



**Western**  
UNIVERSITY • CANADA

# Diversified Equity Fund Review

December 3, 2012



Diversified Equity Fund Review 2

December 3, 2012

# Agenda

- Goal
- Strategy
- Decisions
  - Select investment strategies
  - Asset mix
  - Currency hedging
  - Small cap VS Large cap
  - Active VS Passive
  - Canadian equity component
  - EAFE Component
- Simulations
- Fees
- Timeline

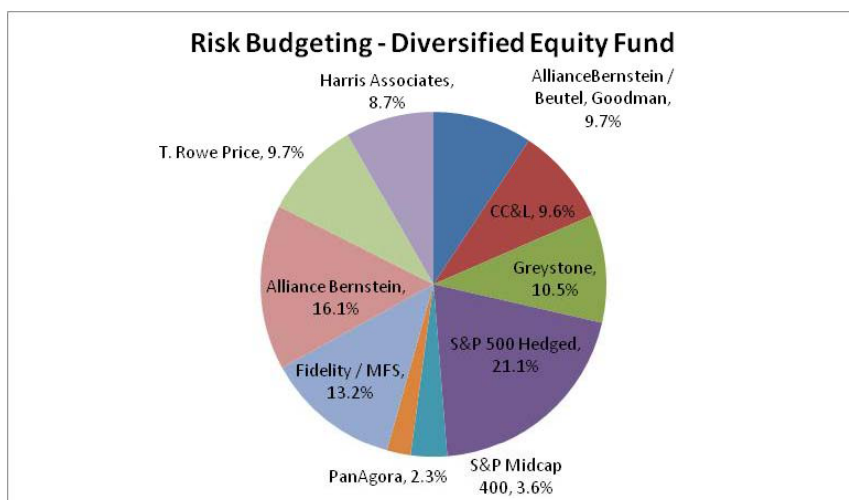
## Goal

- Optimize the Diversified Equity Fund by increasing its expected return and/or reducing its volatility.

# Diversified Equity Fund Performance

	Annualized Returns as of August 31, 2012					
	1-Yr	2-Yr	3-Yr	4-Yr	5-Yr	10-Yr
Diversified Equity Fund	3.52%	4.78%	3.71%	-1.74%	-3.48%	4.28%
Benchmark	4.56%	6.44%	5.34%	-0.36%	-2.24%	4.02%
Value Added	-1.04%	-1.66%	-1.63%	-1.38%	-1.24%	0.27%
	Volatility as of August 31, 2012					
	1-Yr	2-Yr	3-Yr	4-Yr	5-Yr	10-Yr
Diversified Equity Fund	14.32%	12.71%	12.39%	16.81%	15.77%	13.23%
Benchmark	12.97%	11.67%	11.61%	16.28%	15.31%	12.80%
Difference	1.35%	1.04%	0.78%	0.54%	0.46%	0.43%

# Risk Attribution



# Strategy

1. Capture sources of additional return
2. Add diversifiers to the portfolio to lower the risk of the portfolio

# Decisions



# Decisions

1. New investment strategies
2. Asset mix of the fund
3. Currency hedging strategy
4. Small cap VS large cap allocation
5. Active VS passive strategy
6. Canadian equity component
7. EAFE equity component

# Investment Strategies



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# Investment Strategies

1. Capture sources of additional return
  - Global small cap equities
  - Emerging markets equities
  - Private equity
  - Active currency management
  - Global tactical asset allocation
2. Add diversifiers to the portfolio to lower the risk of the portfolio
  - Low volatility equity strategies
  - Commodities
  - Market neutral strategies
  - Long/short equities
  - Real estate
  - Infrastructure

