indexing**
 - Responsible Investing
 - Factor Investing
- Systematic Equity**
 - Emerging Markets
 - Developed International

\$34B AUM



Alternatives

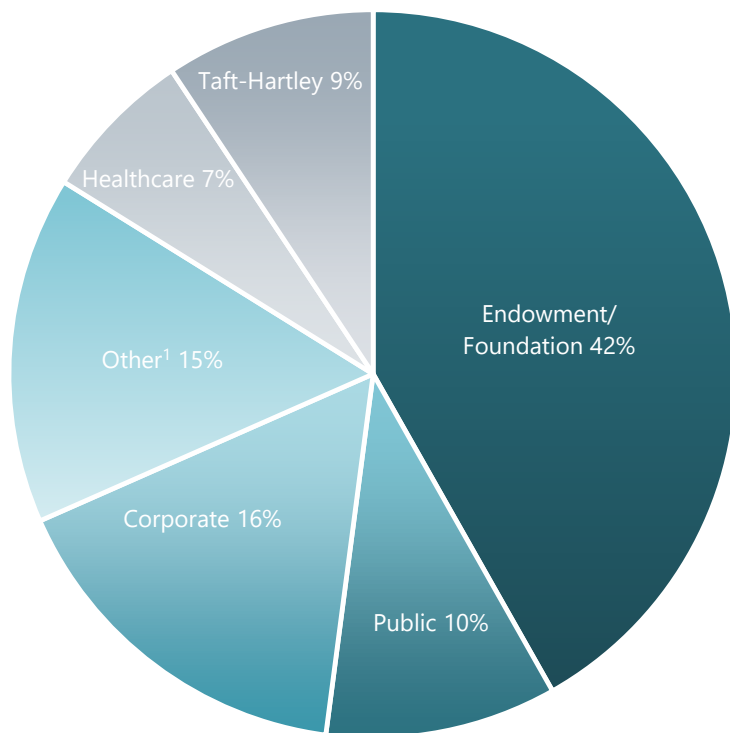
- Volatility Strategies
- Alternative Risk Premia Strategies
- Commodities

\$17B AUM

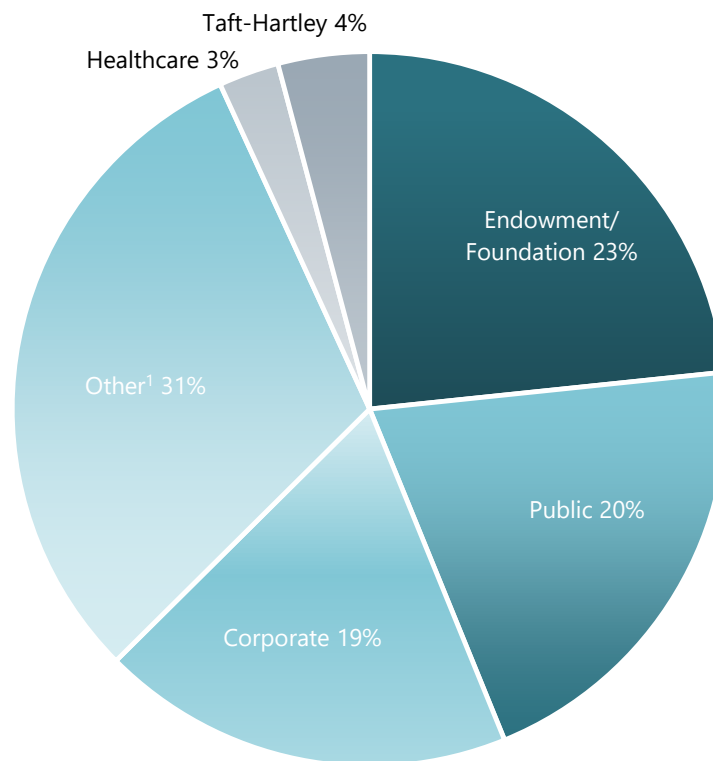
All AUM approximate as of 6/30/2019 and includes both discretionary and non-discretionary assets of the Firm.

Diversified Institutional Client Base

400+ Institutional Clients



\$154B Institutional Assets



All numbers are approximate as of 6/30/2019 and include both discretionary and non discretionary assets of the Firm.

¹Other includes; Charity, Commingled, Individual, Insurance, LP, Mutual Fund, Sub-Advisory, Superannuation.

Representative Client List as of June 30, 2019

> **Public**

East Bay Municipal Utility District
Fairfax County Retirement Systems
Houston Police Officers' Pension System
Manhattan & Bronx Surface Transit Operating Authority Pension Plan
Marin County Employees' Retirement Association
Massachusetts Pension Reserves Investment Management Board
New Mexico Public Employees' Retirement Association
Oakland Police and Fire Retirement System
Orange County Employees Retirement System
San Mateo County Employees' Retirement Association
Teachers Retirement System of Louisiana
Utah School & Institutional Trust Funds Office
Wisconsin Investment Board

> **Endowments**

Carnegie Institution of Washington
Florida State University
Indiana University & Foundation
Pepperdine University
Texas Christian University
University of Michigan
University of Minnesota
University of Pittsburgh

> **Faith Based**

Covenant Ministries of Benevolence
Ministers & Missionaries' Benefit Board of American Baptist Churches
Pension Fund of the Christian Church
YMCA Retirement Fund

> **Healthcare**

Advocate Health Care Network
The New York Presbyterian Hospital
North Memorial Health Care
Rush University Medical Center
Trinity Health

> **Taft-Hartley**

Board of Trustees ABC-NABET Retirement Trust Fund
Boilermaker-Blacksmith National Pension Trust
Carpenters, Regional Council, Greater Pennsylvania
Central Laborers' Pension Fund
Chicago Laborers' Pension & Welfare Funds
International Union of Painters and Allied Trades
National Retirement Fund
SEIU Benefit Funds
Teamsters, Western Pennsylvania

> **Foundations**

Auburn University
Doris Duke Charitable Foundation, Inc.
The John D. & Catherine T. MacArthur Foundation
The McKnight Foundation
Strada Education Network, Inc.
Wisconsin Alumni Research Foundation

> **Corporate**

The Boeing Company
Cargill Inc.
Eversource Energy
Macy's Inc.
3M Company
Target Corporation
Texas Instruments Incorporated
United Technologies Corporation

It is not known whether the listed clients approve or disapprove of the adviser. The partial list of clients included herein were selected as being representative of the different types of institutional clients and businesses serviced by Parametric. Performance-based data was not a determining factor in their selection.

