


# Commonwealth of Pennsylvania Public School Employees' Retirement System

**DATE:** July 26, 2012

**SUBJECT:** PIMCO Multi-Asset Volatility Offshore Fund Ltd. Recommendation

**TO:** Members of the Board

**FROM:** Robert E. Little, CPA   
Portfolio Manager, External Public Markets

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At the August Finance Committee meeting, staff and Aksia will recommend that PSERS invest in the PIMCO Multi-Asset Volatility Offshore Fund Ltd. (Fund). This Fund is an open-ended fund that uses derivatives to generate returns in the financial and commodity markets.

Founded in 1971, PIMCO is a leading fixed income asset management firm with over \$1.7 trillion in assets under management and over 2,000 employees worldwide. PIMCO has managed money for PSERS since 1987. The Multi-Asset Volatility strategy looks to generate positive returns that have low correlations with other asset classes by trading on market volatility and market mispricings. Since the fund's inception in July 2011, the strategy has returned 28.88% with a volatility of 7.43% for a Sharpe ratio of 3.88. The Fund has low correlations to major equity, commodity, and fixed income indices, to our existing large absolute return program managers, and to our existing PIMCO PARS/GCOF portfolio. By combining the Fund in a portfolio with our existing PARS/GCOF exposure, PSERS benefits from a netting arrangement so that the performance fee is calculated on the combined portfolio and not on each individual fund.

Staff recommends a \$220 million investment to this Fund, an amount which is within the target ranges established in Exhibit D of the Investment Policy Statement, Objectives and Guidelines as amended from time to time. An incremental \$200 million will be allocated to the new PARS/GCOF/MAV portfolio. An additional \$20 million will be raised from our existing PARS/GCOF investments. Staff's objective is to have the total allocation to this portfolio be approximately \$660 million with one-third of the portfolio invested in each strategy – PARS, GCOF, and MAV.

Included for your review are Aksia's recommendation, a presentation prepared by staff, a presentation prepared by PIMCO, and the resolution recommending the investment in the Fund. The fund terms, which are considered to be confidential, will be distributed at the meeting. Representatives from PIMCO will make a presentation to the Finance Committee and will be available for any questions.

If you have any questions or comments prior to the meeting, please contact me at 717-720-4707.

## Manager Recommendation Memo

July 24<sup>th</sup>, 2012

Board of Trustees  
Pennsylvania Public School Employees' Retirement System  
5 North Fifth Street  
Harrisburg, PA 17101

Re: PIMCO MAV

Dear Trustees:

Aksia LLC, having been duly authorized by the Board of PSERS, has evaluated and herewith recommends a direct allocation to PIMCO's Multi-Asset Volatility Fund ("PIMCO MAV"). In the ongoing development of PSERS' portfolio of absolute return funds, Aksia recommends an initial allocation in line with Exhibit D of PSERS Investment Policy Statement, Objectives, and Guidelines.

PIMCO, a manager with whom PSERS has existing investments, offers a market-neutral volatility strategy. It seeks to take advantage of perceived supply-demand imbalances in options and other derivatives across equities, currencies, interest rates, and commodities, driven by market forces such as increased demand for tail hedging. MAV positions itself as a seller where volatility is believed to be overpriced, and conversely, a buyer where the manager believes it to be cheap.

Aksia's recommendation is based upon the following analytical factors and is made within the context of PSERS' investment guidelines.

- Due diligence of PIMCO MAV's investment strategy, including a review of their investment strategy, investment team and structure, and risk management process.
- Due diligence of PIMCO MAV's operations, including an operations and infrastructure review, regulatory and compliance review, private placement memorandum review, Form ADV review, and financial statement review.
- Evaluation of PIMCO MAV's investment strategy within the context of the current investment environment.
- Appropriateness of PIMCO MAV for the Absolute Return component of PSERS' portfolio.

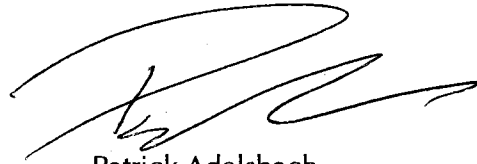
This recommendation is confidential, given solely for the benefit of PSERS and cannot be relied upon by other investors considering an investment in PIMCO MAV, since their needs, objectives and circumstances may not be identical to those of PSERS. The scope of this recommendation is limited to the investment merits of the PIMCO Multi-Asset Volatility Fund. Aksia manager recommendation memos should be reviewed with other Aksia due diligence materials, including the full Investment Review and Operational Review. In addition, please consult your tax, legal and/or regulatory advisors before allocating to any private investment fund.

Please feel free to contact us should you have any questions about this recommendation.

Respectfully,



Bruce Ruehl  
Partner, Head of Portfolio Advisory, Americas



Patrick Adelsbach  
Partner, Head of Event Driven

An Introduction on PIMCO's Multi-Asset Volatility Fund

# Pennsylvania Public School Employees Retirement System

8 August 2012

Information provided in this presentation must be read in conjunction with the Private Placement Memorandum, which contains additional important risk disclosures and other important information. This is neither an offer to sell nor a solicitation of an offer to buy interest in a fund. Offers are made solely pursuant to the Private Placement Memorandum. This material has been prepared for informational purposes only, and is not intended to provide, and should not be relied on for, accounting, legal or tax advice. You should consult your tax or legal adviser regarding such matters. Only qualified investors may invest in the Fund.

PIMCO advised funds are distributed by **PIMCO Investments LLC**.

For Qualified Investor Use Only

# Biographies

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## **Libby Cantrill, CFA**

Ms. Cantrill is a senior vice president based in New York and works in PIMCO's Executive Office, focusing on public policy issues and working with public pension clients. Prior to joining PIMCO in 2007, she was in the investment banking division at Morgan Stanley and served as a legislative aide to a member of Congress in Washington, D.C., where she focused on economic policy. She has seven years of investment experience and holds an MBA from Harvard Business School. She received her undergraduate degree from Brown University.

## **Ignacio Galaz, CFA**

Mr. Galaz is a vice president and account manager in the New York office, focusing on client servicing for public institutions. He is also responsible for leading PIMCO's minority broker outreach program to provide opportunities to small minority- and women-owned business enterprises. He joined PIMCO in 2000 and worked most recently as a senior associate in account management in New York and previously as a trading assistant on the short-term bond desk in Newport Beach. He has 11 years of investment experience and holds an MBA from the MIT Sloan School of Management and an undergraduate degree from Chapman University. In 2009 he received a Toigo fellowship, which is awarded to MBA candidates who demonstrate leadership within the finance industry.

## **Ryan Korinke, CFA**

Mr. Korinke is a senior vice president and product manager in the Newport Beach office, focused on absolute return fixed-income strategies. He initially served as an account manager with institutional client servicing responsibility and as the product manager for the Total Return strategy. Prior to joining PIMCO in 2005, Mr. Korinke was with The Concord Group, a real estate investment advisory firm. He has 10 years of investment experience and holds an MBA from the Marshall School of Business at the University of Southern California. He received an undergraduate degree from Harvard University.