# Pros & Cons

Strategy	Pros	Cons
Global small cap equities	<ul style="list-style-type: none"> <li>•Higher expected return than large cap stocks</li> <li>•Lower correlation with large cap stocks</li> <li>•Greater potential for active management</li> </ul>	<ul style="list-style-type: none"> <li>•Higher volatility</li> <li>•Less liquid</li> <li>•Higher investment management fees</li> <li>•Higher transaction costs</li> <li>•Current valuation levels less attractive</li> </ul>
Emerging markets equities	<ul style="list-style-type: none"> <li>•Emerging markets are a source of growth for the global economy</li> <li>•Market capitalization of emerging markets is growing</li> <li>•Likely flow of investments may grow opportunity and liquidity</li> <li>•Diversifier to developed markets</li> <li>•Potential for higher returns</li> <li>•Attractive investment opportunities for companies located therein</li> <li>•Attractive demographics</li> <li>•Emergence of middle class</li> <li>•Enormous pool of cheap labour</li> <li>•Stronger fiscal positions</li> </ul>	<ul style="list-style-type: none"> <li>•Increases portfolio risk</li> <li>•Lower liquidity</li> <li>•Higher investment management fees</li> <li>•Higher transaction costs</li> <li>•Increasing correlations with developed markets</li> <li>•Inconsistent legal and regulatory framework</li> <li>•Transparency</li> <li>•Stronger GDP growth does not necessarily translate into stronger stock market performance</li> </ul>

# Pros & Cons

Strategy	Pros	Cons
Low volatility equity strategies	<ul style="list-style-type: none"> <li>•Historically higher returns and lower volatility than traditional portfolios</li> <li>•Low fees</li> <li>•Research suggests that anomaly may persist</li> <li>•Can be implemented in a passive way</li> </ul>	<ul style="list-style-type: none"> <li>•Large tracking error</li> <li>•Outperformance may not re-occur in the future</li> <li>•Short history for products on the market</li> <li>•May experience extended periods of underperformance</li> </ul>
Commodities	<ul style="list-style-type: none"> <li>•Low correlation with traditional asset classes</li> <li>•Strong demand expected for natural resources and commodities</li> <li>•Provide an inflation hedge</li> <li>•Higher alpha generation potential</li> </ul>	<ul style="list-style-type: none"> <li>•Commodities don't generate any income</li> <li>•Returns based on supply and demand; limited profit potential</li> <li>•Non-traditional investment</li> <li>•Volatile returns</li> </ul>

# Asset Mix



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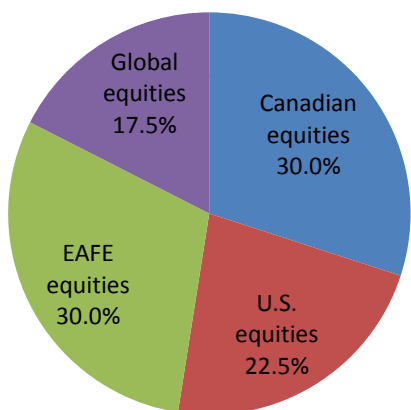
# Diversified Equity Fund Composition

Investment Manager	% of the Fund	Asset Class	Manager Style
Greystone Managed Investment	10.0%	Canadian Equities	Active-Growth
Connor, Clark & Lunn Investment Management	10.0%	Canadian Equities	Active-Core
Beutel, Goodman & Company	10.0%	Canadian Equities	Active-Value
State Street Global Asset Management	17.5%	U.S. Large Cap Equities – Hedged	Passive
State Street Global Asset Management	2.5%	U.S. Mid Cap Equities	Passive
PanAgora Asset Management	2.5%	U.S. Small Cap Equities	Active-Core
Pyramis Global Advisors	15.0%	International Equities	Active-Growth
AllianceBernstein Capital Management	15.0%	International Equities	Active-Value
Harris Associates	8.75%	Global Equities	Active-Value
T. Rowe Price	8.75%	Global Equities	Active-Growth

