Investment Program

ABSOLUTE RETURN

Joint Investment Committee

Summary: FY 2019-2020 Work Plan

<u>Q1/Q2: Implementing new Strategic Asset Allocation</u>

Initial implementation using passive exposure in two stages

- Stage 1: August month-end **(P&F),** October month-end **(Fed)**
- ~~Stage 2: October month-end or December month-end~~
- **Phase in before December month end (P&F), Nov month end (Fed)**

<u>Q2/Q3: FI and AR</u>

Restructuring Short Term IG from T-Bills to 1-3 Year Gov / Credit

- Initial implementation of passive exposure ~~ASAP~~
- **Early Oct (P&F), Nov month end (Fed)**
- Selection of structure and possible active managers: Q2 / Q3

~~Restructuring Absolute Return into an Alternative Risk Premia focused allocation~~

Re-underwrite Absolute Return Program

<u>Q3/Q4: Additional Items</u>

Re-underwrite BlueBay EM Select

Re-underwrite Credit Suisse Risk Parity Commodities

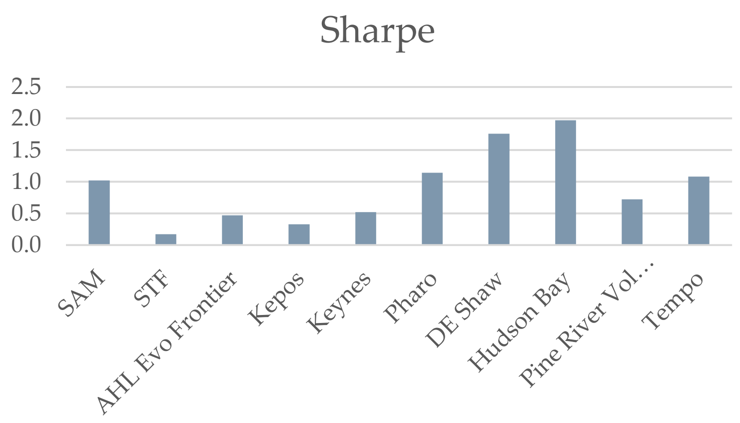
Review and consolidate passive exposures across Public Equities and Fixed Income

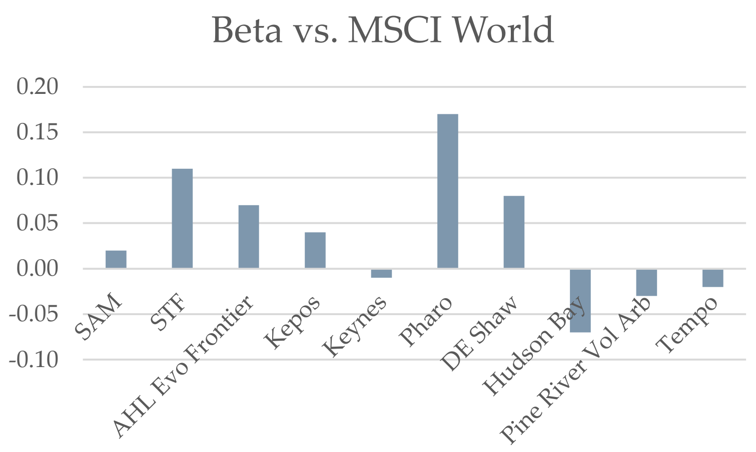
Current Program

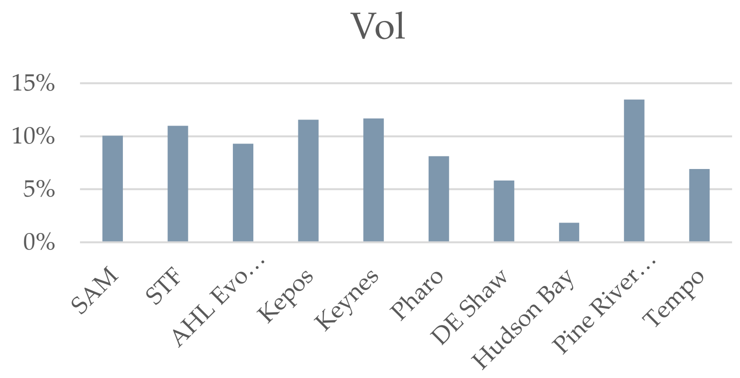
Combination of Macro and Relative Value strategies.