# Biographies

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## **Josh Thimons**

Mr. Thimons is an executive vice president and portfolio manager in the Newport Beach office, focusing on interest rate derivatives. Prior to joining PIMCO in 2010, he was a managing director for the Royal Bank of Scotland, where he managed an interest rate proprietary trading group in Chicago. Previously, he was a senior vice president in portfolio management for Citadel Investment Group, focusing on interest rate and volatility trading. Prior to this, he was a director for Merrill Lynch Capital Services, managing an over-the-counter interest rate options market making desk. He has 14 years of investment experience and holds an undergraduate degree and an MBA from the Wharton School of the University of Pennsylvania.

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# PIMCO snapshot

## History

- Founded in 1971
- Investment solutions include fixed income, active equities, alternatives and asset allocation
- Assets under management: \$1.77 trillion
  - \$1.41 trillion in third-party client assets

## People

<b>Employees</b>	<b>2,066</b>
▪ Investment professionals	622
▪ Technical and support	1,444
<b>Highly experienced</b>	<b>Avg Yrs Experience at PIMCO</b>
▪ All investment professionals	13
▪ Senior professionals	19

## Global presence

Offices	IPs
Amsterdam	1
Hong Kong	13
London	99
Milan	1
Munich	62
New York	89
Newport Beach	305
Singapore	11
Sydney	10
Tokyo	21
Toronto	7
Zurich	3



As of 31 March 2012  
SOURCE: PIMCO

Effective 31 March 2012, PIMCO began reporting the assets managed on behalf of its parent's affiliated companies as part of its assets under management



# PIMCO alternative strategies overview

<b>Hedge fund AUM</b>	<ul style="list-style-type: none"><li>▪ \$7.6 billion</li></ul>
<b>Opportunistic/Distressed funds cumulative committed capital</b>	<ul style="list-style-type: none"><li>▪ \$13.0 billion</li></ul>
<b>Investment styles</b>	<ul style="list-style-type: none"><li>▪ Global macro</li><li>▪ Fixed income relative value</li><li>▪ Credit relative value</li><li>▪ Bank loans</li><li>▪ Distressed mortgage</li><li>▪ Distressed credit</li><li>▪ Multi-asset RV and volatility arbitrage</li></ul>
<b>Platform advantages</b>	<ul style="list-style-type: none"><li>▪ Over 70 investment professionals globally contributing to alternatives management</li><li>▪ Large institutional investor base of stable capital across strategies</li><li>▪ Dedicated analytics and risk management professionals</li><li>▪ Institutional quality client servicing and reporting</li><li>▪ Fund terms generally more attractive</li></ul>
<b>Global trading offices</b>	<ul style="list-style-type: none"><li>▪ Newport Beach</li><li>▪ New York</li><li>▪ London</li><li>▪ Munich</li><li>▪ Singapore</li><li>▪ Tokyo</li><li>▪ Sydney</li></ul>

As of 30 June 2012  
Refer to Appendix for additional risk information.

# Pennsylvania Public School Employees Retirement System relationship summary

As of 30 June 2012

Account name	Strategy	Portfolio manager	Inception date	Since inception absolute performance (%) <sup>1</sup>	Since inception alpha (%) <sup>1</sup>	Correlation to equities <sup>2</sup>	Correlation to fixed income <sup>2</sup>	Market value
<b>PIMCO Global Credit Opportunity Fund (GCOF)</b>	Credit Relative Value Hedge Fund	Dan Ivascyn	2/29/08	9.88	9.14	0.22	0.06	\$ 231,703,908
<b>PIMCO Absolute Return Strategy Fund V (PARS)</b>	Global Macro Hedge Fund	Qi Wang	2/29/08	18.10	17.36	0.35	0.41	\$ 227,136,982
<b>PIMCO Multi-Sector Strategy Fund</b>	Tactical Asset Allocation - PSERS Fixed Income Policy Benchmark	Curtis Mewbourne	6/30/12	N/A	N/A	N/A	N/A	\$ 750,343,434
<b>U.S. Core Plus<sup>3</sup></b>	Fixed Income - CorePLUS	Saumil Parikh	4/27/87	8.30	1.08	0.18	0.94	N/A
								\$1,209,184,324

Summary is based on Pennsylvania Public School Employees Retirement System's current portfolio.

<sup>1</sup> All performance shown in Net of Fees. Performance Since Inception annualized.

<sup>2</sup> Equities are represented by the S&P 500 Index. Fixed income is represented by the U.S. Barclays Aggregate Index. Correlation data for GCOF and PARS is from 31 October 2006 to 30 June 2012. Correlation data for CorePLUS is from 30 April 1987 to 31 May 2012.

<sup>3</sup> Performance as of 31 May 2012 (portfolio transitioned into the PIMCO Multi-Sector Strategy Fund)  
Refer to Appendix for additional performance and fee, correlation, index, and risk information.

# PIMCO Multi-Asset Volatility Fund (MAV) overview

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- **What is the Multi-Asset Volatility Fund?**

- A volatility fund launched in July 2011 designed to generate positive returns with low correlations to other asset classes
- MAV is designed to generate alpha by **1)** taking advantage of structural mispricings of volatility risk premiums, **2)** exploiting tactical trading opportunities across global volatility markets, and **3)** providing downside mitigation through active tail risk hedging

- **Investment objectives**

- Produce 10–15% per annum returns (net of fees) with equivalent annual volatility

- **Why now?**

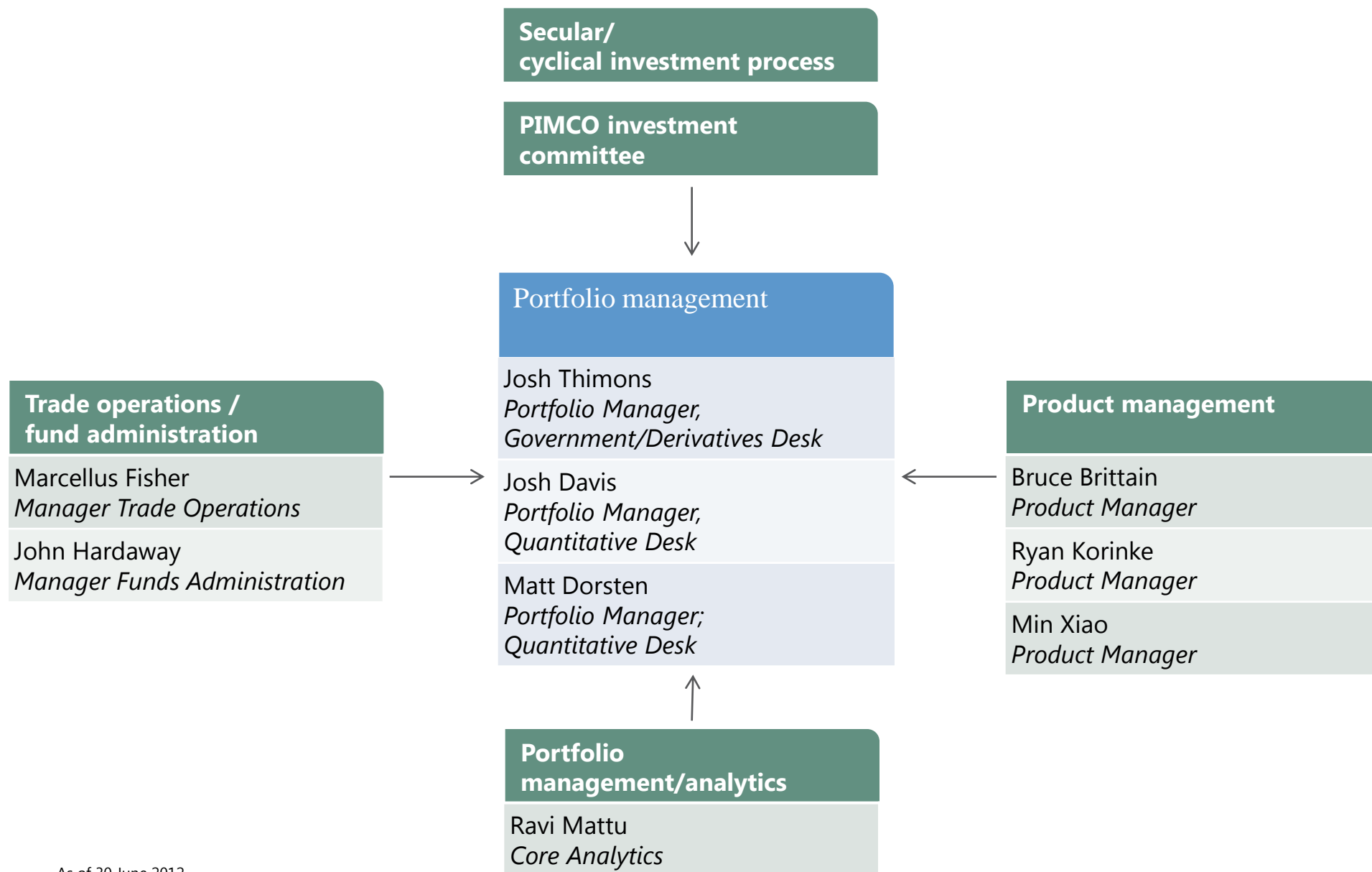
- Financial institutions are deleveraging, reducing proprietary trading activity
- Extreme market volatility offers compelling opportunities within volatility space
- Excess returns are being squeezed from more vanilla and competitive alternative strategies

