LORING WARD

2019 ASSET ALLOCATION REVIEW AND MODEL CHANGES

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INTRODUCTION

Academic studies have shown that the choices an investor makes to allocate their money across asset classes constitute the most important stage of their investment decision-making – with potentially more than 90% of the wealth they will earn over their lifetimes resulting primarily from this stage.[1] We at Loring Ward agree with this sentiment.

In pursuit of this belief we devote significant resources to the allocation stage of investment decision-making. At least once a year the Loring Ward investment team revisits, top-to-bottom, all aspects of the asset allocation decision made across all our investment models. We revisit our assumptions, analyses, conclusions and recommendations for all our models. In this white paper we present the results of our annual review conducted during early 2019.

Our Core Beliefs

Before reviewing our process and the updates we generated in our 2019 review, we offer a reminder of our core beliefs about what should drive any high-quality investment process. We hold to a set of six core beliefs, covering markets and the individuals who rely upon them, that are the starting axioms for our investment process. These beliefs are:

1. Investments Should be Diversified – Particularly for the average investor who seeks only to grow their wealth to a higher level by retirement but with a degree of confidence in that growth, diversification of their portfolio is, in our opinion, an absolute necessity.

2. Efficient Markets Prevail – There is an immense academic literature on market efficiency and belief in "efficiency" depends strongly on how the concept is defined. For our purposes we define our belief in efficiency very simply: we don't anticipate that an investor can outperform the market by making frequent short-term investment decisions in their portfolio that are driven by publicly available information such as price patterns, company fundamentals, analyst expectations, etc.

3. Allocate by Asset Classes – There are different ways to allocate monies broadly in a portfolio, such as geographically, or by exposures to certain characteristics of the investment instruments used. We believe that allocating across asset classes (and sub-asset classes) offers a simple and effective means of achieving diversification and is one that is easily understood by clients.

4. Factor Premiums Exist – While markets may be efficient (i.e. unbeatable) in the short-run, we believe that maintaining intelligently-chosen overweight and underweight positions (relative to their capitalization weights in the market) to certain market factors over the long-run can be advantageous.

5. Quantitative Tools Are Essential – There are far too many asset classes, market factors and individual investment vehicles in the marketplace for even a sophisticated investor to consider without the assistance of both mathematics and technology. We believe certain quantitative tools, such as mean-variance optimization, have shown the test of time to add value to the investment process. And such tools require the assistance of technology to deploy.

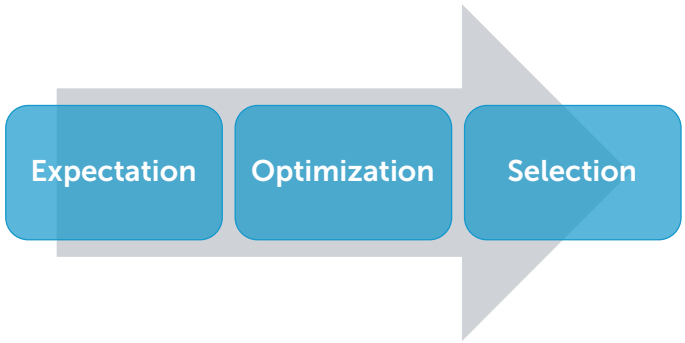
[1] Brinson, Gary P., L. Randolph Hood & Gilbert L. Beebower (1995) Determinants of Portfolio Performance, Financial Analysts Journal, 51:1, 133-138

6. Behavioral Preferences Deserve Consideration – There are a host of behavioral preferences that investors express which deserve to be taken into consideration in portfolio construction. Traditional financial models from academia don't always incorporate these preferences properly, but we believe they deserve respect. For example, some investors want their personal values (e.g. environmental sustainability) incorporated into their portfolios. Other investors might prefer not to be invested entirely outside the United States. We believe that such preferences should, where possible, help inform the creation of client portfolios.

These six beliefs lay the foundation for our investment reasoning. Let us now review the Loring Ward investment process and see how it is influenced and driven by these core beliefs.

ASSET ALLOCATION PROCESS

We arrive at our recommended asset allocations by following a three-stage process that begins with our estimates of asset classes, moves on to finding the "efficient frontier" of portfolios that can be formed by optimally mixing those asset classes, and concludes with the selection of model portfolios from along that efficient frontier. We call these three stages the Expectation Stage, Optimization Stage, and Selection Stage.



Expectation Stage

The first stage of our asset allocation process begins with our development of Capital Market Assumptions (CMAs) that reflect our long-term expectations of return and risk for various asset classes. We develop a robust set of CMAs to feed both our asset allocation process as well as to populate our forward-looking planning tools, such as our Investment Planning Center (IPC), where they are used for planning and portfolio comparison purposes. Our CMA estimates are long-horizon (20 years) in nature and reevaluated annually to ensure they reflect all available information regarding markets that would have an impact on our estimates. A separate white paper[2] that describes our process for developing CMAs and our CMA assumptions for 2019 is available on our website as a companion piece to this discussion.

Once we have created our full set of CMAs, we then select a subset of CMAs for portfolio optimization purposes. The subset is, in effect, the set of asset classes we intend to use for the creation of our Investment Models. We use a subset of CMAs for portfolio optimization purposes for two reasons: the first reason is mathematical – when you submit the return and volatility information on dozens of asset classes into an optimizer, many asset classes move similarly to other asset classes and the optimizer is unable to discriminate properly and gives poor results. Optimizers work better with fewer asset classes.

The second reason is based on one of our six core investment beliefs, i.e., we believe that maintaining intelligently-chosen overweight and underweight positions (relative to their capitalization weights in the market) to certain market factors over the long-run can be advantageous. This influences our decision to submit (or to withhold) certain asset classes from our portfolio construction process. For example, we tend to include Value-oriented asset classes (e.g. Large Cap Value) into our optimizer but we do not include Large Cap Growth as a standalone asset class, since we think Growth stocks offer a negative factor premium over time.