Overlay Solutions Strategy Overview

Overlay Services – The Big Picture

- Overlay strategies offer a convenient, low cost means for:
 - Enhancing expected return
 - Managing risk
 - Increasing efficiency
- Institutional investors employ overlay strategies to help them better implement and achieve their policy objectives
 - Staying fully invested / eliminating cash drag
 - Efficiently rebalancing to target
- Exchange-traded futures are often utilized to add or remove exposure to a variety of asset classes
 - Integrate seamlessly into a fund's existing framework
 - Non-disruptive to existing manager portfolios

Investing in a derivatives strategy involves risk. Please refer to the Risks for additional information.

Overlay Solutions Suite

Parametric overlay solutions can help mitigate policy implementation challenges including:

Implementation challenges

Performance drag due to liquidity needs / inefficient cash flow process

Residual manager cash balance performance drag

Eliminating exposure gaps during portfolio re-allocations and manager changes

Managing / adjusting fund exposures within desired targets

Maintaining / hedging desired currency allocation

Unique exposure needs

Parametric overlay solutions ¹

Fund Cash Securitization

Manager Cash Securitization

Overlay Transition / Reallocation Management

Rebalancing / Portfolio Completion

Currency Exposure Management

Outsourced Exposure Management

Investors choose from one or more overlay solutions to create a customized program designed to alleviate specific shortfalls and inefficiencies.

FCERA utilizes the above bolded solutions

¹Client selects from the Parametric overlay solutions based on unique needs and objectives

1. Fund Cash Securitization

Challenge

- Holding cash to facilitate liquidity needs results in tracking error relative to the investment policy and creates a long-term expected performance drag

Potential Solution

- Efficiently eliminate unwanted cash exposure through the use of an overlay program while maintaining on-demand liquidity

Expected Benefits

- Increase expected return
- Increase day-to-day liquidity
- Reduce transaction costs
- Simplify the management of inflows and outflows resulting in time savings for staff

2. Manager Cash Securitization

Challenge

- Residual or transactional manager cash exposure (e.g. 1-3% of portfolio) creates an expected long-term performance drag

Potential Solution

- In non-disruptive manner, efficiently eliminate unwanted manager cash exposure through the use of an overlay program

Expected Benefits

- Increase expected return
- Maintain exposure across multiple asset classes
- Ability to customize cash overlay for each manager

Intended component may not meet benefits listed above.

3. Overlay Transition / Reallocation Management¹

Challenge

- Manager changes, manager reallocations, liquidation of illiquid holdings (e.g. hedge funds), change to target allocations, etc. which cause the fund to introduce exposure gaps and/or meaningfully deviate from target exposures

Potential Solution

- Reduce or eliminate exposure gaps using index overlays or ETFs (exchange-traded funds)

Expected Benefits

- Mitigation of exposure gaps which reduces performance risk
- The manager termination point can be accelerated or new manager search period can be extended as long as needed without losing targeted market exposure
- Exposures can be maintained during long-settled liquidations (e.g. hedge fund receivables)

4. Rebalancing

Challenge

- Asset class exposures which deviate meaningfully from long-term policy targets results in unwanted exposures and increased tracking error

Potential Solution

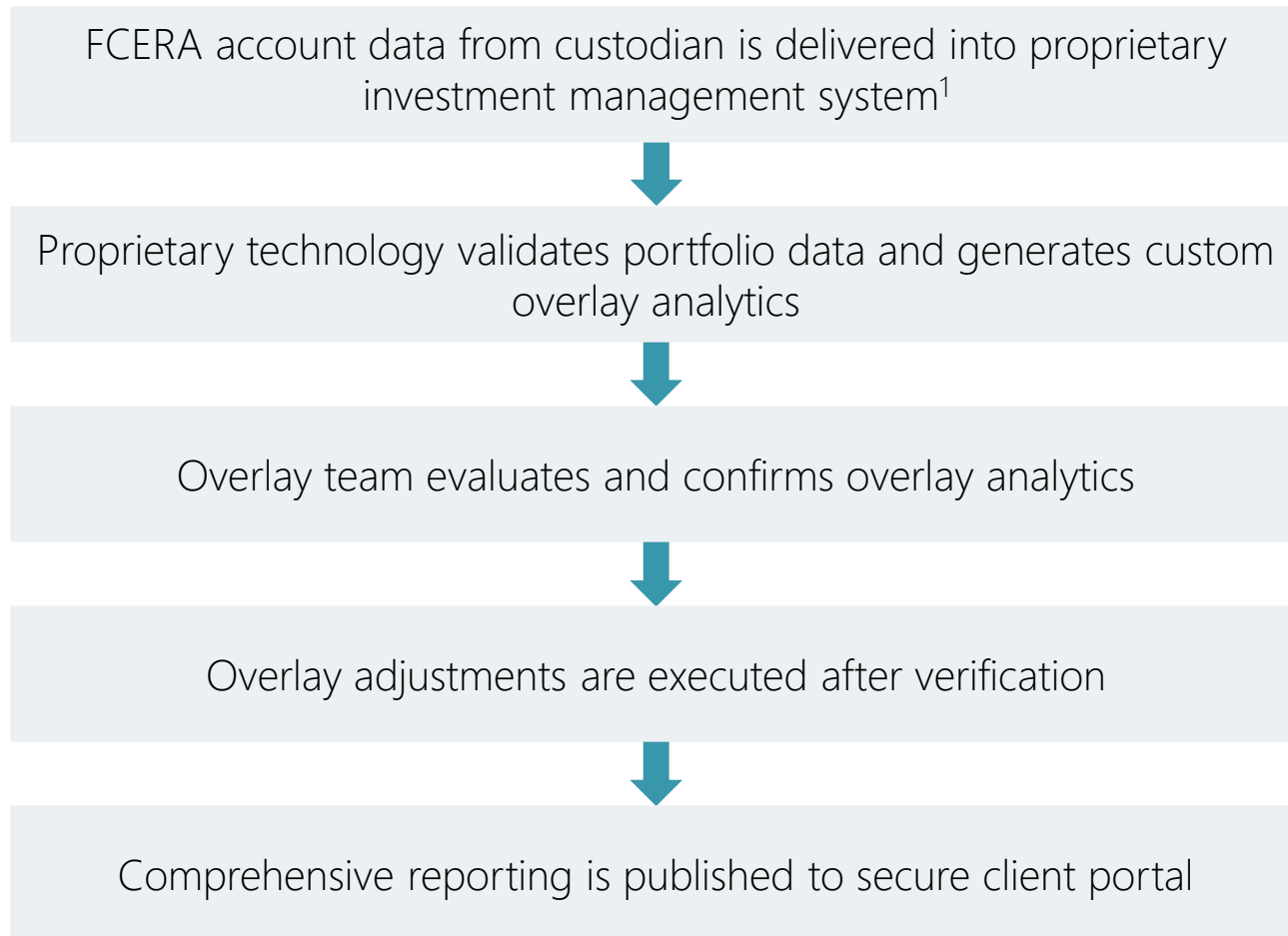
- Synthetic rebalancing of fund exposures in an efficient and cost effective manner back to desired allocation