- **Why PIMCO?**

- Track record for applying global macroeconomic insights to investment strategies and understanding cross-market correlations
- Quantitative understanding of derivative markets coupled with a common-sense approach to tail and downside risk management
- Strong proprietary analytics adapted to exploit opportunities in this opportunity set
- Robust operational platform

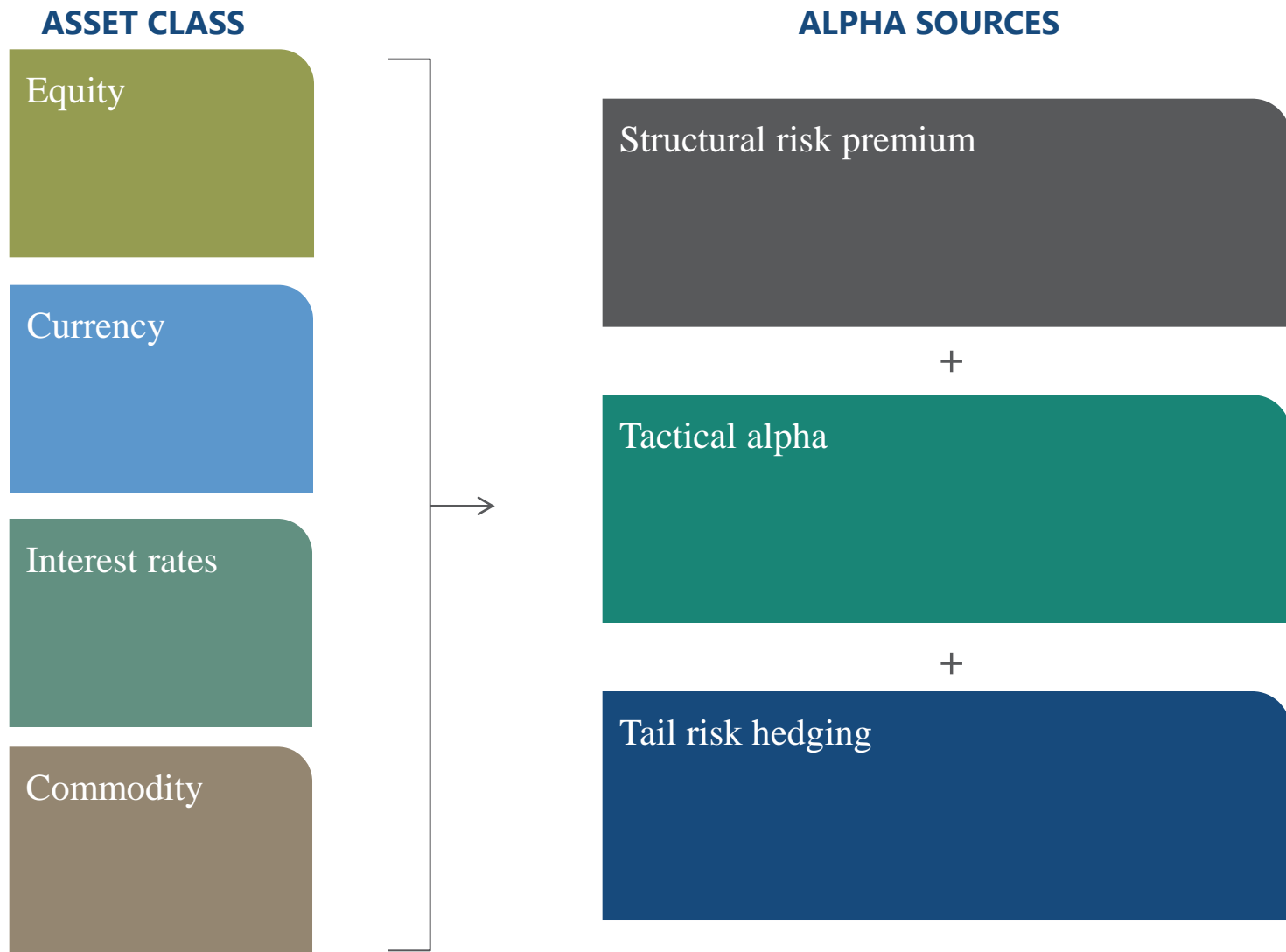
Refer to Appendix for additional investment strategy, risk, and target return information.

# The portfolio management team and support from firmwide resources



As of 30 June 2012

# How does MAV work?



Refer to Appendix for additional investment strategy and risk information.

# Structural risk premium trade example: Treasury auction

## Rationale:

- Because of the large size of Treasury issuance, the supply/demand imbalance in Treasuries during auction cycles has been high
- Yields tend to rise in the period before Treasury issuance and tend to fall during the period following Treasury issuance
- The Dutch Auction process favors Treasury buyers, as the clearing level is the highest yield at which the Treasury has cumulative bids to cover the desired issuance size
- Because primary dealers have reduced balance sheets and proprietary desks have been eliminated, the competition for this type of strategy is generally reduced
- The strategy may profit from providing liquidity to the market during the auction cycle

## Implementation:

- Use a combination of long and short Treasury positions around the auction cycles to profit from the structural anomalies.
- For example: sell 1 unit of duration before the auction, buy 2 units in the auction (when yields are typically higher), and sell 1 unit after the auction.
- Backtests have indicated a sharpe ratio of approximately 3.0 when implemented across Treasury maturities<sup>3</sup>.