[2] Loring Ward, "Asset Class & Capital Market Assumptions." 2019,
https://advisor.myadvisorcenter.com/sites/default/files/documents/files/asset-class-capital-market-assumptions-methodology.pdf

Finally, we also make certain additional decisions regarding the CMA subset that are also reflective of our belief in factors. For example, we incorporate the CMA asset classes of Small Cap Value, both US and non-US, into our CMA subset, even though we tend to invest in Small Cap Neutral funds. That is reflective of the fact that we know that when we invest in Small Cap Neutral funds, we tend to have a bias towards those Neutral funds that tilt slightly towards value. We make a similar adjustment to our Emerging Markets CMA asset class to incorporate a value tilt, since we tend to invest in Emerging Markets Value funds.

Overall the result of our application of our investment beliefs is that our MVO Subset tends to hold about ten CMA asset classes. The choice of ten CMA asset classes for the MVO Subset is both respective of the needs of the optimization program to process a limited set of asset classes, and is also reflective of our belief in tilting towards asset classes that favor positive factor premiums and leaving out asset classes whose factor returns are either negative or have not shown themselves to be sufficiently positive over the long-term.

Optimization Stage

The second stage of our asset allocation process loads our CMA estimates into a portfolio optimization program – specifically a program designed to perform what is known as Mean-Variance Optimization (MVO)—to set asset allocation policy. MVO, as introduced by Markowitz[3,4] , is a common approach used in practice by professional investment managers to develop and set asset allocation policy. The important insights gained through Markowitz's optimization process won him a Nobel Prize in 1990.

Markowitz recognized that whenever the returns of two assets are not perfectly correlated, they can be combined to form a portfolio that has less risk than the weighted-average risk of the individual assets themselves – indeed, this is the basic reason why diversification is beneficial. He also recognized that as one adds assets to a portfolio, one should focus on those assets' effect on the riskiness of the entire portfolio, not on the riskiness of those additional assets themselves.

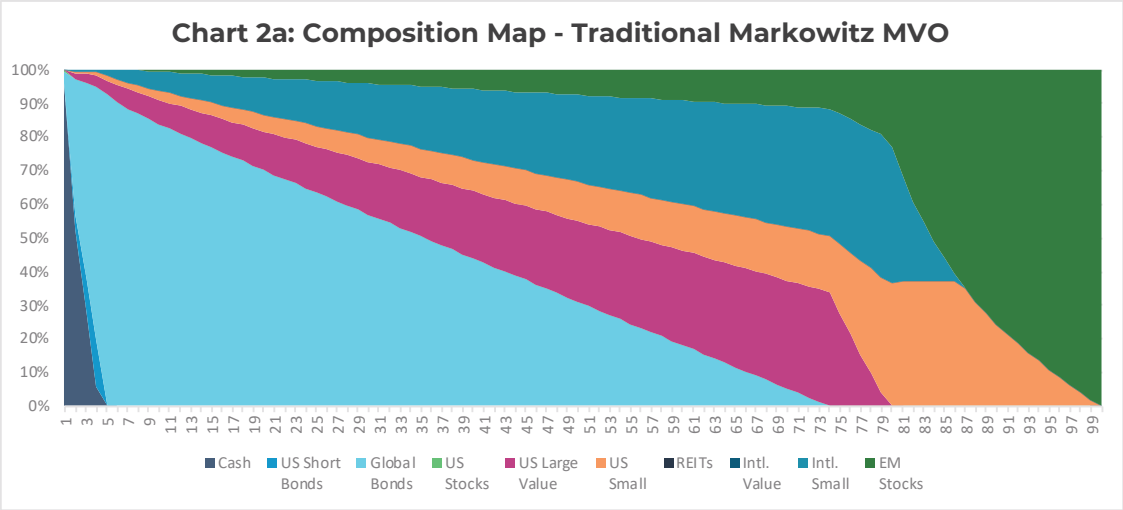
MVO provides a framework for us to use to determine how much to allocate to each asset class to maximize the expected return of each portfolio for the expected level of risk. We emphasize the word "expected" because the inputs to MVO are forward-looking estimates (our CMAs), and the resulting portfolios reflect the quality of our inputs.

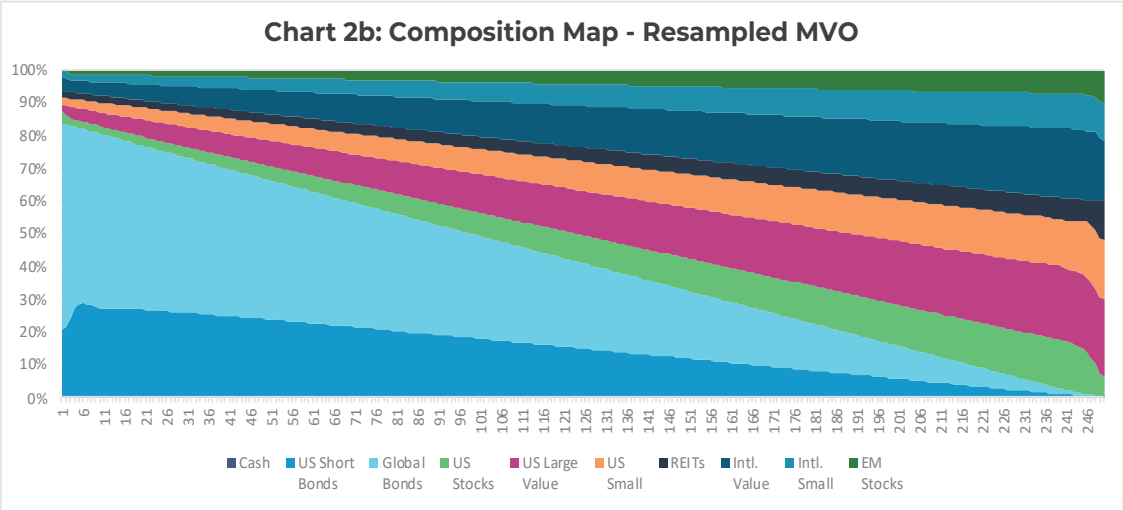
To mitigate errors in our estimates, we use a special style of MVO known as Resampled Mean—Variance Optimization (Resampled MVO), which combines Markowitz's MVO framework with Monte Carlo simulation to build an optimized portfolio that helps to minimize the fact that our CMAs inputs are imprecise and subject to error.