Expected Benefits

- Reduced transaction costs
- Timely and efficient reallocation of portfolio exposures
- Minimize exposure gaps during the rebalancing process
- Reduction of tracking error

¹ Parametric works closely with transition service providers but does not transition physical portfolio holdings. Intended component may not meet benefits listed above.

Portfolio Management Process



¹ In some cases, data may not be available on a daily basis or is not accessible because the balance is held by a manager who does not make information available electronically. For illustrative purposes only.

Program Review for FCERA

FCERA Overlay Structure

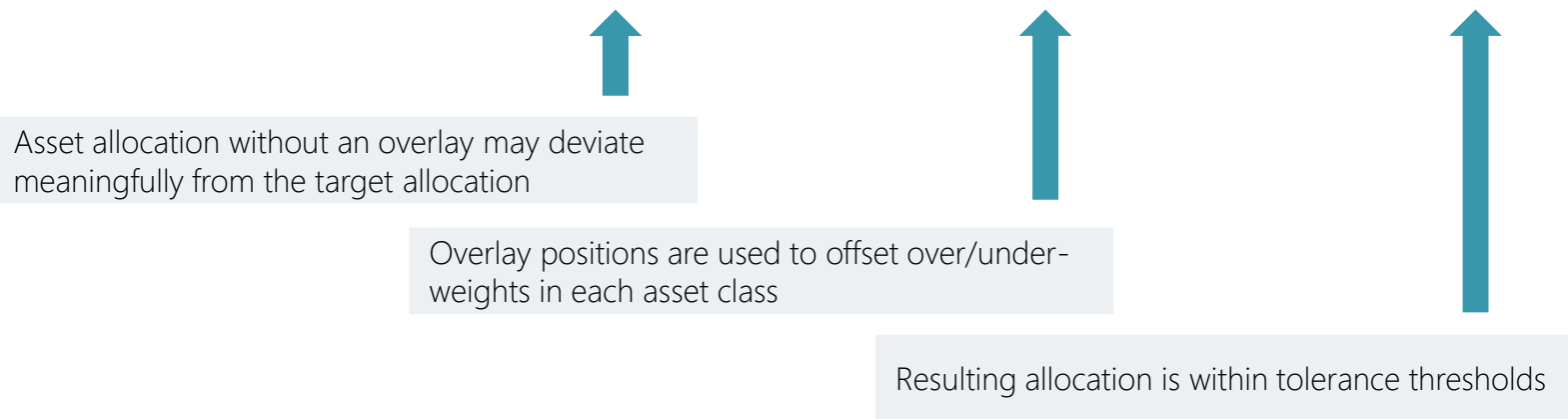
- Overlay cash held for ongoing fund liquidity needs
 - Benefit payments
 - Capital calls
- Overlay cash within certain managers' portfolios
 - Active equity separate accounts
- Bridge exposure gaps during transitions
 - (e.g. Systematic termination)
- Monitor and rebalance portfolio within predefined thresholds
- Implement portfolio glide path asset allocation steps

FCERA Program Snapshot

Parametric monitors FCERA deviations from target and seeks to:

- Reduce cash drag created from cash holdings
- Maintain target allocation across asset classes within predefined thresholds

Exposure Summary (8/31/2019)	Physical Deviation from Target		Overlay Exposure		Total Deviation from Target	
Overlay Asset Class	\$MM	%	\$MM	%	\$MM	%
Domestic Equity / Private Equity	(208.4)	-4.3%	212.9	4.4%	4.5	0.1%
International Equity	(47.2)	-1.0%	58.0	1.2%	10.8	0.2%
Global Fixed Income / Private Credit	(18.6)	-0.4%	4.7	0.1%	(13.9)	-0.3%
Cash	274.2	5.7%	(275.6)	-5.7%	(1.4)	0.0%



Asset allocation without an overlay may deviate meaningfully from the target allocation

Overlay positions are used to offset over/under-weights in each asset class

Resulting allocation is within tolerance thresholds

For illustrative purposes only. Information subject to change.
Source: Parametric

Implementation of Asset Allocation Glidepath¹

Parametric provides a framework for seamless glidepath implementation

- Update target asset allocation each quarter
- Adjust overlay exposure to maintain targets within +/- 5% proportional thresholds (e.g. 10% target has +/- 0.5% band)
- Monitor physical deviations from target within +/- 2% band and notify Staff to rebalance

Asset Class	Q3 19	Q4 19	Q1 20	Q2 20	Q3 20	Q4 20
<i>Domestic Equities</i>	22%	23%	23%	24%	24%	25%
<i>International Equities</i>	22%	22%	23%	23%	24%	24%
<i>Private Equity</i>	6%	6%	6%	6%	6%	6%
<i>Private Credit</i>	8%	8%	8%	8%	8%	8%
<i>Fixed Income</i>	27%	26%	25%	25%	24%	23%
<i>Real Estate</i>	5%	5%	5%	5%	5%	5%
<i>Infrastructure</i>	3%	3%	3%	3%	3%	3%
<i>Commodities</i>	0%	0%	0%	0%	0%	0%
<i>Hedge Funds</i>	7%	7%	7%	6%	6%	6%

¹Asset Allocations/Glidepath information provided by client.

