

## Asset Class Models

At the outset of this engagement, Principal Financial Group identified the asset classes to be used for portfolio construction. In formulating diversified portfolios, Morningstar Investment Management employs a variety of techniques and criteria when developing strategic asset allocation models including:

1. High level review of year-over-year capital market assumption changes
2. Traditional mean-variance optimization
3. Resampled mean-variance optimization
4. Historical mean-variance optimization
5. Portfolio objectives, spacing, and naming
6. Sensitivity analysis
7. Scenario analysis
8. Mean-Conditional Value-at-Risk (M-CVar) / Non-normal distribution analysis
9. Probability of success

The table below displays the asset class models developed for Principal Financial Group by Morningstar Investment Management.

**Table 3. Target Asset Class Models**

### 0-5 Years to Retirement

Asset Class	Portfolios				
	Conservative	Moderate-Conservative	Moderate	Moderate-Aggressive	Aggressive
<b>Large Cap Stocks</b>	2%	2%	4%	4%	4%
<b>Large Cap Growth Stocks</b>	1%	5%	8%	10%	10%
<b>Large Cap Value Stocks</b>	3%	6%	9%	11%	10%
<b>Small/ Mid Cap Stocks</b>	2%	2%	2%	5%	7%
<b>Small/ Mid Cap Growth Stocks</b>	0%	2%	2%	3%	5%
<b>Small/ Mid Cap Value Stocks</b>	0%	3%	4%	4%	7%
<b>International Stocks</b>	2%	5%	11%	13%	17%
<b>Bonds</b>	35%	30%	26%	24%	19%
<b>Short-Term Bonds</b>	55%	45%	34%	26%	21%
<b>Percent Equity</b>	10%	25%	40%	50%	60%
<b>Percent Fixed Income</b>	90%	75%	60%	50%	40%
<b>Expected Arithmetic Return</b>	4.62%	5.44%	6.25%	6.80%	7.42%
<b>Expected Geometric Return</b>	4.53%	5.29%	5.98%	6.42%	6.88%
<b>Standard Deviation</b>	4.29%	5.68%	7.57%	9.13%	10.81%

### 6-10 Years to Retirement

Asset Class	Portfolios				
	Conservative	Moderate-Conservative	Moderate	Moderate-Aggressive	Aggressive
<b>Large Cap Stocks</b>	3%	3%	5%	5%	6%
<b>Large Cap Growth Stocks</b>	2%	4%	8%	9%	11%
<b>Large Cap Value Stocks</b>	3%	5%	9%	10%	12%
<b>Small/ Mid Cap Stocks</b>	3%	3%	4%	4%	5%
<b>Small/ Mid Cap Growth Stocks</b>	0%	2%	2%	6%	8%
<b>Small/ Mid Cap Value Stocks</b>	0%	3%	4%	7%	8%
<b>International Stocks</b>	3%	8%	13%	19%	23%
<b>Bonds</b>	35%	29%	27%	22%	15%
<b>Short-Term Bonds</b>	51%	43%	28%	18%	12%
<b>Percent Equity</b>	14%	28%	45%	60%	73%
<b>Percent Fixed Income</b>	86%	72%	55%	40%	27%
<b>Expected Arithmetic Return</b>	4.84%	5.63%	6.55%	7.45%	8.16%
<b>Expected Geometric Return</b>	4.74%	5.46%	6.22%	6.91%	7.40%
<b>Standard Deviation</b>	4.59%	6.04%	8.35%	10.77%	12.88%

### 11-15 Years to Retirement

Asset Class	Portfolios				
	Conservative	Moderate-Conservative	Moderate	Moderate-Aggressive	Aggressive
<b>Large Cap Stocks</b>	3%	3%	5%	5%	6%
<b>Large Cap Growth Stocks</b>	2%	5%	9%	11%	14%
<b>Large Cap Value Stocks</b>	3%	6%	10%	13%	15%
<b>Small/ Mid Cap Stocks</b>	3%	4%	5%	5%	7%
<b>Small/ Mid Cap Growth Stocks</b>	0%	2%	3%	7%	9%
<b>Small/ Mid Cap Value Stocks</b>	2%	4%	5%	7%	9%
<b>International Stocks</b>	4%	10%	15%	23%	26%
<b>Bonds</b>	33%	26%	23%	16%	9%
<b>Short-Term Bonds</b>	50%	40%	25%	13%	5%
<b>Percent Equity</b>	17%	34%	52%	71%	86%
<b>Percent Fixed Income</b>	83%	66%	48%	29%	14%
<b>Expected Arithmetic Return</b>	5.01%	5.96%	6.94%	8.04%	8.85%
<b>Expected Geometric Return</b>	4.90%	5.74%	6.52%	7.32%	7.83%
<b>Standard Deviation</b>	4.82%	6.81%	9.43%	12.50%	15.01%

**16+ Years to Retirement**

Asset Class	Portfolios				
	Conservative	Moderate-Conservative	Moderate	Moderate-Aggressive	Aggressive
<b>Large Cap Stocks</b>	3%	4%	6%	7%	7%
<b>Large Cap Growth Stocks</b>	3%	6%	9%	11%	14%
<b>Large Cap Value Stocks</b>	4%	7%	10%	12%	15%
<b>Small/ Mid Cap Stocks</b>	3%	5%	7%	8%	9%
<b>Small/ Mid Cap Growth Stocks</b>	0%	2%	4%	8%	11%
<b>Small/ Mid Cap Value Stocks</b>	2%	4%	6%	9%	12%
<b>International Stocks</b>	5%	12%	18%	25%	32%
<b>Bonds</b>	31%	24%	19%	13%	0%
<b>Short-Term Bonds</b>	49%	36%	21%	7%	0%
 <b>Percent Equity</b>	20%	40%	60%	80%	100%
<b>Percent Fixed Income</b>	80%	60%	40%	20%	0%
 <b>Expected Arithmetic Return</b>	5.16%	6.28%	7.40%	8.56%	9.66%
<b>Expected Geometric Return</b>	5.04%	6.01%	6.87%	7.66%	8.30%
<b>Standard Deviation</b>	5.08%	7.64%	10.72%	14.07%	17.41%