Conceptually, Resampled MVO is a large-scale sensitivity analysis where we use thousands of portfolio variations on baseline capital market assumptions to create an equal number of optimized frontiers based on the Monte Carlo–generated assumptions. These intermediate frontiers are referred to as simulated frontiers. The resulting asset allocations from these simulated frontiers are saved and averaged to draw one final "Resampled Frontier."

The improvement from using Resampled MVO can be dramatic. Resampled MVO results in much smoother transitions between portfolios as you transition across the resampled efficient frontier. It also helps avoid the known propensity of simple MVO to create large or concentrated positions within a portfolio. Charts 2a and 2b each show what is called a "Composition Map." The Composition Map shows how portfolio weights change as you move across the efficient frontier. Chart 2a shows the transitioning for an ordinary MVO, while Chart 2b show the transitioning for a Resampled MVO.

[3] Markowitz, Harry M. 1952. "Portfolio Selection." Journal of Finance, vol. 7, no. 1 (March): 77–91.
[4] Markowitz, Harry M. 1959. Portfolio Selection: Efficient Diversification of Investments. New York: John Wiley & Sons.





It is clear from the charts above that the transitioning with Resampled MVO is smoother than for traditional MVO. This is important for clients because if they choose to move to a different location along the efficient frontier (as can often happen when clients experience important life changes, such as retirement), the changes to their portfolio will likely not be as drastic, minimizing transaction costs and possibly tax impact.

We also bring to bear our own proprietary incorporation of behavioral considerations into the optimization stage. These behavioral considerations, which will be discussed in more detail below, take the form of portfolio constraints that we directly incorporate into our MVO program.

As with our CMAs, we review this MVO methodology, including the constraint sets and how they are impacted by any changes to our CMAs, annually. The end-result of our optimization stage each year is a set of allocations across various asset classes that define the broad holding levels in all our investment models. These sets of allocations may differ from current model levels and if so, the new allocation weights will be implemented.

Selection Stage

The final stage of our investment process is the selection of specific investment vehicles to provide exposure to the asset classes chosen during the optimization stage. The selection process is a mix of considering both third-party investment managers and the mutual funds they have available in the asset classes used in our model portfolios. Loring Ward has a detailed set of proprietary procedures for the due diligence process applied to the managers and mutual funds we consider for use in our model portfolios. When considering the manager, we evaluate their organization, their people, and their investment philosophy. When considering investments, we evaluate their investment performance, asset levels and growth, and consistency with our portfolio needs.

OUR 2019 ASSET ALLOCATION RECOMMENDATIONS

Our 2019 review of our investment process was conducted during the first quarter of 2019. As a result of this review, certain changes were made at every stage of our investment process: in our CMA estimates, in our MVO allocations, and in some of our mutual fund selections. In this section we first review our existing models and weights, then highlight the changes resulting from our 2019 review, provide an analysis of those changes for client portfolios, and finally draw a series of conclusions about these changes for 2019. A series of appendices follow which provide additional detail and certain nuanced results.

Our Current Investment Models

Driven by the core beliefs and investment process described above, Loring Ward makes available a series of investment models. From the perspective of asset class allocation, most of the current investment models apply the same weighting approach to create seven levels of risk exposure. Table 1 below specifies the weights that prevailed in our investment models prior to the 2019 changes.

TABLE 1: LORING WARD 2018 INVESTMENT MODEL ALLOCATIONS

Asset Class	Defensive	Conservative	Balanced	Moderate	Moderate Growth	Capital Appreciation	Equity
Cash & Cash Alternatives	4%	3%	3%	2%	2%	2%	2%
U.S. Short Investment Grade Bonds	35%	28%	23%	16%	11%	6%	0%
Global Short Bonds	36%	29%	24%	17%	12%	7%	0%
U.S. Stocks	5%	10%	12%	15%	18%	21%	23%
U.S. Large Value Stocks	5%	7%	9%	12%	14%	15%	18%
U.S. Small Neutral Stocks	3%	5%	6%	8%	9%	10%	12%
U.S. REITs	3%	3%	3%	4%	5%	5%	6%
International Large Value Stocks	7%	9%	11%	14%	15%	18%	21%
International Small Neutral Stocks	2%	4%	5%	7%	8%	9%	10%
Emerging Markets Stocks	0%	2%	4%	5%	6%	7%	8%
TOTAL EQUITY	25%	40%	50%	65%	75%	85%	98%
TOTAL CASH/FIXED INCOME	75%	60%	50%	35%	25%	15%	2%
TOTAL PORTFOLIO	100%	100%	100%	100%	100%	100%	100%

Table 1 provides the baseline weights for Loring Ward's Global Portfolio Series. Certain sets of specialty investment models that apply different weights and/or select different mutual funds than the Global Portfolio Series are discussed in Appendix B and C. Also, Loring Ward makes available, at client request, a series of non-optimized "tilted" versions of the Global Portfolio Series, which are discussed in Appendix D.

The 2019 Updates to the Investment Models

As a result of our 2019 review, the investment team at Loring Ward has in fact made updates to all its investment models for 2019. These updates were driven by three categories of change identified during our annual review: changes to the CMA estimates, changes to the MVO behavioral constraints and changes to the mutual funds used in the models. We discuss each of these changes in turn below.

CMA Changes

In reviewing its Capital Market Assumptions, the investment team of Loring Ward made a series of changes to the estimates. Only one change was made to the CMA Expected Returns – for the Cash asset class, the long-term Expected Return estimate was raised from 2.00% to 2.50%. Additionally, small changes across all asset classes were made in the estimates of Expected Volatility and Correlation due to our use of an EWMA process for these estimators.[5] The Volatility changes were generally in the range of -0.66% to +0.38%, with the median Volatility

[4] Loring Ward estimates its Volatility and Correlation CMAs using Exponentially Weighted Moving Average (EWMA) techniques. EWMA differs from traditional estimation in that it gives more weight to recent observations and less weight to older observations.

estimate being 13.44% for comparison purposes. Similarly, the changes in the CMA Correlation estimates from 2018 to 2019 ranged from -6.3% to +5.4%, against a median 2019 Correlation estimate of 49.5% for comparison purposes. As mentioned earlier in this white paper, a detailed paper explaining the Loring Ward CMA Estimation Process (including 2019 updates and an explanation of the EWMA methodology) is available on the Loring Ward website.