As of 31 August 2011

SOURCE: PIMCO, Bloomberg

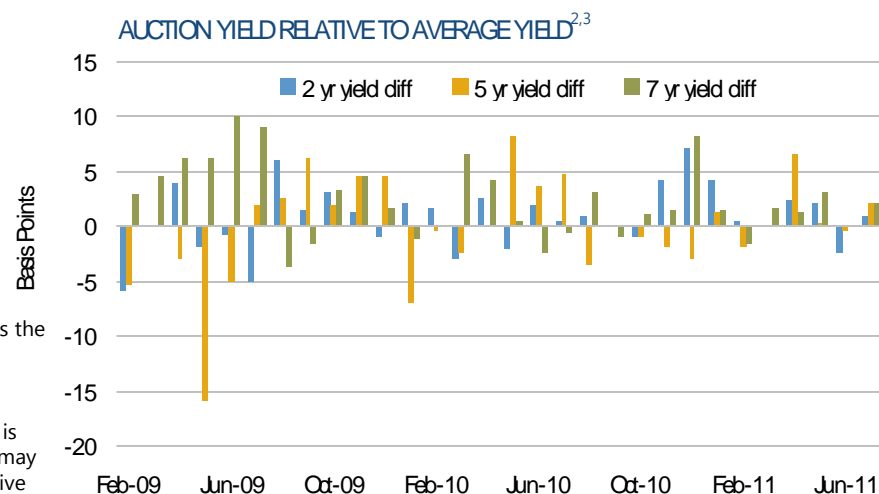
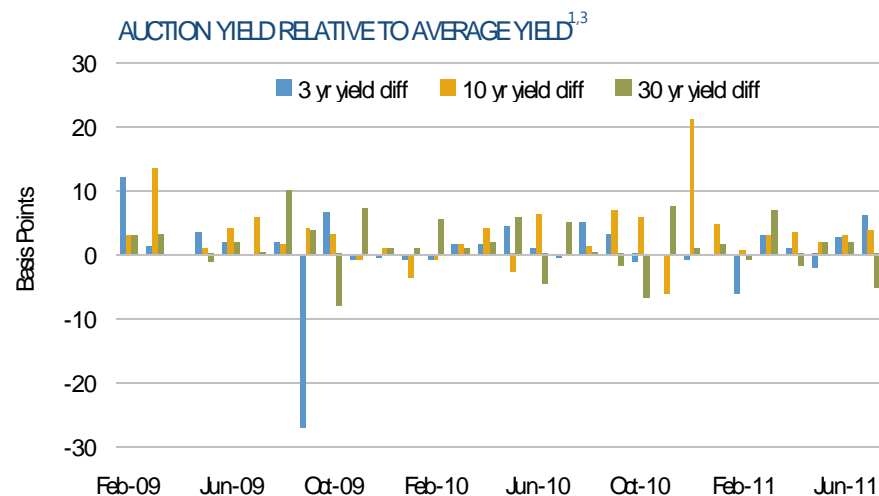
**The trade example above is shown as a sample strategy for illustrative purposes only.** 2008 is the starting period to show the beginning of the deleveraging cycle.

<sup>1</sup> Data analyzed based on 28 auctions for 3yr, 10yr, 30yr treasuries from February 2008–July 2011

<sup>2</sup> Data analyzed based on 29 auctions for 2yr, 5yr, 7yr treasuries from February 2008–July 2011

<sup>3</sup> The difference between the auction yield and the average treasuries yields (2, 3, 5, 7, 10, and 30yr) is shown as a **hypothetical example for illustrative purposes only**. This mathematical calculation may be higher or lower than the actual figure. The sharpe ratio includes the average auction yield relative to the average treasuries yield (2, 3, 5, 7, 10, and 30yr) from February 2008–July 2011. No representation is being made that any account, product, or strategy will or is likely to achieve profits or results similar to those shown.

Refer to Appendix for additional hypothetical example, investment strategy, and risk information.



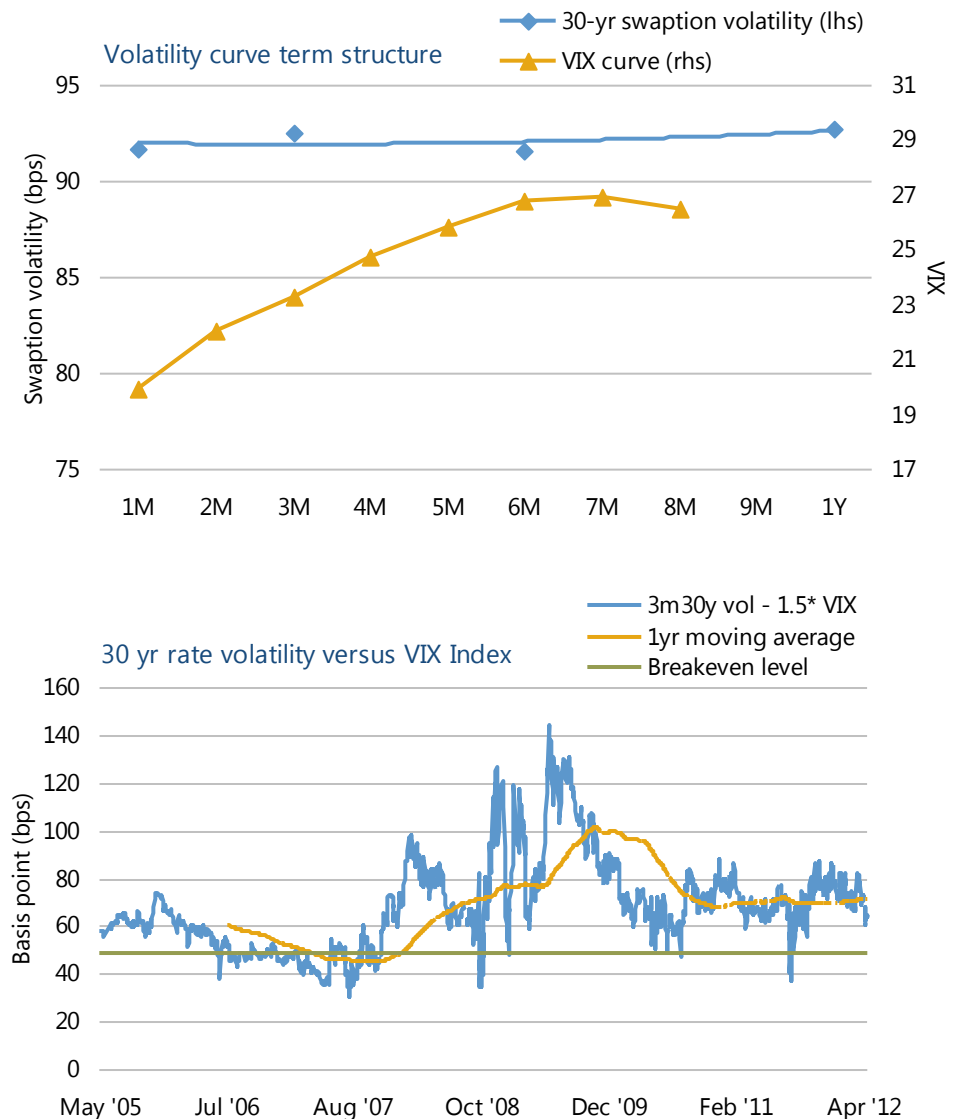
# Tactical alpha trade example: Cross assets volatility

## Rationale:

- Equity volatility curve is steep driven by high demand from left tail hedging activities
- By contrast, the volatility term structure of the 30yr swaption market is flat – forward 30yr swaption volatility is relatively cheap
- The difference comes from different supply/demand dynamics in equity and interest rate volatility markets
- In a deflationary scenario when the yield curve flattens, 30yr volatility tends to provide equity-like downside risk, similar to equity volatility. In addition, 30yr volatility also typically provides right-tail hedging in an inflationary scenario when yield curve steepen dramatically.