Synthetic Glidepath Rebalancing: Example

Asset Allocation Glidepath

Asset Allocation Glidepath step calls for a 1% shift from Fixed Income → Domestic Equity

Potential Index Overlay Solution

Employ overlay positions via futures to align asset class exposures to desired targets

How it Works

- 1% Domestic Equity Index exposure is purchased and 1% Fixed Income Index exposure is sold
- Index futures exposure combined with physical fund positions produce desired asset allocation

Expected Results

- Portfolio is rebalanced without disrupting underlying manager structure
- Fund realizes transaction cost savings by utilizing futures instead of physical securities
- Portfolio exposures are rebalanced immediately, mitigating timing lags during settlement of physical manager assets
- Tracking error versus the policy benchmark may be reduced

Asset Class	Target	Actual	Futures Overlay	Deviation from Target
Domestic Equity	23%	22%	+1%	0%
International Equity	22%	22%	-	0%
Fixed Income	26%	27%	-1%	0%
Real Assets	8%	8%	-	0%
Alternatives	21%	21%	-	0%
Total	100%	100%	0% Net	0%

For illustrative purposes only. All investments are subject to loss.

FCERA Overall Program Expectations and Results

Program

- Unwanted cash exposure was reduced.
- Market environment through August, 2019 produced a net¹ synthetic index overlay return of \$35,734,725 or 0.33% (annualized) of fund assets since inception
- Increased liquidity and flexibility (e.g. transitions, glidepath implementation) in fund management
- Robust portfolio tracking available on client portal
- Improved tracking error versus benchmark index

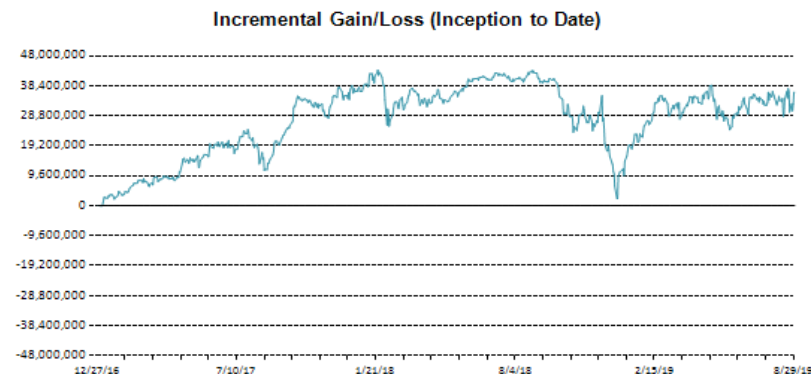
¹ Net of management fees and transaction costs. Past performance is not indicative of future results.
Please refer to disclosures in the Appendices.

FCERA Overlay Results by the Numbers

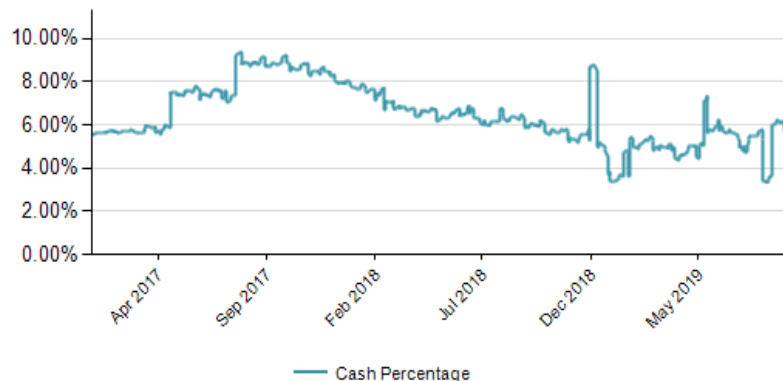
PIOS Return Summary

Overlay Performance	Incremental Gain/Loss (Net)	Return as a % of Total Fund (Net)
QTD	1,732,720	0.04%
YTD	24,754,682	0.55%
1 Year	(6,375,137)	-0.12%
Inception (12/29/2016)	35,734,725	0.33%

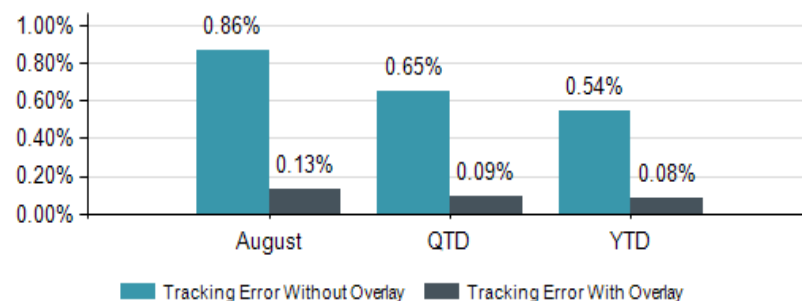
Incremental Gain/Loss (12/29/2016 – 8/31/2019)



Cash Exposure



Total Plan Tracking Error Analysis



Past performance is not indicative of future results. All investments are subject to loss. Returns are gross of management fees. The deduction of an advisory fee would reduce investor's return. Please refer to the disclosures at the end of this presentation.
Source: Goldman Sachs, Bloomberg and Parametric; Date: 9/19/2019

Other Overlay Applications

Currency Hedging



Desire to maintain or hedge currency exposures related to international equity allocations

Manage a portfolio of futures, forwards, and other FX positions to maintain the target currency allocation

- ✓ Efficient maintenance of currency allocation
- ✓ Reduction of tracking error
- ✓ Cost effective implementation
- ✓ Independent execution

Intended component may not meet benefits listed above.