<u>Macro</u>
Systematic Trend: STF, SAM, AHL Frontier
Systematic Trend plus: Keynes, Kepos
Discretionary: Pharo

<u>Relative Value</u>
DE Shaw
Hudson Bay
Vol Pine River Vol Arb
Tempo







	allocation size	data period
SAM	2%	10/15 - 8/19
STF	5%	9/16 - 8/19
AHL Evo Frontier	7%	3/15 - 8/19
Kepos	9%	11/10 - 8/19
Keynes	8%	9/05 - 8/19
Pharo	14%	5/05 - 8/19
DE Shaw	20%	3/01 - 8/19
Hudson Bay	16%	9/16 - 8/19
Pine River Vol Arb	10%	1/11 - 8/19
Tempo	9%	6/08 - 8/19

Albourne, Staff

Considerations and Alternatives

Correlation to Growth Asset Classes
Return, Vol objective

Costs
- Management and Incentive Fees
- Consultant costs
- Staff resources

Likely increases to INCF allocation needed

Flexibility

Default:
- Maintain the current program.

Alternatives:
- Smaller program that winds down over time
- Alternative Risk Premia
- Fund of funds

Smaller Program

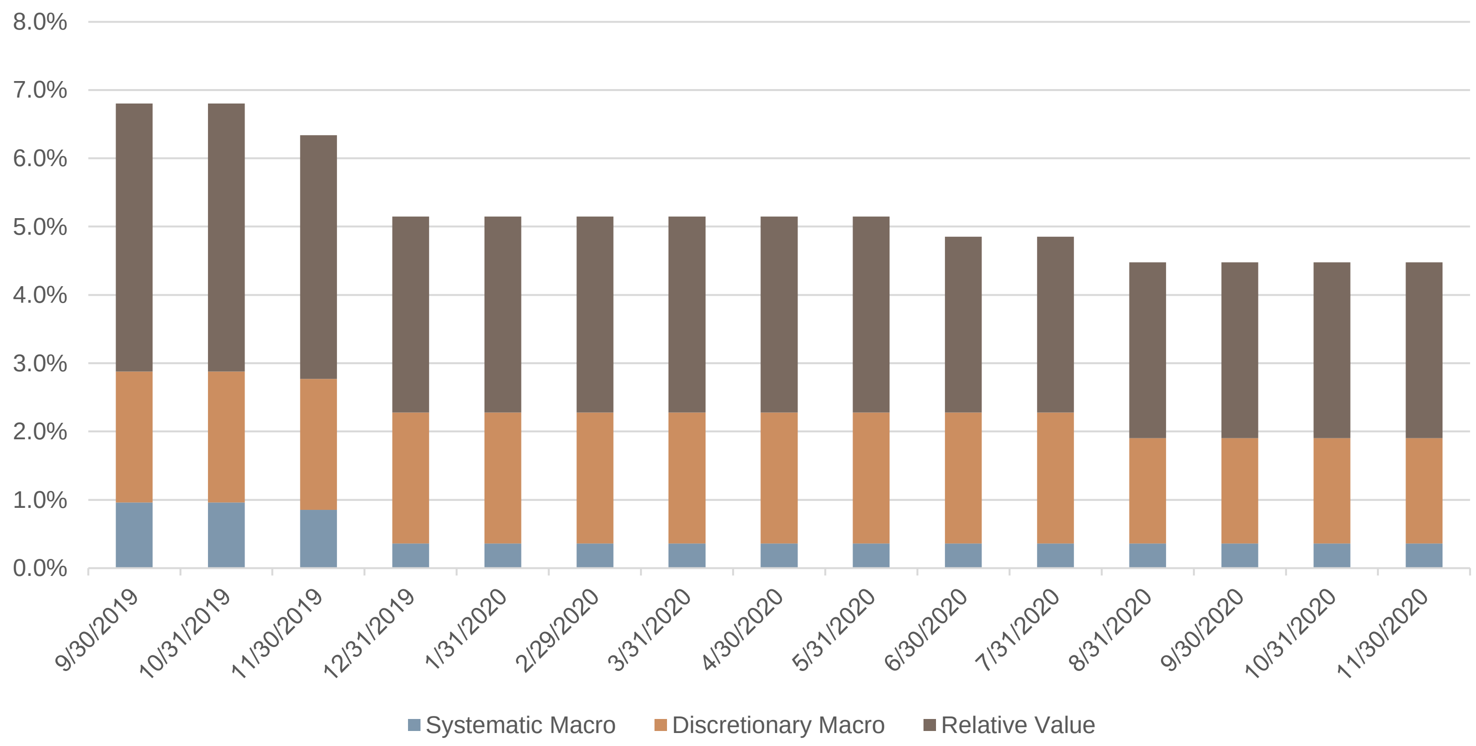
Maintains current low correlation to Growth Asset Classes, with similar ex-ante return and volatility profile.