## Implementation:

- Sell futures (Sep 2012 maturity) on the S&P 500 volatility Index (VIX)
- Buy forwards (Sep 2012 maturity) on U.S. 30yr interest rate volatility



As of 18 April 2012  
 SOURCE: PIMCO, Bloomberg  
**Sample for illustrative purposes only**  
 Refer to Appendix for additional investment strategy and risk information

# Tail-risk hedging trade examples

Objective: Long volatility positions allocated to areas where volatility are attractively priced

DATE	HEDGE DESCRIPTION	POTENTIAL EVENT	CONTRACT / TERMS	COST	OUTCOME
<b>August 2011</b>	Currency	Sharp selloff in equities: AUD Weakens	3m AUD / USD Put	26 bps	Closed in September with 2X payoff
<b>August 2011</b>	Rate	Growth surprises to the upside: a hedge to an optimistic scenario	8m/7y USD Payer Swaption, struck at 3.5%	62 bps	Expired out of money
<b>August 2011</b>	Rate	Back-end curve volatility increases; demand for back-end duration increases during financial repression	3m/30y USD Receiver Swaption, struck at 2.75%, 2.5%, 2.25%	55 bps 44 bps 52 bps	Closed in October with 1.8X to 2.8X payoff
<b>September 2011</b>	Equity	A significant rise in equities, given the short bias strategy and short equity beta in the FX strategy stemming from D+ positioning	6m SPX Call	25 bps	Closed with 6 bps gain and switched to cheaper currency option
<b>November 2011</b>	Equity	Sharp selloff in equities	2m, 4m SPX index, Financial ETF, REIT deep OTM put spread	60 bps	Expired out of money
<b>January 2012</b>	Equity Currency	Right tail hedge	6m SPX, Nikkei, Eurostoxx call spread, BRL, AUD call spread	50 bps	Still open
<b>January 2012</b>	Commodity	A worsening macro scenario: oil demand dampens	Heating oil September put vs. crude oil September put	Costless	Still open
<b>March 2012</b>	Rate	Left tail hedge	3m/30y USD Receiver 3m call on 30y Treasury	50 bps	Active monetization and re- striking, 5X payoff

As of 30 June 2012  
SOURCE: PIMCO

<sup>1</sup> Example Tail Risk Hedges are indicative of all types of instruments used in the PIMCO's Multi-Asset Volatility Strategy. Cost shown is for illustrative purposes only and current premium or hedge cost may be more or less than the cost shown. There may be additional costs involved in management and hedging portfolios that are not included in the information shown above. Refer to Appendix for additional investment strategy and risk information



# MAV portfolio risk distribution

*No single theme or position dominates our strategy*

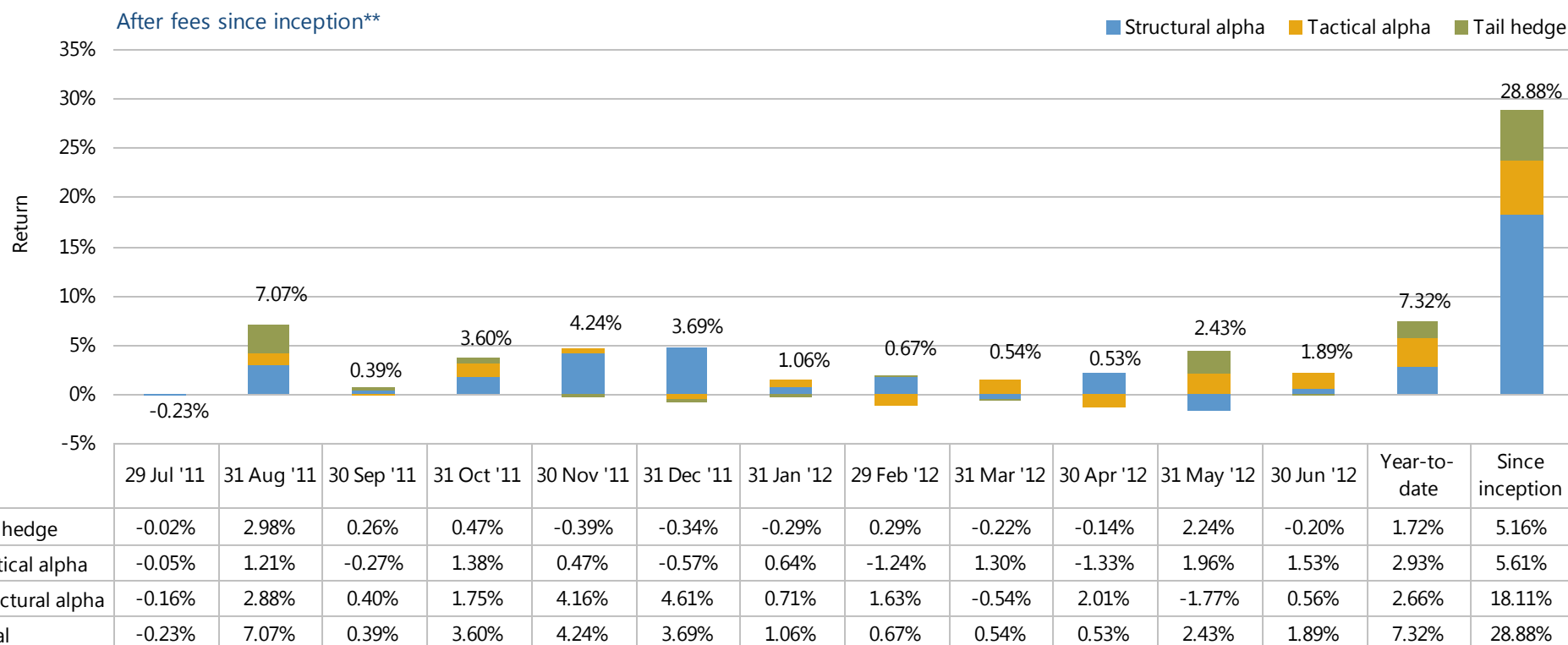
PORTFOLIO COMPONENTS		EXPECTED SOURCES OF ADDED VALUE (% OF TOTAL)	EXPECTED RISK CONTRIBUTION (% OF TOTAL)
Structural alpha strategies	Equity	15–25%	15–25%
	Currency	15–25%	15–25%
	Interest rate	15–25%	15–25%
	Commodity	15–25%	15–25%
Tactical alpha strategies		25–50%	25–50%
Tail risk hedging strategies		0% net	
<b>Total</b>		<b>100%</b>	<b>100%</b>

As of 30 June 2012  
Refer to Appendix for additional investment strategy and risk information.

# MAV Fund performance attribution by strategy

As of 30 June 2012

CORRELATIONS*	
Market Indices	MAV
Barclays U.S. Aggregate Index	0.31
S&P 500 Index	-0.09
MSCI World Index	-0.16
HFRX Global Hedge Fund Index	-0.46
DJ UBS Commodity Index	0.13



Performance reflects the 1<sup>st</sup> series investment (Master Fund schedule)

\* Based on monthly returns (after fees) data from 31 July 2011; based on standard MAV fee schedule (Master Fund)

\*\* Inception date: 15 Jul '11

Refer to Appendix for additional performance and fee, attribution analysis, correlation, index, investment strategy, and risk information.