# Asset Mix Comparison

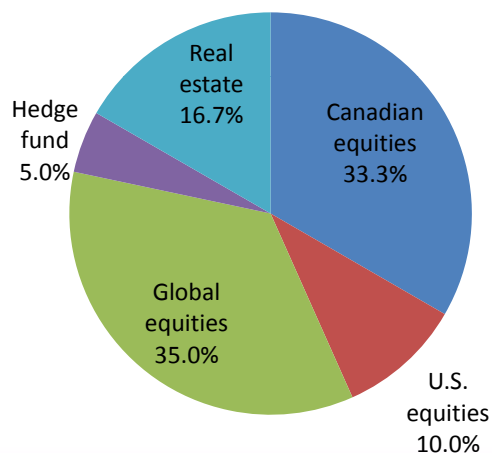
**Diversified Equity Fund**

**Weight (%)**



**UBC Faculty Pension Plan Equity Portfolio**

**Weight (%)**



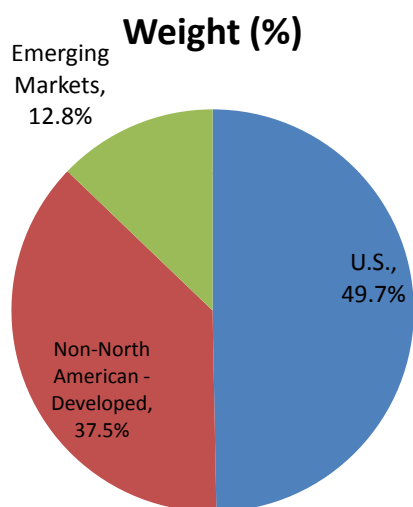
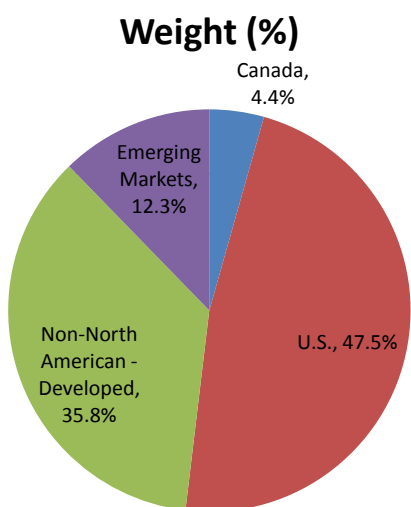


# Asset Mix Comparison

As of August 31, 2012

**MSCI World All-Country Index**

**MSCI World AC ex-Canada**



## Equity Funds of Funds Asset Mix

	Average	Median	Max	Min	Diversified Equity Fund
Canadian equity	44.2%	40.1%	72.2%	21.8%	30.0%
U.S. equity	13.4%	14.1%	27.8%	0.0%	17.5%
EAFE equity	12.8%	13.7%	35.6%	0.0%	30.0%
Global equity	16.3%	13.7%	64.7%	0.0%	17.5%
Emerging markets equity	3.3%	4.5%	15.0%	0.0%	0.0% <sup>1</sup>
Small Cap	5.8%	5.0%	23.1%	0.0%	5.0%
Real estate	2.1%	0.0%	10.5%	0.0%	0.0%
Infrastructure	1.1%	0.0%	12.5%	0.0%	0.0%
Commodity	0.9%	0.0%	9.3%	0.0%	0.0%

<sup>1</sup> The Diversified Equity Fund exposure to emerging markets was 4.9% as of June 30, 2012 when the emerging markets investments in the global equity and EAFE equity mandates are included.

# Potential Rebalancing Guidelines

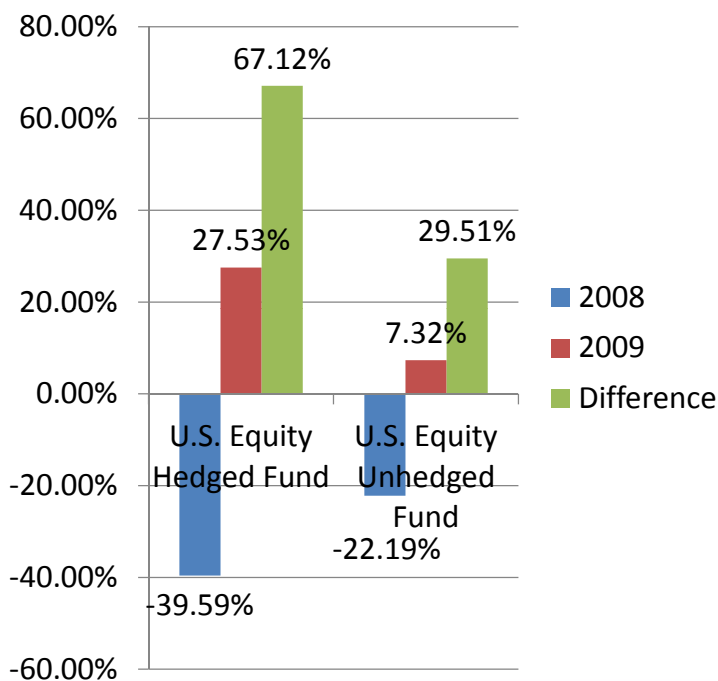
- Leave Canadian equity at 30%
- U.S. / EAFE mix should reflect world equity markets mix of 49.7% / 50.3%
- Private equity and global commodities should fit in the global equity sleeve
- Emerging markets equity is included in the total EAFE allocation
- Minimum 5% allocation to any strategy
- Maximum 10% allocation for illiquid strategies
- Focus on global equity versus U.S. / EAFE