Outsourced Exposure Management



Asset owners desire the ability to better control portfolio risks and exposures but lack internal capabilities, experience, or governance to implement and manage directly

Parametric executes and manages exposure through a variety of applications including:

- Core overlay applications
- Custom ETF, Treasury and Collateral management
- Custom OTC exposure
- Equity hedging
- Implementation of tactical views
- Option based strategies
- Portable alpha programs

- ✓ Active engagement in evaluating synthetic/physical strategies, implementation alternatives, and trade structuring
- ✓ Efficient execution and improved price realizations
- ✓ Management of all back-office operational functions
- ✓ Daily pricing and customized reporting
- ✓ Assist with selection of trade counterparties, management of OTC documents, and counterparty risk monitoring

Intended component may not meet benefits listed above.

Risks

Overlay Solutions: What Are the Risks?

Risk	Description	How Parametric mitigates
Market	Market performs in a way that was not anticipated. For example, cash outperforms capital markets.	Systematic market risk is an inherent part of the Overlay program and can neither be diversified away nor mitigated. Client specific policy guidelines are established to clearly define desired market risk based on client asset allocation targets.
Communication/ Information	Overlay index exposures are maintained based on underlying investment values provided by one or more third parties. There are often delays in the receipt of updated information which can lead to exposure imbalance risks. Inadequate communication regarding cash flow moves into and out of fund and manager changes can lead to unwanted asset class exposures and loss.	Parametric establishes communication links with custodial, manager, and other sources to obtain and verify positions and cash flow data as soon as it is available. Suspect data may be researched and staff notified.
Margin/Liquidity	Potential that the market moves in a manner adverse to the overlay position causing a mark-to-market loss of capital to the fund and a resulting need to raise liquidity or to close positions; this situation could happen at a time when underlying fund or positions are also declining in value.	Parametric strives to be aware of potential collateral and cash requirements to reduce the risk of needing to remove positions. Additional margin requirements are communicated via electronic mail and margin adequacy is available to the client daily.
Tracking Error	Futures (synthetic) index returns do not perfectly track benchmark index returns. This divergence between the price behavior of a position or portfolio and the price behavior of a benchmark is tracking error and impacts performance.	Parametric seeks to minimize tracking error by utilizing liquid futures contracts with sufficient daily trading volume and open interest. All derivative contracts will have some tracking error that cannot be mitigated by an overlay manager.
Leverage	Creation of market exposure in excess of underlying collateral value may lead to significant capital losses and result in position liquidation.	Parametric obtains daily collateral pool values and adjusts beta overlay positions to maintain the ratio of total exposure to collateral within a pre-defined client determined band.
Counterparty	Counterparty credit risk on OTC trading. Note: Bilateral centrally cleared OTC counterparty risk is similar to the clearing risk of holding futures investments.	Parametric can facilitate the negotiation of ISDA documentation that seeks to reduce the potential credit risk associated with OTC counterparties. Parametric monitors credit ratings and credit default swap spreads for all counterparties used and will inform staff of developments which may negatively impact credit risk.
Collateral	The program may experience losses on the underlying designated assets in addition to potential losses on the index market exposure overlaying these assets.	This risk cannot be mitigated by an overlay manager. Parametric discusses the potential for negative performance in the collateral used for the overlay prior to alpha transport applications with client.

Appendices

Exchange Traded Futures

Characteristics

- Standardized
- Regulated
- Small initial margin
- Marked to market daily (virtually eliminating credit risk)
- Liquid
- Efficiently priced with very low transaction costs
- Commonly used by Money Managers, Fund Sponsors, Index Funds, and Hedgers

Counterparty Risk Controls

- All Futures Commission Merchants ("FCM") (e.g. Goldman Sachs, Citigroup, etc.) post a performance bond, or deposit, with the clearing house in order to trade
- Performance bonds help to ensure that the FCMs will meet the contractual obligations of the trades they make
- Brokerage firms require performance bonds, in the form of initial margin, from both the contract buyer and contract seller
- FCMs must post a security deposit and pledge their assigned shares and memberships to the relevant exchange thus providing additional incremental credit protection

Synthetic Indices¹

The most often used index benchmarks are as follows:

> Domestic Equity²

- S&P 500® Index
- S&P 400® Mid Cap Index
- MSCI USA IMI Index
- MSCI Small Cap USA Index
- Russell 1000® Index
- Russell 2000® Index
- Russell 3000® Index
- Wilshire 5000 Index

> Fixed Income

- Bloomberg Barclays U.S. Aggregate Bond Index
- Bloomberg Barclays U.S. Aggregate Gov/Credit Index
- Bloomberg Barclays Intermediate U.S. Gov/Credit Index
- Bloomberg Barclays U.S. Long Gov/Credit Index
- Bloomberg Barclays U.S. Aggregate Long Treasury Index
- Bloomberg Barclays U.S. Long Treasury Index
- Bloomberg Barclays U.S. Universal Index
- Citi U.S. Broad Investment-Grade (USBIG) Bond Index
- BofA Merrill 1-3 Year U.S. Treasury Index
- Various Constant Duration Benchmarks

> International Equity

- MSCI EAFESM Index
- MSCI ACWI ex. U.S.SM
- MSCI ACWI ex. U.S. IMI
- MSCI Emerging Markets Index
- MSCI World ex. U.S.SM
- S&P Global Broad Market Index

> Global Equity

- MSCI ACWI IMI
- MSCI WorldSM

> Commodities

- S&P Goldman Sachs Commodity Index
- Bloomberg Commodities Index (BCOM)
- Custom Commodity Baskets

> International Fixed Income

- Citigroup WGBI ex. US
- Bloomberg Barclays Global Aggregate Index ex. U.S.