In addition to the changes to the CMA estimates themselves, one other difference in the investment process for 2019 was related not to the CMA estimates themselves, but to how the CMA estimates were used in the MVO stage. In the past, the Loring Ward investment team used the CMA estimates for U.S. Small Cap, International Small Cap and Emerging Markets to drive our Resampled MVO process (among other asset classes). In 2019 the investment team decided to instead use the value-tilted versions of these asset classes (i.e. U.S. Small Cap Value, International Small Cap Value and Emerging Markets Value, respectively) to represent our exposures in those asset class categories. The reasoning behind this decision is that the mutual funds we use in our investment models to represent Small Cap and Emerging Markets tend to exclude growth stocks and have more of a value orientation, hence the decision was made that the value-oriented CMA estimates for those asset classes would be used instead of using the "neutral" (or "core") asset classes. The impact of these changes will be discussed below.

MVO Constraint Changes

In 2019, the Loring Ward investment team continued to use the same optimization approach as has been used in prior annual updates – a Resampled Mean Variance Optimization program, fed by the most current Loring Ward CMA estimates available.[6] What changed for 2019 were some of the behavioral constraints used within the optimization process.

Loring Ward applies constraints within its Resampled MVO analysis in order to manifest certain behavioral restrictions we believe would be in the best interests of clients. For example, Loring Ward limits non-US equity exposure to be 40% of overall equity exposure. This constraint was not changed for 2019. Another behavioral constraint unchanged for 2019 was the limitation that U.S. Large Cap Value exposure could be no more than 40% of total U.S. equity exposure. In both cases these constraints express a belief that clients would not be comfortable with equity portfolios comprised either largely of just international stocks, or a US equity portfolio comprised primarily of large cap value stocks.

Other behavioral constraints applied in the past were changed in 2019. The broadest set of changes was that Loring Ward decided to remove all its "individual" constraints and leave in place only "relative" constraints. Individual constraints put hard numerical caps on individual asset classes, such as a constraint that REITs be no more than 10% of the overall portfolio. In our experience we have found that individual constraints tend to only be binding on our all-equity portfolios and not on any of our other portfolios. We have found that wherever there might be a need for an individual asset class cap, it is more easily expressed within our relative constraint structure. Relative constraints are like the one mentioned above, where one asset class is limited to be a fraction of a subset of the other asset classes (e.g. US Large Value 40% of US equity exposure).

Table 2 below shows our relative constraints for 2019, in contrast to those we considered in 2018. We made several changes in 2019, such as allowing (albeit only if the optimizer considered it a good idea) more exposure in Emerging Markets, in REITs, in Global Bonds, and in U.S. Small Cap. In general, the team felt that the portfolios would benefit from fewer restrictions and more influence from the CMA estimates.

[6] Loring Ward uses the Asset Allocation module within Morningstar Direct to conduct its MVO analysis. This program allows the user to do either "standard" MVO (also called "Markowitz" MVO), which is a non-resampled approach, or Resampled MVO. While the team produces a standard MVO for comparison purposes, final allocations are determined using the Resampled MVO approach. Generally, the team sets the program to run 2,000 samples that yield 250 points along the resampled efficient frontier. Final results are obtained by rounding down to a one decimal place level of precision for the model allocation weights.

TABLE 2: BEHAVIORAL CONSTRAINTS APPLIED

Relative Constraint		Constraint Value	
		in 2018	in 2019
$\frac{U.S.\,Equity\ Exposure}{Total\ Equity\ Exposure}$	=	60%	60%
$\frac{Global\ Bond\ Exposure}{Total\ Bond\ Exposure}$		= 50%	£ 75%
$\frac{U.S.\,Large\ Cap\ Value\ Exposure}{Total\ U.S.\,Equity\ Exposure}$	≤	30%	40%
$\frac{U.S.\,Small\ Cap\ Exposure}{Total\ U.S.\,Equity\ Exposure}$	≤	20%	30%
$\frac{Total\ REIT\ Exposure}{Total\ U.S.\,Equity\ Exposure}$	≤	10%	20%
$\frac{Intl.\,Small\ Cap\ Exposure}{Total\ Intl.\,Equity\ Exposure}$	≤	25%	30%
$\frac{Emerging\ Markets\ Exposure}{Total\ Intl.\,Equity\ Exposure}$	≤	15%	25%

Finally, one last change made in the constraints was to reduce the level of cash that the investment models are permitted to hold – depending on the investment model. In general, our goal was to lower the level of cash holding – down to 0.5% in some cases – in order to help minimize "cash drag" during rising markets.

Mutual Fund Changes

Several changes were made to the mutual fund selections in the Loring Ward investment models as a result of the 2019 review. Changes related to the specialty models (Tax-Managed and Personal Value models) are discussed separately in Appendix B and C. In the Global Portfolio Series, Table 3 below lists the substitutions, eliminations and additions that were made to the set of mutual funds to be used going forward.

TABLE 3: 2019 MUTUAL FUND CHANGES IN LORING WARD GLOBAL PORTFOLIO SERIES

New/Changed Fund	Ticker	Action Taken	Reason for Change
DFA US Large Cap Value III	DFUVX	Replaces existing Class I (DFLVX) of the same fund	"Reduces expense ratio from 27 bps to 13 bps (52% reduction)"
DFA Intl. Large Cap Value III	DFVIX	Replaces existing Class I (DFIVX) of the same fund	"Reduces expense ratio from 43 bps to 24 bps (44% reduction)"
DFA Short-Term Extended Quality I	DFEQX	Replaces DFA One-Year Fixed Income I (DFIHX)	New fund pursues more credit opportunities and longer maturity issues
SA US Fixed Income Fund	SAUFX	Expense ratio lowered, duration strategy changed	"Expense ratio lowered by 2 bps. Investment guidelines now allow longer duration."