# Currency Hedging

### Currency Hedging Strategy

- The U.S. equity large cap and U.S. equity mid cap strategies, which account for 20% of the Fund, are 100% currency hedged
- The U.S. equity small cap strategy, which accounts for 2.5% of the Fund, is not currency hedged
- The global and EAFE equity strategies, which account for 47.5% of the Fund in total, are not currency hedged

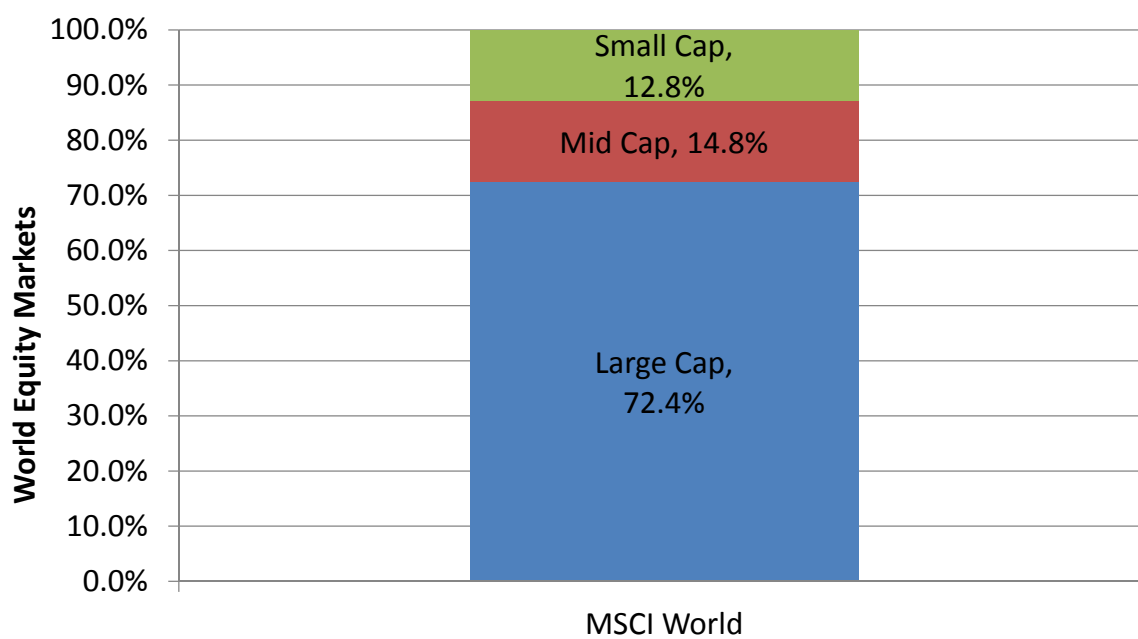
### Is currency hedging reducing portfolio volatility?



