

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
Large Cap Stocks	2%	2%	4%	4%	4%
Large Cap Growth Stocks	1%	5%	8%	10%	10%
Large Cap Value Stocks	3%	6%	9%	11%	10%
Small/ Mid Cap Stocks	2%	2%	2%	5%	7%
Small/ Mid Cap Growth Stocks	0%	2%	2%	3%	5%
Small/ Mid Cap Value Stocks	0%	3%	4%	4%	7%
International Stocks	2%	5%	11%	13%	17%
Bonds	35%	30%	26%	24%	19%
Short-Term Bonds	55%	45%	34%	26%	21%
Percent Equity	10%	25%	40%	50%	60%
Percent Fixed Income	90%	75%	60%	50%	40%
Expected Arithmetic Return	4.62%	5.44%	6.25%	6.80%	7.42%
Expected Geometric Return	4.53%	5.29%	5.98%	6.42%	6.88%
Standard Deviation	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
Large Cap Stocks	3%	3%	5%	5%	6%
Large Cap Growth Stocks	2%	4%	8%	9%	11%
Large Cap Value Stocks	3%	5%	9%	10%	12%
Small/ Mid Cap Stocks	3%	3%	4%	4%	5%
Small/ Mid Cap Growth Stocks	0%	2%	2%	6%	8%
Small/ Mid Cap Value Stocks	0%	3%	4%	7%	8%
International Stocks	3%	8%	13%	19%	23%
Bonds	35%	29%	27%	22%	15%
Short-Term Bonds	51%	43%	28%	18%	12%
Percent Equity	14%	28%	45%	60%	73%
Percent Fixed Income	86%	72%	55%	40%	27%
Expected Arithmetic Return	4.84%	5.63%	6.55%	7.45%	8.16%
Expected Geometric Return	4.74%	5.46%	6.22%	6.91%	7.40%
Standard Deviation	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
Large Cap Stocks	3%	3%	5%	5%	6%
Large Cap Growth Stocks	2%	5%	9%	11%	14%
Large Cap Value Stocks	3%	6%	10%	13%	15%
Small/ Mid Cap Stocks	3%	4%	5%	5%	7%
Small/ Mid Cap Growth Stocks	0%	2%	3%	7%	9%
Small/ Mid Cap Value Stocks	2%	4%	5%	7%	9%
International Stocks	4%	10%	15%	23%	26%
Bonds	33%	26%	23%	16%	9%
Short-Term Bonds	50%	40%	25%	13%	5%
Percent Equity	17%	34%	52%	71%	86%
Percent Fixed Income	83%	66%	48%	29%	14%
Expected Arithmetic Return	5.01%	5.96%	6.94%	8.04%	8.85%
Expected Geometric Return	4.90%	5.74%	6.52%	7.32%	7.83%
Standard Deviation	4.82%	6.81%	9.43%	12.50%	15.01%

16+ Years to Retirement

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