Some of the changes that were made to the mutual fund selections were in pursuit of lower expense ratio versions of funds currently being used, such as with certain mutual funds representing U.S. Large Cap Value equities and International Value equities. In other cases, changes were made in the Global Portfolio Series to take greater exposure to duration and credit premiums. For the Global Portfolio Series models that use the proprietary SA Funds, both fixed income mutual funds were changed internally to allow for the pursuit of longer duration. Also, changes were previously approved by the SA Funds Board to lower certain expense ratios of the SA Funds.

THE NEW 2019 GPS MODEL WEIGHTS

Table 4 below shows the new asset allocation weights for the Loring Ward Global Portfolio Series investment models.

TABLE 4: 2019 LORING WARD ASSET CLASS ALLOCATIONS FOR GPS INVESTMENT MODELS
(TAMP/STRATEGIST - where indicated)

Asset Class	Defensive (25/75)	Conservative (40/60)	Balanced (50/50)	Moderate (65/35)	Mod. Growth (75/25)	Cap. Apprec. (85/15)	Equity (100/0)
Cash & Cash Alternatives	0.5%/2.0%	0.5%/2.0%	0.5%/2.0%	0.5%/2.0%	0.5%/2.0%	0.5%/2.0%	0.5%/2.0%
U.S. Short IG Bonds	42.0/41.0%	27.5%/27.0%	19.5%/19.0%	13.5%/13.0%	9.5%/9.0%	5.5%/5.0%	0.0%
Global Short Bonds	32.5%/32.0%	32.0%/31.0%	30.0%/29.0%	21.0%/20.0%	15.0%/14.0%	9.0%/8.0%	0.0%
U.S. Stocks	3.0%	6.0%	7.0%	10.0%	12.0%	13.0%	14.0%
U.S. Large Value Stocks	6.0%	9.0%	11.0%	14.0%	16.0%	19.0%	22.0%
U.S. Small Neutral Stocks	4.0%	6.0%	8.0%	10.0%	11.0%	13.0%	16.0%
REITs	2.0%	3.0%	4.0%	5.0%	6.0%	6.0%	7.0%
Intl. Large Value Stocks	7.0%	9.0%	10.0%	13.0%	15.0%	17.0%	20.0%
Intl. Small Neutral Stocks	3.0%	4.0%	5.0%	7.0%	8.0%	9.0%	12.0%
EM Value Stocks	0.0%	3.0%	5.0%	6.0%	7.0%	8.0%	8.5%
Total Equity	25.0%	40.0%	50.0%	65.0%	75.0%	85.0%	99.5%
Total Cash & Fixed Income	75.0%	60.0%	50.0%	35.0%	25.0%	15.0%	0.5%
Total Portfolio	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In the next section we discuss the impact of these changes, overall, on client portfolios.

Analysis of the 2019 Changes

Table 5, below, repeats the format of Table 4 for the 2019 GPS investment models, except it displays the size of the weight change, from 2018 to 2019, rather than the overall level of the allocation, as shown previously in Table 4. This will help us drill down to the nature of how all the individual changes described above to the investment process manifested into changes in the GPS investment models.

TABLE 5: 2019 LORING WARD ASSET CLASS ALLOCATION CHANGES FOR GPS INVESTMENT MODELS

Asset Class	Defensive (25/75)	Conservative (40/60)	Balanced (50/50)	Moderate (65/35)	Mod. Growth (75/25)	Cap. Apprec. (85/15)	Equity (100/0)
Cash & Cash Alternatives	-3.5%	-2.5%	-2.5%	-1.5%	-1.5%	-1.5%	-1.5%
U.S. Short IG Bonds	7.0%	-0.5%	-3.5%	-2.5%	-1.5%	-0.5%	0.0%
Global Short Bonds	-3.5%	3.0%	6.0%	4.0%	3.0%	2.0%	0.0%
U.S. Stocks	-2.0%	-4.0%	-5.0%	-5.0%	-6.0%	-8.0%	-9.0%
U.S. Large Value Stocks	1.0%	2.0%	2.0%	2.0%	2.0%	4.0%	4.0%
U.S. Small Neutral Stocks	1.0%	1.0%	2.0%	2.0%	2.0%	3.0%	4.0%
REITs	-1.0%	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Intl. Large Value Stocks	0.0%	0.0%	-1.0%	-1.0%	0.0%	-1.0%	-1.0%
Intl. Small Neutral Stocks	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%
EM Value Stocks	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	0.5%

We see that overall the changes in the investment process (i.e. CMA changes and changes to the behavioral constraints) led to certain consistent allocation changes across the recommended investment models. These allocation changes for 2019 included:

(1) Cash - Reductions in the cash allocation within the models.[7] As discussed previously, the investment team made this change to reduce the impact of "cash drag" during rising markets.

[7] The actual size of the reduction in the level of cash holding in any Loring Ward investment model is dependent upon the distribution channel through which a client gains exposure to the models. Financial advisors should check with their Regional Director to clarify which cash level is indicated for their client portfolios.