# Small Cap VS Large Cap

## World Markets Breakdown

Source: MSCI August 2012

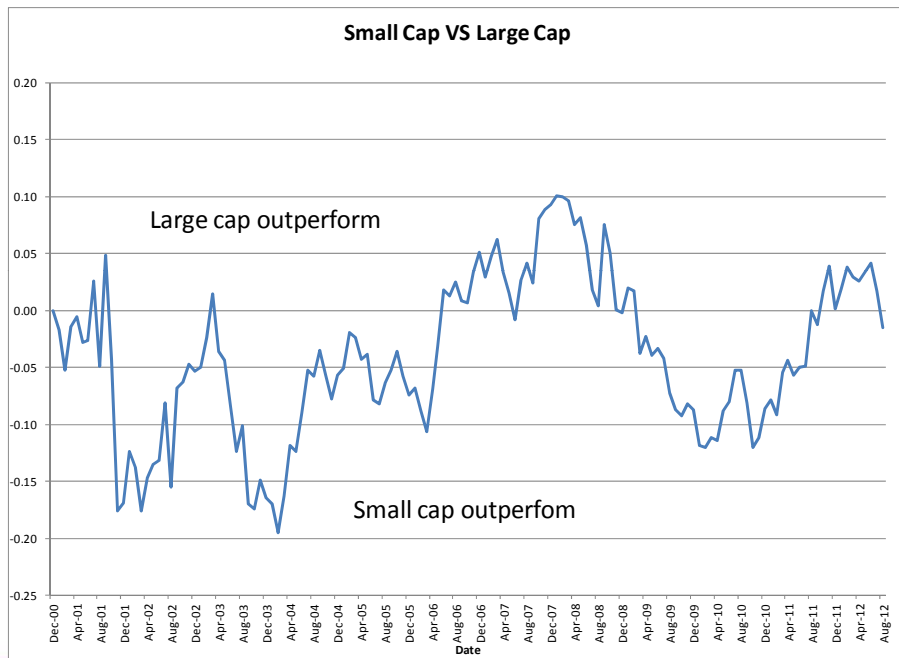


## Small Cap VS Large Cap

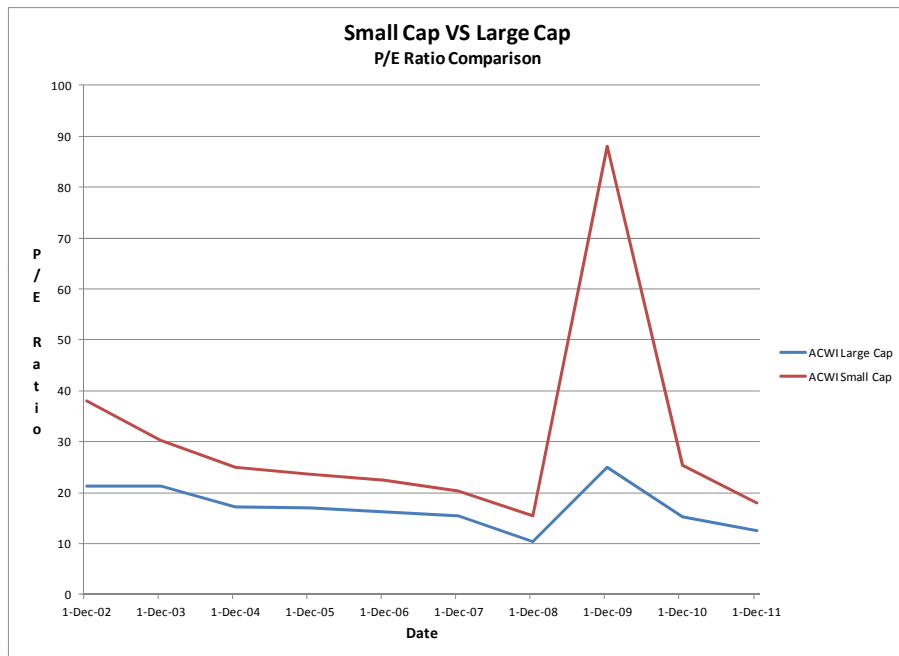
	Calendar Year Returns											
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012 YTD
MSCI World	-11.35%	-20.53%	10.27%	6.67%	6.64%	21.00%	-6.66%	-26.93%	12.89%	6.54%	-2.85%	6.02%
MSCI World Small Cap	7.58%	-16.56%	29.58%	15.66%	13.17%	17.11%	-14.23%	-26.95%	22.92%	19.97%	-6.44%	6.62%
Difference	-18.93%	-3.97%	-19.31%	-8.99%	-6.53%	3.89%	7.57%	0.02%	-10.03%	-13.43%	3.60%	-0.59%
	Annualized Returns as of August 31, 2012											
	1-Yr	2-Yr	3-Yr	4-Yr	5-Yr	6-Yr	7-Yr	8-Yr	9-Yr	10-Yr	11-Yr	
MSCI World	8.61%	7.11%	4.50%	-0.50%	-2.72%	-0.36%	0.84%	1.63%	2.53%	2.18%	0.33%	
MSCI World Small Cap	6.81%	8.90%	7.58%	2.80%	-0.51%	1.07%	1.89%	3.66%	4.97%	5.75%	4.31%	
Difference	1.80%	-1.79%	-3.08%	-3.29%	-2.21%	-1.43%	-1.05%	-2.03%	-2.44%	-3.57%	-3.98%	
	Standard Deviation of Returns as of August 31, 2012											
	1-Yr	2-Yr	3-Yr	4-Yr	5-Yr	6-Yr	7-Yr	8-Yr	9-Yr	10-Yr	11-Yr	
MSCI World	9.86%	9.98%	9.91%	14.00%	13.46%	12.76%	12.22%	11.87%	11.66%	12.38%	12.61%	
MSCI World Small Cap	12.81%	12.53%	12.31%	17.64%	16.69%	15.78%	15.40%	14.87%	14.59%	14.87%	15.38%	
Difference	-2.96%	-2.55%	-2.40%	-3.65%	-3.24%	-3.02%	-3.17%	-3.00%	-2.94%	-2.49%	-2.78%	