> Currency

- Indexes
- Individual Currency Exposure

¹Please note that only broad market (e.g. versus style) futures are available and/or liquid enough for use. Individuals may not invest directly into indexes.

²In the case of style asset exposure needs (i.e. small cap growth), Parametric can manage ETF exposures to fulfill client needs. Customized nonstandard indexes can be replicated using swaps.

For informational purposes only. This is not an offer to buy or sell securities.

Biographies: Investment Professionals

Justin Henne, CFA

Managing Director – Customized Exposure Management

Mr. Henne leads the investment team responsible for the implementation and enhancement of Parametric's Customized Exposure Management product. Since joining Parametric in 2004*, Justin has gained extensive experience trading a wide variety of derivative instruments in order to meet each client's unique exposure and risk management objectives. He earned a B.A. in Financial Management from the University of St. Thomas. He is a CFA charterholder and a member of the CFA Society of Minnesota.

Thomas Lee, CFA

Managing Director – Investment Strategy & Research

[Mr. Lee leads the investment team that oversees investment strategies managed in Parametric's Minneapolis and Westport Offices. In his current position, Tom directs the research efforts that support existing strategies and form the foundation for new strategies. He is also chair of the Investment Committee that has oversight of these strategies. Tom has co-authored articles on topics ranging from liability driven investments to the volatility risk premium. Prior to joining Parametric in 1994*, Tom spent two years working for the Federal Reserve in Washington, D.C. He earned a B.S. in Economics and an MBA in Finance from the University of Minnesota. He is a CFA charterholder and a member of the CFA Society of Minnesota.

Chris Haskamp, CFA

Senior Portfolio Manager

Mr. Haskamp is dedicated to portfolio management and leading research projects in the area of risk management. Chris manages portfolios for the Liability Driven Investing program as well as for the enhanced index programs. Prior to joining Parametric in 2006*, he spent three years as a scientist at the medical device firm Beckman Coulter Inc. Chris earned a B.S. in Biochemistry from the University of Minnesota and a M.S. in Chemistry from the University of California, San Diego. Chris earned an MBA in Finance from the University of Minnesota, Carlson School of Management in May of 2007 and started full time at Parametric in June of 2007. He is a CFA charterholder and a member of the CFA Society of Minnesota.

Richard Fong, CFA

Senior Portfolio Manager

Mr. Fong leads a team of investment professionals responsible for designing, trading, and managing overlay portfolios. Since joining Parametric in 2010*, Ricky has become a valuable resource supporting management of client LDI and options-based risk management solutions. He earned a B.A. in Financial Economics from Gustavus Adolphus College. He is a CFA charterholder and a member of the CFA Society of Minnesota.

Clint Talmo, CFA

Senior Portfolio Manager

Mr. Talmo leads a team of investment professionals responsible for designing, trading, and managing customized overlay portfolios utilizing a wide spectrum of asset classes across global markets. Prior to joining Parametric in 2014, Clint was a Partner at Aerwulf Asset Management. Previously, he worked for Interlachen Capital Group and EBF & Associates where his responsibilities included research, trading, and portfolio management. He earned a B.S. in Finance from the University of Colorado. He is a CFA charterholder and a member of the CFA Society of Minnesota.

*Reflects the year employee was hired by The Clifton Group, which was acquired by Parametric Portfolio Associates® LLC on December 31, 2012.

Biographies: Investment Professionals

Dan Wamre, CFA

Senior Portfolio Manager

Mr. Wamre leads a team of investment professionals responsible for designing, trading, and managing overlay portfolios. He has extensive experience helping clients and consultants manage portfolio exposures and risk through futures and options-based strategies. Prior to joining Parametric in 1995* as an intern, and full-time in 1998*, Dan spent four years as a Platoon Commander/Executive Officer in the United States Marine Corps. Upon completion of graduate school, he spent ten months working as a commercial banking credit analyst for U.S. Bank in Minneapolis. He earned a B.S. from North Dakota State University and an MBA in Finance from the University of Minnesota. He is a CFA charterholder and a member of the CFA Society of Minnesota.

Alex Braun, CFA

Portfolio Manager

Mr. Braun leads a team of investment professionals responsible for designing, trading and managing overlay portfolios. Prior to joining Parametric in 2010*, Alex interned at Imperial Capital (formerly Mercanti Group). He earned a B.S. degree in Finance and Accounting from the Carlson School of Management at the University of Minnesota. He is a CFA charterholder and a member of the CFA Society of Minnesota.

*Reflects the year employee was hired by The Clifton Group, which was acquired by Parametric Portfolio Associates® LLC on December 31, 2012.

Biographies: Institutional Sales & Service

Michi McDonough, CFA, CAIA

Managing Director, Head of Client and Consultant Relations

Ms. McDonough lead Parametric's consultant relations and institutional client relationship management teams. Prior to joining Parametric in 2013, she was Vice President and Consultant Relations Manager at Wellington Management. Ms. McDonough earned a BA in Economics from Emory University and an MBA, magna cum laude, from Babson College. She is a CFA® charterholder, a member of the CFA Society of Boston, and also holds the CAIA designation.

Christopher Uhas, CFA

Managing Director, Head of Institutional Business Development

Mr. Uhas joined Parametric in 2007* and is responsible for leading Parametric's institutional business development team, working closely with investors in the United States and Canada. Before entering the investment management industry, he was the Director of New Product Launch for Seagate Technology, based in Singapore, and also served for five years as a nuclear-trained submarine officer in the United States Navy. He earned a B.S. in Electrical Engineering from the University of Notre Dame, and an MBA from the University of Chicago Booth School of Business. He is a CFA charterholder and a member of the CFA Society of Minnesota. *Reflects the year employee was hired by The Clifton Group, which was acquired by Parametric Portfolio Associates® LLC on December 31, 2012.