Management fees will decline as hedge fund assets drop. Management fees as a percentage of hedge fund assets may fluctuate as mix of cost structures changes.

Consultant costs may change as relationship with Absolute Return consultant is renegotiated.

Shrinking program (as a percentage of plan) allows for growth of INCF allocation within an overall stable Low Beta allocation.

Avoiding a wholesale change in philosophy and approach preserves flexibility should the program decide to re-evaluate a new approach to absolute return.



Appendix – INCF Changes

The Immunized Net Cash Flow (INCF) allocation sits alongside Absolute Return in the "Low Beta" functional group.

The INCF allocation will likely require an increasing portion of the plan to hedge its targeted 5-year term.

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INCF Balances, con't

P&F	REPLENISHMENT NEEDED TO DEFEASE 5 YRS		
	$	YEARS	% PLAN
2020	44,803,017	5.0	5.0%
2021	64,243,873	5.0	5.7%
2022	99,818,932	5.0	6.4%
2023	201,936,099	5.0	8.3%
2024	345,073,233	5.0	10.4%
2025	433,269,276	5.0	11.5%
2026	109,795,456	5.0	5.5%
2027	647,368,318	5.0	14.0%
2028	750,988,044	5.0	14.0%
2029	822,461,539	5.0	13.7%
2030	883,660,847	5.0	14.3%
2031	988,520,645	5.0	14.8%
2032	1,098,261,774	5.0	15.2%
2033	1,211,579,435	5.0	15.8%
2034	1,336,429,157	5.0	16.0%

If the Plans keep the hedging term at 5 years, the amount of plan required rises substantially, as well as the annual replenishment amounts, using current projections.

Fed	REPLENISHMENT NEEDED TO DEFEASE 5 YRS		
	$	YEARS	% PLAN
2020	23,598,114	5.0	4.7%
2021	29,451,366	5.0	5.2%
2022	45,678,559	5.0	5.7%
2023	63,359,257	5.0	6.1%
2024	79,779,653	5.0	6.4%
2025	95,465,412	5.0	6.6%
2026	109,795,456	5.0	6.8%
2027	121,831,651	5.0	6.9%
2028	138,494,098	5.0	7.1%
2029	151,238,078	5.0	7.1%
2030	169,675,878	5.0	7.3%
2031	200,136,965	5.0	7.7%
2032	220,218,858	5.0	7.8%
2033	232,288,833	5.0	7.6%
2034	269,424,125	5.0	8.1%

Staff, Q1 2019

Appendix – Strategy Snapshots

<u>GROWTH</u>

Public Equity

- None

Emerging Markets Debt

- Iguazu
  - This multi-PM long/short strategy operates within EM. Includes fundamental and systematic strategies across both external and local debt, rates and currencies.
  - Pros: very strong risk adjusted returns.
  - Cons: can have low beta to EMD benchmarks.

<u>LOW BETA</u>

Absolute Return: Systematic Macro

- Kepos Alpha Fund
  - Long / Short quantitative strategy that uses many models grouped into three general types of strategies: Macro Statistical Arbitrage, Volatility Trading, and Systematic Event Driven. Each strategy includes models that trade within and across asset classes; very short horizon, with turnover ranging from intraday to 2-weeks.
  - Pros: provides exposure to very short horizon momentum in markets. Very low correlation to equities; realized 0.0 to MSCI ACWI over past decade.
  - Cons: can be difficult attribute performance to an underlying economic rationale. Very short horizon. Strategy is in a continual academic and informational arms race against similar quantitative strategies. The underlying fund is liquid, but both Plans are in the Class B share class, which has a rolling 2-year soft lock.
  - Outlook: while difficult at times to forecast the opportunity set, in general this is a strategy that should perform well if market volatilities rise. Model development and the firm’s ongoing investment into research and technical resources should be an ongoing point of monitoring.

Appendix – Strategy Snapshots, con't

- Keynes Leveraged Quantitative Strategy
  - Long / Short quantitative strategy that uses a blend of trend and non-trend models across asset classes. The models can be grouped into Trend, Non-Trend Directional, and Non-Trend Relative Value. Best considered as trend exposure with a discretionary component. Managed by an established, very well credentialed PM.
  - Pros: discretionary changes to equity delta have added value relative to pure trend strategies. PM provides insight into central bank driven markets, given prior experience.
  - Cons: firm was recently purchased by PGIM, and is beginning a larger marketing push to the US institutional community. The strategy will have to add new models to increase capacity.
  - Outlook: AUM growth will have to be monitored, as well as possible changes to the PM's responsibilities.