# Small Cap VS Large Cap

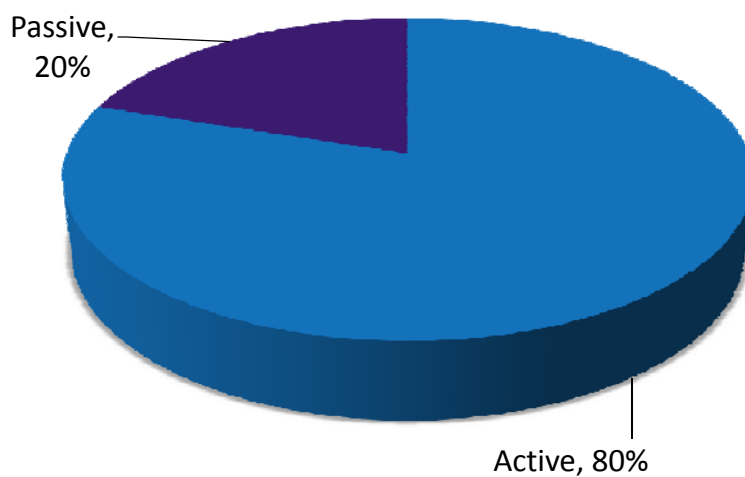


# Small Cap VS Large Cap



# Active VS Passive Management

# Active VS Passive Management



# Canadian Equity Component



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## Canadian Equity

Existing Components	Potential Additions
Bottom-up core strategy (CC&L)	Low-volatility strategy
Bottom-up value strategy (Beutel, Goodman)	Small-cap strategy
Bottom-up growth strategy (Greystone)	Top-down approach

# EAFE Equity Component



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## AllianceBernstein's Status

	Reason to Terminate	Status
Personnel	Departure of the two lead portfolio managers: Kevin Simms and Henry D'Auria	Negative trend: Although both are still at AllianceBernstein in similar capacities, the firm restructured earlier in the year and Kevin is now the only lead portfolio manager on the strategy and Henry D'Auria focuses on emerging markets equity, including the portion that our fund invests in. The fact that Kevin Simms is not Director of Value Research anymore is a positive development though.
	Investment analyst pool going down dramatically	Negative trend: The number of value analysts has gone down by about 15% from previous highs. They are still adequately staffed compared to peers though.
Organization	Firm facing financial difficulties	No issue: Although the firm recorded a loss of \$93 million in 2011, it was due to a one-time non-cash deferred compensation charge of \$587 million. Cash flow from operations are still positive at \$146 million.
	Firm in the process of being sold or liquidated	No issue
Investment Process	Deviation from investment process	No change
	Significant portfolio turnover as a result of poor decisions	Annual portfolio turnover of 20% - 30%
Performance	Extremely poor performance	Negative trend. Significant underperformance, even when compared to other value managers.
	No outperformance when value spreads compress	No issue
Other	Strategy downgraded to terminate by Russell	No change