# PSERS PIMCO hedge fund allocation with MAV

## Key takeaways

An allocation to MAV could potentially:

- Increase returns
- Lower volatility
- Decrease sensitivity to broad market movements (equity and fixed income)

Correlations of select PIMCO hedge funds  
As of 30 June 2012<sup>1</sup>

	PARS V	GCOF	MAV <sup>3</sup>
PARS V	1.00		
GCOF	0.40	1.00	
MAV	0.37	0.15	1.00

As of 30 June 2012

\$mm	Current allocation	Scenario 1 (+\$200mm additional)
PARS V	230	220
GCOF	230	220
MAV	0	220

%	Current allocation	Scenario 1 (+\$200mm additional)
PARS V	50%	33.3%
GCOF	50%	33.3%
MAV	0%	33.3%

Summary stats NET <sup>1</sup> returns	Current allocation	Scenario 1 (+\$200mm additional)
Annualized return	12.1%	14.0%
Annualized vol (monthly returns)	9.1%	7.1%
Correlation SPX	0.366	0.312
Correlation BCAG	0.368	0.357

<sup>1</sup> Assuming current fee schedule.

<sup>2</sup> Correlation is based on monthly after fee returns from 31 Oct 2006 to 30 Jun 2012.

<sup>3</sup> Prior to the inception MAV (15 July 2011), the returns were based on the MAV structural model portfolio. The model performance is shown as hypothetical example for illustrative purposes only. Additional model performance can be found on page 18.

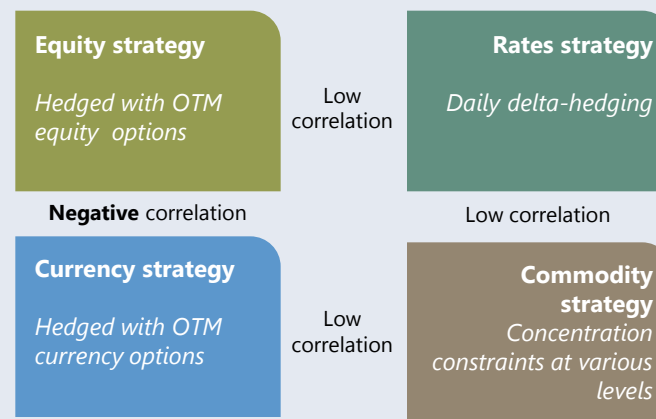
Refer to Appendix for additional performance and fee, correlation, hypothetical example, investment strategy, model, and risk information.

Additional information

# Risk management – looking to protect against sharp spikes in volatility

1. The strategy maintains an internal diversity (i.e. low correlation) across the structural strategies
  - Each structural strategy is sized based on a fixed volatility target
  - Each structural strategy has specific risk control guidelines

## STRUCTURAL ALPHA STRATEGIES



2. Tactical alpha trades tend to benefit from rising volatility or rising correlations, providing a performance cushion in stress environments
  - Each tactical strategy has an explicit profit target and stop loss

## TACTICAL ALPHA STRATEGIES

3. The strategy focuses to make a strategic allocation to a “long volatility” tail risk hedging strategy that uses attractively priced options across multiple markets in effort to protect against outsized market moves
  - At least 300 bps premium budget per annum

## MACRO TAIL RISK HEDGING

Refer to Appendix for additional investment strategy and risk information.

# MAV structural model portfolio performance

- Backtest results for crisis and full periods
  - Both showed high return with limited volatility

MODELS: July 2007 - May 2009 Crisis	Combined structural	Equity structural	Fx structural	Rates structural	Commodity structural
Mean return <sup>1</sup>	23.43%	9.61%	-1.13%	5.30%	9.65%
Volatility	10.27%	5.21%	4.33%	4.69%	5.81%
Max drawdown	-6.75%	-4.22%	-6.30%	-3.87%	-3.97%

MODELS: April 2003 - June 2011	Combined structural	Equity structural	Fx structural	Rates structural	Commodity structural
Mean return <sup>1</sup>	23.42%	3.79%	5.43%	7.38%	6.83%
Volatility	9.14%	5.42%	4.40%	4.15%	6.08%
Max drawdown	-6.75%	-11.20%	-7.70%	-3.87%	-9.97%

- Correlations
  - Low correlation with broad equity market
  - Low correlation with broad interest rate market
  - Negative correlation between equity and fx strategies

## Correlations

MODELS: April 2003 - June 2011	Fx structural	Rates structural	Commodity structural	Combined structural	SPX	U.S. 10yr rate
Equity structural	<b>-0.33</b>	-0.09	0.07	0.44	-0.62	-0.07
FX structural		0.15	-0.18	0.23	0.39	0.03
Rates structural			0.00	0.47	0.23	-0.04
Commodity structural				0.62	-0.04	0.04
Combined structural <sup>2</sup>					<b>-0.10</b>	<b>-0.02</b>

SOURCE: PIMCO

**Hypothetical example for illustrative purposes only**

<sup>1</sup> No fees and/or expenses were included in the back test model performance

<sup>2</sup> Equally weighted combination of the four strategies (equity, rate, fx and commodity)

Refer to Appendix for additional correlation, hypothetical example, index, model and risk information.

# Appendix

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The presentation is intended only for Pennsylvania Public School Employees Retirement System use. If you are not the named addressee, you should not disseminate, distribute, alter or copy this report. This report is provided for information purposes and should not be construed as a solicitation or offer to buy or sell any securities or related financial instruments in any jurisdiction.

## **PERFORMANCE AND FEE**

**Past performance is not a guarantee or a reliable indicator of future results.** The Fund experienced high performance for one or more periods. No assurance is being made that this favorable market activity will be repeated. The Fund's fees are discussed within the Private Placement Memorandum (PPM) and definitive Legal documents.

## **Attribution**

Attribution is calculated by separating the overall fund returns into the structural and discretionary categories for the various sectors invested in by the Fund. The attribution also accounts for the impact of tail risk hedging on the overall returns of the fund. Structural investments refer to the model driven, rule based strategies across equity, currency, rates and commodities. Tail Risk Hedging refer to the opportunistic long volatility trades which have a up-front cost and expect to have multiple times of payoff during tail events, Discretionary investments refer to the other relative value trades across volatility surfaces.

The attribution analysis contained herein is calculated by PIMCO and is intended to provide an estimate as to which elements of a strategy contributed (positively or negatively) to a portfolios performance. Attribution analysis is not a precise measure and should not be relied upon for investment decisions.

## **CORRELATION**

The correlation of various indices or securities against one another or against inflation is based upon data over a certain time period. These correlations may vary substantially in the future or over different time periods that can result in greater volatility.

## **HYPOTHETICAL EXAMPLE**

No representation is being made that any account, product, or strategy will or is likely to achieve profits, losses, or results similar to those shown. Hypothetical or simulated performance results have several inherent limitations. Unlike an actual performance record, simulated results do not represent actual performance and are generally prepared with the benefit of hindsight. There are frequently sharp differences between simulated performance results and the actual results subsequently achieved by any particular account, product, or strategy. In addition, since trades have not actually been executed, simulated results cannot account for the impact of certain market risks such as lack of liquidity. There are numerous other factors related to the markets in general or the implementation of any specific investment strategy, which cannot be fully accounted for in the preparation of simulated results and all of which can adversely affect actual results.