Ben Lazarus, CFA

Senior Director – Institutional Relationships

Mr. Lazarus joined the firm in 2004*. He is responsible for developing, coordinating, and executing the business development and client services plan for Parametric unique family of products with emphasis on the Western region of the United States and Canada. In addition, Ben works on developing and managing new partnerships for Parametric and has presented on the use of derivatives at different industry events. From 2015 to 2016, he was the Senior Vice President of US Sales at Nuveen Investments in Minneapolis, Minnesota. Ben earned a B.A. in Psychology from the University of California, San Diego and an MBA in Marketing and Strategic Management from the University of Minnesota. He is a CFA® charterholder and a member of the CFA Society of Minnesota.

*Reflects the year employee was hired by The Clifton Group, which was acquired by Parametric Portfolio Associates® LLC on December 31, 2012

Greg Baranivsky, CFA

Senior Director – Institutional Relationships

Mr. Baranivsky is responsible for developing, coordinating, and executing the sales and marketing strategies for Parametric's unique family of products in the Upper Midwest sales territory. Prior to joining Parametric in 2010*, Greg spent 12 years at First American Funds/FAF Advisors (now Nuveen Asset Management) in various sales, national accounts, and product management leadership roles. Prior to First American Funds/FAF Advisors, Greg worked for Van Kampen Investments (now Invesco) within its product management group. He earned a B.A. from Benedictine University and an MBA from the Illinois Institute of Technology. He is a CFA charterholder, is a member of the CFA Institute and the CFA Society of Minnesota where he previously served as a member of its board of directors.

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Biographies: Institutional Sales & Service

Greg Bauer, CFA, CAIA

Director – Institutional Relationships

Mr. Bauer is responsible for developing, coordinating, and executing the sales and marketing strategies for Parametric's unique family of products in the Southeast region of the United States. Prior to joining Parametric in 2015, Greg worked at Crawford Investment Counsel where he was the Director of Institutional Services, responsible for leading the institutional sales and consultant relations efforts. Prior to Crawford, Greg worked for both Callan Associates and NEPC. Greg earned a B.A. from Brown University and an MBA from the Georgia Institute of Technology. Greg is a CFA charterholder and a member of the CFA Society of Atlanta. He also holds a CAIA designation.

Christopher Powers, CFA, CAIA

Director – Institutional Relationships

Mr. Powers is responsible for coverage of institutional investors in the Northeast (US) and Canada. Prior to joining Parametric in 2018 Chris spent 5 years at RBC Global Asset Management as a Director on the institutional sales team covering the Northeast (US). Prior to RBC Chris spent 2.5 years at Eaton Vance. He earned a Bachelors of Science in Economics from Trinity College (CT). He is a CFA and CAIA charterholder and a member of the CFA Society of Boston.

Bryan Sandvig

Director – Institutional Relationships

Mr. Sandvig is responsible for building institutional relationships in the Central region of the United States. Prior to joining Parametric in 2017, Bryan worked at Cornerstone Capital Management as Vice President, Business Development where he managed institutional relationships and consultant relations. Prior to Cornerstone Capital Management, Bryan began his investment career at First Trust Portfolios as an Internal Consultant for Exchange-Traded Funds and Separately Managed accounts in the Southeast Region of the United States. He earned a B.A. in Business and Economics from Wheaton College (Wheaton, IL).

Daniel Ryan

Senior Director – Relationship Management

Mr. Ryan is responsible for managing client relationships throughout the Western U.S. Prior to joining Parametric in 2013, Dan was Vice President and Senior Relationship Manager at State Street Global Advisors. He earned a B.A. in History from the University of Michigan.

Jason Chalmers

Director – Relationship Management

Mr. Chalmers is based in Boston and is responsible for managing client relationships throughout the Eastern United States. Prior to joining Parametric in 2014, Jason was a Vice President and Relationship Manager at Acadian Asset Management LLC. He earned a B.S., Economics, Northeastern University, and a M.S., Finance, Boston College Carroll School of Management.

Jeremy Smith, CFA

Director – Relationship Management

[Bio] Mr. Smith has lead client relationship management responsibilities for Parametric's Volatility and Alternative Risk Premium clients. Prior to joining Parametric in May 2017, Jeremy worked for Allianz Life leading their Investment Management division's Business Development team. During his tenure at Allianz Life, Jeremy also held positions leading the Investment Management division's Variable Annuity Advisory Management team and worked as a Senior Investment Analyst. He earned a Bachelor in Business Administration from the University of Minnesota Duluth. He is a CFA charterholder and a member of the CFA Society of Minnesota.

*Reflects the year employee was hired by The Clifton Group, which was acquired by Parametric Portfolio Associates® LLC on December 31, 2012.

Biographies: Institutional Sales & Service

William Busch

Director – Consultant Relations

Mr. Busch is responsible for developing and maintaining relationships within the institutional investment consultant community. Prior to joining Parametric in 2015, Bill held positions at State Street Global Advisors in Consultant Relations and as a Product Analyst. Bill earned a B. A. in Sociology and Spanish from Bowdoin College, and an MBA from the Carroll School of Management at Boston College.

Jaylene Howard, CFA, CAIA

Director – Consultant Relations

Ms. Howard is responsible for developing and maintaining relationships with institutional investment consulting firms in the western U.S. In her role, she partners with institutional consultants, building awareness of Parametric's capabilities in investment management and implementation services. Prior to joining Parametric in 2018, Jaylene worked at Canterbury Consulting as a Consultant providing strategic investment advice to endowments, foundations, corporations and ultra-high net worth families. Before that, she worked at Russell Investments as a Consulting Director where she was responsible for delivering market and economic insights and portfolio strategy advice to investment professionals and individual investors. She earned a B.A. in Economics and History from Gonzaga University. She is a CFA charterholder and a CAIA charterholder. Jaylene currently serves on the board of Seattle Preparatory School and is a member of the CFA Society of Seattle.

Disclosure

Parametric Portfolio Associates LLC is an independent investment adviser registered under the Investment Advisers Act of 1940. Parametric Portfolio Associates LLC provides rules-based investment management services to institutional investors, individual clients and registered and non-registered investment vehicles including Systematic Alpha and Income Strategies, Custom Core, Centralized Portfolio Management (CPM), Overlay Services, Customized Exposure Management (CEM), Volatility Risk Premium (VRP), and Systematic Alternative Risk Premia (SARP). The Firm has complied with the GIPS standards retroactive to January 1, 2000.