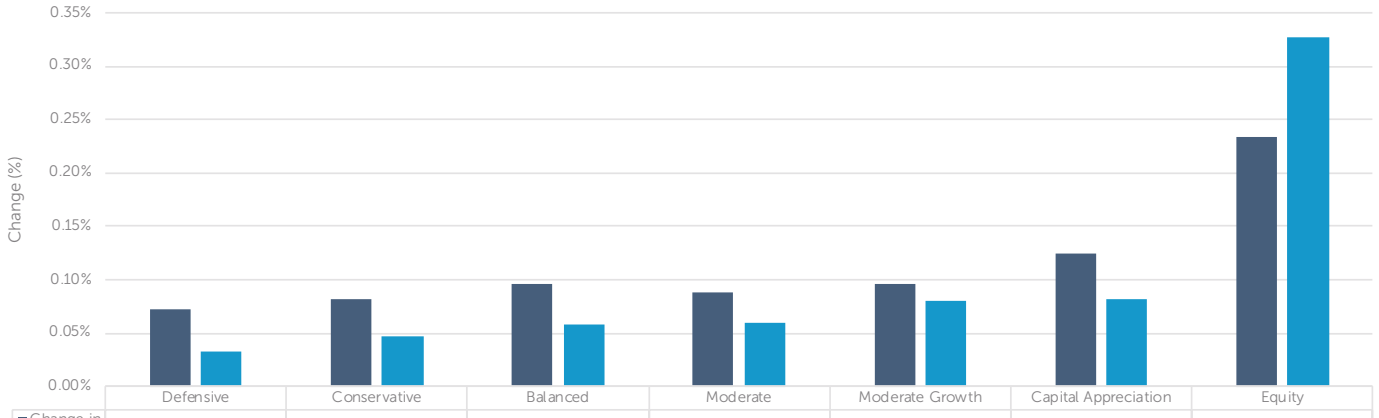
(2) Fixed Income Changes – Generally speaking, the investment models have reduced their exposure to the US fixed income asset class and increased exposure in the global fixed income asset class. Since the global asset class generally takes a longer duration, this has led to an overall increase in duration, with the duration becoming longer (rather than staying constant) as the risk level of the investment models increases. The investment team felt this was appropriate given that the risk tolerance level increases with each investment model, and because we believe the term premium in fixed income markets to generally be positive.

(3) Shift from Core to Factor-Based Equity Classes – Particularly in the U.S. equity asset classes, the 2019 allocations show a move out of U.S. Core Equity and primarily into U.S. Large Value and U.S. Small Neutral. So too in the international equity classes, where a smaller move occurred from International Large Value (which we consider to be the "core" exposure to international equities in our investment models) towards International Small Cap and Emerging Markets Value. These reallocations were driven by two factors: first, the loosening of some of the behavioral constraints in the optimization stage to allow more exposure to factor-based equity asset classes and second, the tilt in the CMAs used in the optimization (in small cap and emerging markets) towards the value-oriented versions of these asset classes.

(4) A Slight Increase in REITs – For most of the risk profiles, REIT exposure was increased by about a percentage point, the result of a loosening in the behavioral constraint for REITs.

In addition to the allocation changes, we can also examine the impact of the model changes in terms of overall Expected Return and Expected Volatility. Consider the results provided below in Chart 3, which shows the degree to which the return and volatility of the seven risk profiles is expected to change as we move the models from their current weights to the 2019 weights:

CHART 3: Changes in Portfolio Risk and Return



	Defensive	Conservative	Balanced	Moderate	Moderate Growth	Capital Appreciation	Equity
Change in Exp. Ret.	0.07%	0.08%	0.10%	0.09%	0.10%	0.12%	0.23%
Change in Std. Dev.	0.03%	0.05%	0.06%	0.06%	0.08%	0.08%	0.33%

We see in Chart 3 that for most of the risk profiles for the Loring Ward investment models, the 2019 allocation changes led to a small increase in Expected Return, accompanied by a small increase in Expected Volatility.[8]

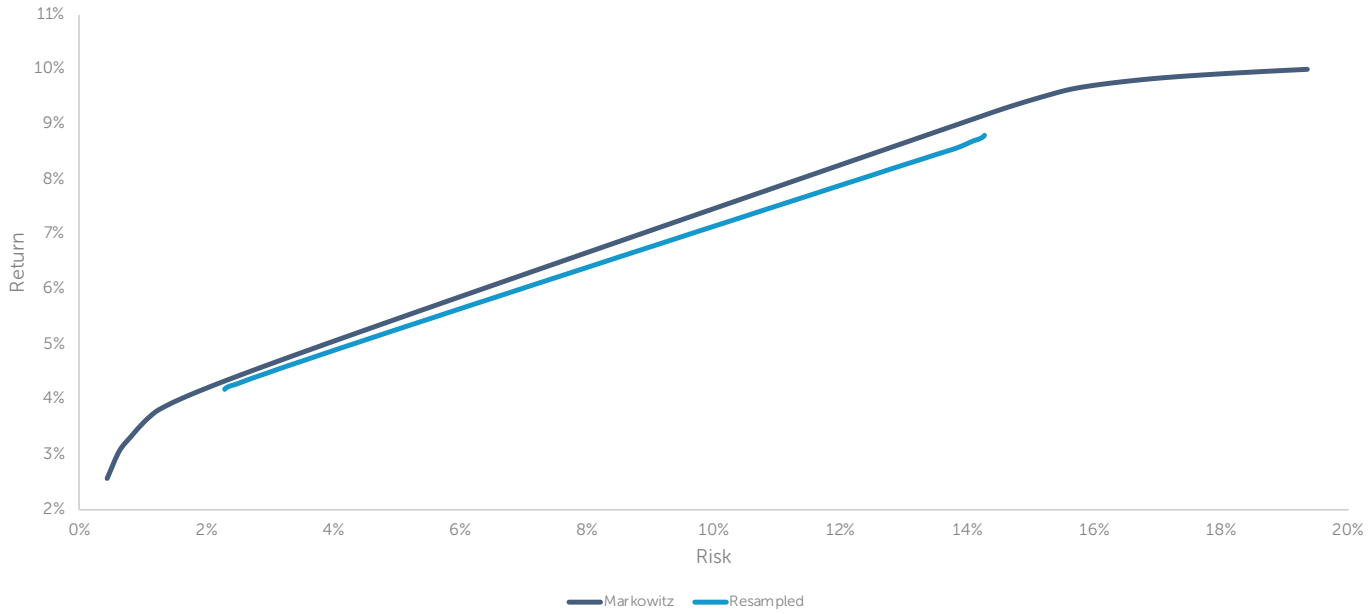
Summary and Conclusion

The changes being made in the Loring Ward Global Portfolio Series are the first implemented model allocation changes in those investment models since 2011. Nevertheless, the changes are not major, they are simply realignments to certain factor exposures that reflect Loring Ward's belief in the opportunities available through factor premia. The impact on Expected Return and Expected Volatility of the model changes is relatively minor, primarily due to the fact that the Loring Ward investment models were already previously optimized against the efficient frontier, and market efficiency suggests that it will typically be difficult to find a new efficient frontier that is significantly superior to a prior one. We see this below in Chart 4, which contrasts the efficient frontier of the existing investment model weights against the efficient frontier we used to derive the 2019 investment model weights.