## **INVESTMENT STRATEGY**

There is no guarantee that these investment strategies will work under all market conditions or are suitable for all investors and each investor should evaluate their ability to invest long-term, especially during periods of downturn in the market.

## **MODEL**

Equity structural strategy: The model implements: 1) shorting 1 month SPX index put option; 2) shorting 1 month underlying SPX index futures with explicit tail risk hedging instruments using equity out of the money options; and 3) targeted implied volatility of 5%.

FX structural strategy : The model is based on 1) the 3x3 Naïve Portfolio + Dynamic leverage +tail hedges model portfolio -please see below for additional information; and 2) targeted implied volatility of 5%.

Interest Rate structural strategy : The model implements: 1) selling short-dated straddles on interest rates in USD, GBP, and EUR; 2) targeted implied volatility of 5%.

Commodity structural strategy : The model implements: 1) buying and selling a basket of commodity futures across precious metal, agriculture and energy sectors; 2) maximize roll yield subject to diversification constraints; and 3) targeted implied volatility of 5%.

Combined structural: The model is an equally weighted combination of the four strategies listed above (Equity, Rate, FX and Commodity).

# Appendix

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Naïve 3x3 Portfolio: A G-10 (Australia, Canada, Switzerland, Europe, U.K., Japan, Norway, New Zealand, Sweden, U.S.) carry portfolio (model) which consists of an equally weighted basket of the three highest yielding currency (long position) and three lowest yielding currency (short position). The carry model exploits the forward rate bias, and attempts to profit from the observation that exchange rate movements are not accurately predicted by interest rate differentials. The model returns does not include any fees or expenses.

Naïve 3x3 Portfolio + Dynamic Leverage: A G-10 (Australia, Canada, Switzerland, Europe, U.K., Japan, Norway, New Zealand, Sweden, U.S.) carry portfolio (model) which consists of an equally weighted basket of the three highest yielding currency (long position) and three lowest yielding currency (short position) and adjusts portfolio leverage based upon market volatility. The carry model exploits the forward rate bias, and attempts to profit from the observation that exchange rate movements are not accurately predicted by interest rate differentials. The model returns does not include any fees or expenses.

3x3 Naïve Portfolio + Dynamic Leverage + Tail Risk Hedging: A G-10 (Australia, Canada, Switzerland, Europe, U.K., Japan, Norway, New Zealand, Sweden, U.S.) carry portfolio (model) which consists of an equally weighted basket of the three highest yielding currency (long position) and three lowest yielding currency (short position) and adjusts portfolio leverage based upon market volatility. The carry model exploits the forward rate bias, and attempts to profit from the observation that exchange rate movements are not accurately predicted by interest rate differentials. The model returns does not include any fees or expenses. The tail risk hedging strategies in the model involve the use currency options. The FX Strategies may use other derivative instruments as part of its risk hedging techniques.

## **RETURN TARGET**

PIMCO believes the targeted return set forth above is reasonable based on a combination of factors, including the Fund's investment team's general experience and assessment of prevailing market conditions and investment opportunities. There are, however, numerous investment-specific assumptions that factor into the targeted return that may not be consistent with future market conditions and that may significantly affect actual investment results. Such assumptions include, but are not limited to, (i) PIMCO's ability to adequately assess the risk and return potential of investments through its bottom-up research; (ii) availability of suitable relative value opportunities in each asset; and (iii) various measurements and parameters relating to PIMCO's expected outlook for certain global and local economies and markets.

The targeted return set forth above is not a prediction or projection of actual investment results and there can be no assurance that any targeted return for an investment or, in the aggregate, for the Fund, will be achieved. Investors should also be aware that a relatively high targeted return, such as that set forth above, entails concomitantly greater risks of adverse investment results. The targeted return set forth above is an aggregate target and is based on the targeted returns that PIMCO intends to use as selection criteria in connection with the evaluation of individual investments for the Fund. The target return of any individual investment is intended to be commensurate with the assessed degree of risk and can be lower or higher, depending on the nature of any individual investment. PIMCO's evaluation of a proposed investment for the Fund will be, in turn, based on PIMCO's internal analysis and evaluation of the investment and on numerous investment-specific assumptions that may not be consistent with future market conditions and that may significantly affect actual investment results. No representation or warranty is made as to the reasonableness of the assumptions made or that all assumptions used in calculating the target return have been stated or fully considered. The Fund's ability to achieve investment results consistent, in the aggregate, with the targeted return set forth above depends significantly on a number of factors in addition to the accuracy of such assumptions. These factors include the Fund's ability to identify a sufficient number and mix of suitable investments to achieve full investment consistent with the Fund's asset allocation criteria and investment strategy, and the Fund's overall ability to execute its investment strategy successfully. Each of these is subject to the potential risks summarized below. In any event, the past performance of previous investments made by PIMCO is not necessarily indicative of future performance and there can be no assurance that PIMCO will succeed in identifying a sufficient number and mix of investments consistent with the targeted return objective set forth above or the Fund's investment philosophy, investment strategy and current investment allocation targets. Such targets may be adjusted in light of available opportunities or changing market conditions.

## **RISK**

All investments contain risk and may lose value. The Fund is not subject to the same regulatory requirements as mutual funds. The Fund may be, and is expected to be, leveraged and may engage in speculative investment practices that may increase the risk of investment loss. The Fund's performance can be volatile; an investor could lose all or a substantial amount of their investment. The Fund manager has broad trading authority over the Fund. The use of a single adviser applying generally similar trading programs could mean lack of diversification and, consequently, higher risk. There is no secondary market for the investor's interest and none is expected to develop. There are restrictions on transferring interests in the Fund and it has limited liquidity provisions. The Fund's high fees and expenses may offset the Fund's trading profits. A substantial portion of the trades executed for the Fund are in non-U.S. securities and take place on non-U.S. exchanges. The Fund may invest in non-publicly traded securities which may be subject to illiquidity risk. The Fund is not required provide periodic pricing or valuation information to investors. The Fund involves complex tax structures and there may be delays in distributing important tax information.



# Appendix

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Tail risk hedging may involve entering into financial derivatives that are expected to increase in value during the occurrence of tail events. Investing in a tail event instrument could lose all or a portion of its value even in a period of severe market stress. A tail event is unpredictable; therefore, investments in instruments tied to the occurrence of a tail event are speculative.

Investing in the bond market is subject to certain risks including market, interest-rate, issuer, credit, and inflation risk; investments may be worth more or less than the original cost when redeemed. Investing in foreign denominated and/or domiciled securities may involve heightened risk due to currency fluctuations, and economic and political risks, which may be enhanced in emerging markets. Mortgage and asset-backed securities may be sensitive to changes in interest rates, subject to early repayment risk, and while generally supported by a government, government-agency or private guarantor there is no assurance that the guarantor will meet its obligations. High-yield, lower-rated, securities involve greater risk than higher-rated securities; portfolios that invest in them may be subject to greater levels of credit and liquidity risk than portfolios that do not. Commodities contain heightened risk including market, political, regulatory, and natural conditions, and may not be suitable for all investors. Equities may decline in value due to both real and perceived general market, economic, and industry conditions. Currency rates may fluctuate significantly over short periods of time and may reduce the returns of a portfolio. Derivatives and commodity-linked derivatives may involve certain costs and risks such as liquidity, interest rate, market, credit, management and the risk that a position could not be closed when most advantageous. Commodity-linked derivative instruments may involve additional costs and risks such as changes in commodity index volatility or factors affecting a particular industry or commodity, such as drought, floods, weather, livestock disease, embargoes, tariffs and international economic, political and regulatory developments. Investing in derivatives could lose more than the amount invested. Swaps are a type of derivative; while some swaps trade through a clearinghouse there is generally no central exchange or market for swap transactions and therefore they tend to be less liquid than exchange-traded instruments.