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Benchmark/index information provided is for illustrative purposes only. Investors cannot invest directly in an index. Returns for indexes are calculated gross of management fees. Deviations from the benchmarks provided herein may include but are not limited to factors such as: the purchase of higher risk securities, over/under weighting specific sectors and countries, limitations in market capitalization, company revenue sources, and/or client restrictions. Parametric's proprietary investment process considers factors such as additional guidelines, restrictions, weightings, allocations, market conditions and other investment characteristics. Thus returns may at times materially differ from the stated benchmark and/or other disciplines and funds provided for comparison.

Derivatives such as futures, swaps, and other investment strategies have certain disadvantages and risks. Futures require the posting of initial and variation margin. Therefore, a portion of risk capital must be preserved for this purpose rather than being allocated to a manager. Liquid futures may not exist for published benchmarks which may result in tracking error. Also, some intra-period mispricing may occur. Swaps require periodic payments, may be less liquid than futures, and may have counterparty/credit risk. Some investment strategies require a cash investment equal to the desired amount of exposure.

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Parametric is headquartered at 800 5th Ave Suite 2800, Seattle, WA 98104. Parametric's Minneapolis office is located at 3600 Minnesota Drive, Suite 325, Minneapolis, MN 55435. For more information regarding Parametric and its investment strategies, or to request a copy of Parametric's Form ADV, please contact us at 206.694.5575 (Seattle) or 952.767.7700 (Minneapolis), or visit our website, www.parametricportfolio.com.

PIOS® Composite

Parametric Investment & Overlay Strategies

PIOS Composite Performance Presentation

As of December 31, 2018

Period	Returns			3 Yr. Annualized Standard Deviation		Dispersion	Assets		
	Total Gross Return AWR	Total Net Return AWR	Index	Composite	Index	Internal Equal Wtd.	Number of Portfolios *	Composite (MM) *	Total Firm (MM) *
2009	8.70%	8.54%	-	-	-	13.56%	128	17,483	-
2010	6.59%	6.43%	-	6.19%	-	7.20%	140	20,853	-
2011	2.80%	2.65%	-	5.53%	-	7.10%	188	19,771	-
2012	5.20%	5.04%	-	4.50%	-	5.22%	206	22,547	63,431
2013	4.81%	4.65%	-	3.54%	-	9.46%	215	30,045	80,896
2014	2.98%	2.83%	-	2.76%	-	6.11%	270	36,290	94,545
2015	-0.86%	-1.01%	-	2.82%	-	5.60%	333	43,711	99,248
2016	3.40%	3.24%	-	2.69%	-	8.53%	334	46,915	111,470
2017	9.03%	8.87%	-	2.97%	-	9.69%	335	45,026	137,760
2018	-2.86%	-3.01%	-	3.34%	-	5.17%	354	37,077	122,628

* The composite was not included in the Firm Assets prior to 2012 as it was being managed by a prior firm.

Index: None

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Prior to July 1, 2019, the firm included only the Parametric Investment & Overlay Strategies. On July 1, 2019, the firm was redefined to include the Parametric Custom Tax-Managed & Centralized Portfolio Management Strategies. For the purpose of complying with the GIPS standards, the Firm is defined and held out to the public as Parametric Portfolio Associates LLC.

Parametric Portfolio Associates LLC claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. Parametric Portfolio Associates LLC has been independently verified for the periods January 1, 2000 to December 31, 2018. The verification report is available upon request.

Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

The PIOS (Policy Implementation Overlay Service) Composite is comprised of all fully discretionary separate accounts that create custom overlay solutions designed to help investors achieve policy objectives. The PIOS strategy utilizes an array of investment instruments to achieve client objectives through adherence to detailed investment guidelines. Objectives can include interest rate management, currency management, rebalancing, transition management, cash securitization and neutralizing policy performance shortfalls.

PIOS[®] Composite (Continued)

Parametric Portfolio Associates LLC

Composite creation date is December 2013.

This composite is not compared against a benchmark. There is no observable benchmark or index that exists with an objective similar to that of the strategy. It is not possible to directly invest in an index.

Derivative securities are used in the accounts which comprise this composite. The firm's strategies contain derivatives such as futures, options, swaps, and other investment strategies that may involve certain advantages and risks. Futures require the posting of initial and variation margin. Therefore, a portion of risk capital must be preserved for this purpose rather than being allocated to a manager. Swaps require periodic payments, which may be less liquid than futures, and certain swaps may have counterparty/credit risk. Some investment strategies may require a collateral investment equal to the desired amount of exposure.

Portfolio returns are calculated based on the sum of the daily gain/loss in the client account divided by the total portfolio value of the previous month end. The total portfolio value is the market value of the client's manager portfolios, as defined in the guidelines. The client account overlay target value at the prior month end is used for the composite asset weighted performance calculation.

Portfolio returns reflect the reinvestment of dividend and interest income.

Performance results are expressed in U.S. dollars.

Composite gross returns are after transaction costs and other direct expenses, but before management fees. Net returns reflect the deduction of model investment management fees, 0.15%. The fees for the investment management services herein are described in the fee schedule.

The separate account management fee schedule is as follows: First \$50M @ 0.15%; Thereafter @ 0.10%.

The dispersion of annual returns is measured by equal-weighted standard deviation of portfolio returns within the composite for the full year.

Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

A list of composite descriptions is available upon request.

Performance prior to January 2013 was achieved by the Clifton Group Investment Management prior to its merger with Parametric Portfolio Associates, LLC and has been linked to the performance history of Parametric Investment & Overlay Strategies. Performance results prior to January 2013 should not be interpreted as the actual historical performance of Parametric Investment & Overlay Strategies. Parametric Investment & Overlay Strategies has adhered to the performance record portability requirements of the GIPS standards in regard to the presentation and linking of this performance track record.

Past performance is not a guarantee of future results.