[8] For the All-Equity risk profile, the change in Expected Volatility is higher than the change in Expected Return. This is primarily the result of moving assets from the very low risk Cash asset class into much higher risk equity asset classes. In the other risk profiles, the reduction in Cash moved into the two Fixed Income asset classes, whose volatility levels are much closer to that of cash. But since the All-Equity risk profile has no fixed income exposure, the increase in Expected Volatility of the resulting portfolio is more pronounced.

CHART 4: Efficient Frontier Comparison

Unconstrained Markowitz vs. Constrained Resampled MVO



The changes implemented within and across the mutual funds used in the models were also minor, driven primarily by opportunities to pay lower expense ratios or to increase exposure to factor premiums in the fixed income markets.

Loring Ward believes that in general, client portfolio target weight allocations should not be changed with great frequency, because efficient markets preclude opportunities to beat the market in the short term. All that happens with frequent allocation changes is the incursion of transaction costs and for tax-sensitive investors, the incursion of realized capital gains. Our CMAs are generated for the long term, and the portfolios we create from those CMAs are also for the long term. Small changes are made from time to time in our CMAs, to keep them aligned to long-run information provided by the markets and when we see that, we make minor changes to our portfolio allocations. These 2019 changes to our investment models reflect our best thinking in that regard.

Appendix A – Our Full Set of 2019 CMA Estimates

TABLE A.1: PORTFOLIO MODELING CMAS

Asset Class	Return	Volatility
Cash & Cash Alternatives	2.50%	0.43%
U.S. Short Investment Grade Bonds	3.35%	1.10%
Global Short Bonds	3.35%	1.12%
U.S. Stocks	7.60%	13.60%
U.S. Large Value Stocks	8.50%	13.48%
U.S. Small Value Stocks	9.50%	17.40%
U.S. REITs	8.00%	19.70%
International Large Value Stocks	8.50%	15.91%
International Small Value Stocks	9.50%	16.05%
Emerging Markets Stocks	10.00%	19.37%

Appendix B – Tax-Managed Mean Variance Optimization

In order to accommodate clients who are tax sensitive, Loring Ward makes available a tax-managed variation of its Global Portfolio Series. There are three aspects of the Tax Managed investment models that distinguish them from the ordinary Global Portfolio Series:

(1) Adjusted CMAs – Returns on the Loring Ward CMAs are adjusted to convert them, as best as possible, to what the returns might be to a tax-sensitive client investing in those asset classes. In so doing we assume a typical client would have a marginal tax rate of 37% on income, 23.8% on dividends, and 23.8% on capital gains and we apply those tax rates to each asset class based on an analysis as to what fraction of our CMA estimate of the Expected Return might be subject to taxation (e.g. for the receipt of dividends, interest, etc).[9]

(2) Tax-Managed MVO – Essentially we use the same Resampled MVO process for our Tax Managed investment models as we use for our standard Global Portfolio Series, with the exception that we apply a tax constraint that eliminates REITs due to their unfavorable tax structure.

(3) Fund Selection – To the extent possible, our Tax Managed investment models invest in tax-managed equity mutual funds and in municipal bond funds for the fixed income exposure. For the 2019 model changes, a new intermediate-duration municipal bond fund has been added to the investment models.

Table B.1 below shows the 2019 allocations to the seven risk profiles for the Loring Ward Tax-Managed investment models. Table B.2 shows the allocation changes in the Tax-Managed models, from the current weights to the new 2019 allocation weights.

TABLE B.1: 2019 LORING WARD ASSET CLASS ALLOCATIONS FOR TAX-MANAGED INVESTMENT MODELS

Asset Class	Defensive (25/75)	Conservative (40/60)	Balanced (50/50)	Moderate (65/35)	Mod. Growth (75/25)	Cap. Apprec. (85/15)	Equity (100/0)
Cash & Cash Alternatives	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
U.S. Short IG Bonds	42.0%	27.5%	19.5%	13.5%	9.5%	5.5%	0.0%
Global Short Bonds	32.5%	32.0%	30.0%	21.0%	15.0%	9.0%	0.0%
U.S. Stocks	5.0%	9.0%	11.0%	15.0%	18.0%	19.0%	21.0%
U.S. Large Value Stocks	6.0%	9.0%	11.0%	14.0%	16.0%	19.0%	22.0%
U.S. Small Neutral Stocks	4.0%	6.0%	8.0%	10.0%	11.0%	13.0%	16.0%
REITs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Intl. Large Value Stocks	7.0%	9.0%	10.0%	13.0%	15.0%	17.0%	20.0%
Intl. Small Neutral Stocks	3.0%	4.0%	5.0%	7.0%	8.0%	9.0%	12.0%
EM Value Stocks	0.0%	3.0%	5.0%	6.0%	7.0%	8.0%	8.5%
Total Equity	25.0%	40.0%	50.0%	65.0%	75.0%	85.0%	99.5%
Total Cash & Fixed Income	75.0%	60.0%	50.0%	35.0%	25.0%	15.0%	0.5%
Total Portfolio	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

[9] A 3.8% tax is added to the 20% maximum dividend and capital gains tax rates to account for Net Investment Income Tax, https://www.irs.gov/taxtopics/tc559.