A purchase of these interests involves a high degree of risk that each prospective investor must carefully consider prior to making such an investment. Investors should thoroughly review the Investment Considerations and Risk Factors section of the Offering Memorandum for a more complete description of these risks. Prospective investors are advised that investment in the Funds are suitable only for persons of adequate financial means who have no need for liquidity with respect to their investment and who can bear the economic risk, including the possible complete loss, of their investment.

This material contains the current opinions of the manager and such opinions are subject to change without notice. This material has been distributed for informational purposes only and should not be considered as investment advice or a recommendation of any particular security, strategy or investment product. Information contained herein has been obtained from sources believed to be reliable, but not guaranteed. No part of this material may be reproduced in any form, or referred to in any other publication, without express written permission. ©2012, PIMCO.

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## **ADDITIONAL FUND INFORMATION**

structural volatility strategy: The structural volatility strategy is generally expected to generate returns by implicitly or explicitly selling volatility on multiple asset classes, including equities, currencies, interest rates, and commodities.

## **INDEX DESCRIPTION**

The Barclays U.S. Aggregate Index represents securities that are SEC-registered, taxable, and dollar denominated. The index covers the U.S. investment grade fixed rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities. These major sectors are subdivided into more specific indices that are calculated and reported on a regular basis.

The Dow Jones UBS Commodity Total Return Index is an unmanaged index composed of futures contracts on 20 physical commodities. The index is designed to be a highly liquid and diversified benchmark for commodities as an asset class. Prior to May 7, 2009, this index was known as the Dow Jones AIG Commodity Total Return Index.

HFRX Global Hedge Fund Index is an unmanaged index designed to be representative of the overall composition of the hedge fund universe. It is comprised of all eligible hedge fund strategies; including but not limited to convertible arbitrage, distressed securities, equity hedge, equity market neutral, event driven, macro, merger arbitrage, and relative value arbitrage. The strategies are asset weighted based on the distribution of assets in the hedge fund industry.

# Appendix

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The MSCI World Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets. The MSCI World Index consists of the following 24 developed market country indices: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

The S&P 500 Index is an unmanaged market index generally considered representative of the stock market as a whole. The index focuses on the Large-Cap segment of the U.S. equities market.

It is not possible to invest directly in an unmanaged index.



## Absolute Return Program Allocation

# PIMCO Multi-Asset Volatility (MAV) Offshore Fund Ltd.

July 26, 2012

Robert E. Little, CPA  
Portfolio Manager, External Public Markets

# PIMCO Multi-Asset Volatility Offshore Fund Ltd.

## **Overview of PIMCO**

- Founded in 1971
- Owned by Allianz SE (a global financial services company)
- Manages assets of approximately \$1.77 trillion

## **Investment Team**

- Over 2,000 employees worldwide
- Over 600 investment professionals worldwide
  - MAV has a team of 3 dedicated portfolio managers (one of the portfolio managers, Josh Thimons, sits on PIMCO's 11-member Investment Committee and Regional Committee)

# PIMCO Multi-Asset Volatility Offshore Fund Ltd.

## **Fund Strategy**

- Utilize market volatility to generate positive returns that have low correlations with other asset class returns
- Generate positive returns through –
  - Volatility premiums from systematic volatility trading
  - Opportunistic relative value trading
  - Tail risk hedging

# PIMCO Multi-Asset Volatility Offshore Fund Ltd.

## **Value Proposition**

- The strategy has access to PIMCO's worldwide investment resources
- Adding MAV to our existing PARS/GCOF portfolio would have increased the portfolio return, lowered the portfolio volatility, and reduced the portfolio's correlation to the S&P 500 Index and Barclays Capital Aggregate Index
- Adding MAV to our existing PARS/GCOF portfolio will allow PSERS to benefit from a netting arrangement when calculating the performance fee for the combined portfolio

# PIMCO Multi-Asset Volatility Offshore Fund Ltd.

## Performance (through 06/30/2012)

	2011	2012	Inception to Date
MAV, net of fees	20.08%	7.32%	28.88%

The return data is net of the standard MAV fee schedule.

Inception date: July 15, 2011

# PIMCO Multi-Asset Volatility Offshore Fund Ltd.

## Absolute Return Program Objectives

- Enhance the return/risk profile of the overall program
  - Annualized Return and Volatility of MAV since 07/01/2011
    - Annualized Return: 28.88%
    - Standard Deviation: 7.43%
    - Sharpe Ratio: 3.88
- Invest in uncorrelated return streams
  - Historical correlation to PIMCO PARS/GCOF portfolio: -0.50
  - Historical correlation to PSERS' largest absolute return managers:
    - AQR Offshore Multi-Strategy: -0.38
    - BlackRock Global Alpha: -0.46
    - Bridgewater Pure Alpha: 0.35
    - Brigade Leveraged Capital Structures: -0.45
  - Low historical correlations with major equity, fixed income, and commodity indices (see Appendix)

## Portfolio Use

- Staff intends to invest \$220 million in the PIMCO Multi-Asset Volatility Offshore Fund Ltd. and include this investment in the Absolute Return Program.
  - \$200 million in new capital
  - \$20 million from our existing PARS/GCOF investments



# PIMCO Multi-Asset Volatility Offshore Fund Ltd.

## Other

- Relationship with Aksia: None
- Placement Agents: None
- Political Contributions in PA: None
- Introduction Source: Staff
- History with PSERS: PIMCO has managed money for PSERS since 1987

# PIMCO Multi-Asset Volatility Offshore Fund Ltd.

## Recommendation

Staff, together with Aksia LLC, recommends (i) that the Board invest \$220 million in the PIMCO Multi-Asset Volatility Offshore Fund Ltd., and (ii) that the Investment Office shall have the discretion to invest additional sums within the target ranges approved by the Board in Exhibit D of the Investment Policy Statement, Objectives and Guidelines, as amended from time to time provided that any investment of an additional sum by the Investment Office shall be reported to the Board in a timely manner.

**DISCLAIMER:** This document was presented to the Public School Employees' Retirement Board at the public meeting at which the Board acted on the resolution to which the information relates. The sole purpose for posting the presentation information on this website is to enable the public to have access to documents that were utilized at a public meeting of the Public School Employees' Retirement Board, and no other purpose or use is intended.

# Appendix - Correlations

Correlation (as of 06/2012)	MAV	MSCI AC World Index IMI	DJ UBS Commodity	Barclays Aggregate	Barclays Global Aggregate
MAV	1.00				
MSCI AC World Index IMI	-0.16	1.00			
DJ UBS Commodity	0.14	0.69	1.00		
Barclays Aggregate	0.13	0.15	0.07	1.00	
Barclays Global Aggregate	0.05	0.49	0.46	0.73	1.00