Absolute Return: Global Macro

- Pharo Management
  - Global macro strategy that is largely EM focused. Organized as a multi-PM team, with capital and risk concentrated at the top. The team trades FX, sovereign debt, credit, local market rates and commodities in a risk controlled manner.
  - Pros: fund has strict risk limits by position and time for each PM, enforced by a non-trading partner. High degree of diversification across PMs in combination with robust risk monitoring results in a portfolio with consistently positive returns.
  - Cons: opportunity set for global macro strategies may be muted, given a return to QE and quasi-coordinated central bank easing. Relatively expensive.
  - Outlook: Consistent, well performing strategy in a mature firm, but perhaps limited by opportunity. Standard ongoing concerns: key man risk, adherence to capital allocation policies, etc.

Absolute Return: Trend Following

- Systematica Trend Following
  - Basic trend strategy. Operates in liquid markets, uses standardized set of trend models. This is essentially the "commoditized" version of the CTA space, trend "beta."
  - Pros: cheap. Standard models operating in liquid markets.
  - Cons: perhaps too basic. "Smarter" CTA models may trade against standard trend strategies, eating into expected returns.
  - Outlook: strategy provides exposure to trend at a low, fixed rate. Separating out "cheap" trend can reduce the overall cost of a larger CTA program, but at smaller capital sizes, can be unnecessarily complex.

Appendix – Strategy Snapshots, con't

- Systematica Alternative Markets
  - Trend following strategy that operates in moderately liquid environments; similar models to STF, but applied to less liquid markets.
  - Pros: fills in the space between very liquid markets (STF) and very illiquid markets (Evolution Frontier)
  - Cons: requires operational expertise in obscure markets.
  - Outlook: strategy is useful as one component of a larger trend program, but probably not a core holding on its own.
- AHL Partners Evolution Frontier
  - Trend following strategy focused on extremely illiquid but tradable markets. Applies trend models from AHL Evolution CTA to less liquid securities. Evolution Frontier also holds some exposure to the Evolution strategy, as well as a small holding in Catastrophe Bonds. Tradable markets for Frontier are constantly monitored for liquidity and volume consistency; total market number about 200, across all asset classes.
  - Pros: potential to capture trends returns in markets that are unexploited by competitors.
  - Cons: underlying markets can have large factor commonalities, e.g. oil, that can swamp trend returns. Strategy requires extreme expertise in obscure markets, and operational strength dealing with diverse regulatory requirements.
  - Outlook: strategy is useful as one component of a larger trend program, but probably not a core holding on its own. Strategy must be monitored for constant updating of underlying markets, as well as overlap with larger Evolution strategy.

Absolute Return: Relative Value

- DE Shaw Composite Fund
  - Quantitatively oriented multi-strategy fund.
  - Pros: consistent performer. Well resourced, both technically and academically.
  - Cons: very expensive.
  - Outlook: headliner with regards to hedge fund fees, but this strategy may be the exception that proves the case.
- JD Capital (Tempo)
  - Multi-PM fund that focuses on volatility arbitrage. Typical trades include: index RV, single security spreads, dispersion, and commodity / FX vol.
  - Pros: lead PM is well experienced and a veteran of diverse market environments. Strategy provides exposure to volatility in a diversified manner.
  - Cons: high key man risk. Strategy attempted to diversify into FX vol, but experienced some hiccups with TRL in 2018.

Appendix – Strategy Snapshots, con’t

- Pine River Volatility Arbitrage
  - Single-PM fund that focuses on volatility arbitrage. Typical trades include: index RV, single security spreads, and dispersion.
  - Pros: PM is knowledgeable, and strategy is inexpensively priced.
  - Cons: high key man risk. Portfolio tends to be more concentrated than Tempo, and often times more directional.
- Hudson Bay Capital Arbitrage
  - Single-PM strategy that exploits valuation and technical differences in different parts of the capital structure of single firms. Different components of a given firm’s capital structure may trade differently, given the distinct market participants for different security types. This strategy exploits the valuation and exposure differences that result from these technically driven valuation idiosyncrasies.
  - Pros: lead PM is well experienced. Strategy has a very low correlation to other markets.
  - Cons: opportunity set can be limited. High key man risk.