TABLE B.2: 2019 LORING WARD ASSET CLASS ALLOCATION CHANGES FOR TAX-MANAGED INVESTMENT MODELS

Asset Class	Defensive (25/75)	Conservative (40/60)	Balanced (50/50)	Moderate (65/35)	Mod. Growth (75/25)	Cap. Apprec. (85/15)	Equity (100/0)
Cash & Cash Alternatives	-3.5%	-2.5%	-2.5%	-1.5%	-1.5%	-1.5%	-1.5%
U.S. Short IG Bonds	7.0%	-0.5%	-3.5%	-2.5%	-1.5%	-0.5%	0.0%
Global Short Bonds	-3.5%	3.0%	6.0%	4.0%	3.0%	2.0%	0.0%
U.S. Stocks	0.0%	-1.0%	-1.0%	0.0%	0.0%	-2.0%	-2.0%
U.S. Large Value Stocks	1.0%	2.0%	2.0%	2.0%	2.0%	4.0%	4.0%
U.S. Small Neutral Stocks	1.0%	1.0%		2.0%	2.0%	3.0%	4.0%
REITs	-3.0%	-3.0%	-3.0%	-4.0%	-5.0%	-5.0%	-6.0%
Intl. Large Value Stocks	0.0%	0.0%	-1.0%	-1.0%	0.0%	-1.0%	-1.0%
Intl. Small Neutral Stocks	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%
EM Value Stocks	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	0.5%

Appendix C – Personal Value Investment Models

Loring Ward makes available to clients two sets of investment models with additional restrictions related to personal value. The two sets are the Sustainability models and the Socially Responsible Investing (SRI) models.

The Loring Ward Personal Value investment models follow the same allocation scheme as the ordinary Global Portfolio Series – hence the portfolio changes discussed in the body of this white paper for the Global Portfolio Series also apply to the Personal Value investment models.

What differs for 2019 in the Personal Value models is that Loring Ward has moved these models even further forward such that almost all the invested assets in the models are subject to Personal Value screening. The only asset class in the Personal Value models not subjected to any type of Personal Value screening going forward is the REIT exposure, and the lack of screening for that asset class is due to a lack of viable implementation options in the marketplace.

The Loring Ward team has introduced three new mutual funds to the Personal Value investment models – two new fixed income funds and an emerging markets fund – that are socially screened and that replaced the mutual funds currently in the Personal Value models that are not currently screened. A complete list of the funds that represent the GPS asset classes for the Personal Value models is provided below in table C.1.

TABLE C.1: 2019 MUTUAL FUND SELECTIONS FOR LORING WARD PERSONAL VALUE INVESTMENT MODELS

Asset Class	Socially Responsible Investment Models		Sustainability Investment Models	
	Fund Name	**Ticker**	**Fund Name**	**Ticker**
Cash & Cash Alternatives	Money Market Fund	CASH	Money Market	CASH
U.S. Short Investment Grade Bonds	Vanguard Short-Term Federal Adm	VSGDX	Vanguard Short-Term Federal Adm	VSGDX
U.S. Investment Grade Bonds	DFA Social Fixed Income Institutional	DSFIX	DFA Global Sustainability Fixed Inc Ins	DGSFX
US Core Market/US Value/US Small	DFA US Social Core Equity 2 Portfolio	DFUEX	DFA US Sustainability Core 1	DFSIX
Intl Mkt/Value/ Small	DFA International Social Cor Eq Instl	DSCLX	DFA Intl Sustainability Core 1	DFSPX
Emerging Markets Stocks	DFA Emerging Markets Social Core Port	DFESX	DFA Emerging Markets Sustainability Core 1	DESIX
REITs	DFA Real Estate Securities I	DFREX	DFA Real Estate Securities I	DFREX

Appendix D: Loring Ward's "Tilted" Models

For several years Loring Ward has made available to financial advisors a wide array of variations on its Global Portfolio Series investment models that are referred to as the "Tilted" investment models, as an accommodation to advisors who have clients desiring different levels of model tilts. These tilted models continue to be offered to clients for the foreseeable future; however, it is important to note that these tilted variations to our GPS investment models are not optimized, they are only made available for advisors who seek greater or lesser exposure to certain key factors in our models. Only our GPS models are optimized.

There is a total of 315 such Tactically Tilted models. Each is centered on a given GPS risk profile, as specified in table D.1 below:

TABLE D.1: PORTFOLIO STOCK/BOND RATIOS

Risk Classification	Equity/Fixed Income
Defensive	25%/75%
Conservative	40%/60%
Balanced	50%/50%
Moderate	65%/35%
Moderate Growth	75%/25%
Capital Appreciation	85%/15%
Equity	100%/0%

The first variation imposed on our tilted models is to allow clients to choose higher or lower levels of overall exposure to international equity. The available variations are listed below in table D.2. Please note that our optimized models adhere to a 40% exposure to international equity.

TABLE D.2: PORTFOLIO U.S./INTL. RATIOS

Portfolio Set	Equity/Fixed Income
80	80%/20%
70	70%/30%
60	60%/40%
50	50%/50%
40	40%/60%

The other variations imposed on our tilted models allow clients to choose higher or lower levels of exposure to the key factors of investment style (value vs. growth) or investment size (small cap vs. large cap). Table D.3 below indicates the variation schemes that incorporate these additional factor tilts.

TABLE D.3: VALUE/SMALL TILT PARAMETERS

Parameter	U.S. Equity Relative Exposure				Intl. Equity Relative Exposure		
	U.S. Market	U.S. Large Value	U.S. Small Cap	REITs	Intl. Large Value	Intl. Small Cap	EM Value
1	55%	20%	15%	10%	65%	20%	15%
2	45%	30%	15%	10%	65%	20%	15%
3	35%	40%	15%	10%	65%	20%	15%
4	50%	20%	20%	10%	60%	25%	15%
5	40%	30%	20%	10%	60%	25%	15%
6	30%	40%	20%	10%	60%	25%	15%
7	45%	20%	25%	10%	55%	30%	15%
8	35%	30%	25%	10%	55%	30%	15%
9	25%	40%	25%	10%	55%	30%	15%

Given the flexibility offered by the tilts described in tables D.2 and D.3, a total of 315 different model choices are available for clients to consider. Loring Ward considers the Global Portfolio Series, which are optimized to our CMA estimates, to represent our "best thinking" at the current time, but we make (and will continue to make) the Tactically Tilted portfolios available for clients that wish to pursue more or less factor exposure than our core recommendation.