# Performance Comparison

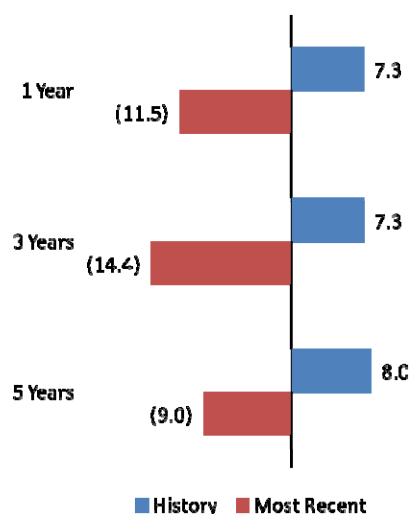
(As of September 30, 2012)

	Annual Returns													
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
<b>Templeton</b>	7.88%	-9.39%	-1.03%	3.08%	-23.56%	15.77%	14.99%	17.08%	17.48%	8.41%	-18.88%	-15.93%	9.76%	37.43%
<b>MSCI EAFE</b>	7.85%	-7.92%	-1.30%	4.21%	-25.64%	11.22%	14.55%	15.36%	14.49%	7.20%	-15.18%	-24.97%	5.64%	26.09%
<i>Value added</i>	0.03%	-1.47%	0.27%	-1.14%	2.08%	4.55%	0.44%	1.72%	2.99%	1.21%	-3.70%	9.04%	4.12%	11.34%
<b>AllianceBernstein</b>	0.43%	-13.05%	-5.93%	0.59%	-32.27%	13.93%	19.71%	21.15%	17.91%	12.39%	-8.79%	-10.16%	-0.05%	24.31%
<b>MSCI EAFE</b>	7.85%	-7.92%	-1.30%	4.21%	-25.64%	11.22%	14.55%	15.36%	14.49%	7.20%	-15.18%	-24.97%	5.64%	26.09%
<i>Value added</i>	-7.41%	-5.12%	-4.64%	-3.63%	-6.63%	2.72%	5.16%	5.78%	3.42%	5.18%	6.39%	14.81%	-5.70%	-1.78%

	Annualized Returns														
	1-Yr	2-Yr	3-Yr	4-Yr	5-Yr	6-Yr	7-Yr	8-Yr	9-Yr	10-Yr	11-Yr	12-Yr	13-Yr	14-Yr	Since Inception
<b>Templeton</b>	7.88%	-1.13%	-1.10%	-0.07%	-5.28%	-2.06%	0.21%	2.18%	3.77%	4.23%	1.88%	0.26%	0.96%	3.21%	3.12%
<b>MSCI EAFE</b>	7.85%	-0.35%	-0.67%	0.53%	-5.35%	-2.77%	-0.47%	1.38%	2.76%	3.20%	1.37%	-1.14%	-0.63%	1.07%	1.51%
<i>Value added</i>	0.03%	-0.78%	-0.43%	-0.60%	0.07%	0.71%	0.68%	0.79%	1.01%	1.03%	0.51%	1.40%	1.59%	2.14%	1.60%
<b>AllianceBernstein</b>	0.43%	-6.55%	-6.34%	-4.66%	-10.96%	-7.22%	-3.78%	-0.97%	0.97%	2.05%	1.02%	0.03%	0.03%	1.59%	1.61%
<b>MSCI EAFE</b>	7.85%	-0.35%	-0.67%	0.53%	-5.35%	-2.77%	-0.47%	1.38%	2.76%	3.20%	1.37%	-1.14%	-0.63%	1.07%	1.51%
<i>Value added</i>	-7.41%	-6.20%	-5.68%	-5.19%	-5.61%	-4.45%	-3.32%	-2.36%	-1.80%	-1.14%	-0.36%	1.17%	0.66%	0.52%	0.10%

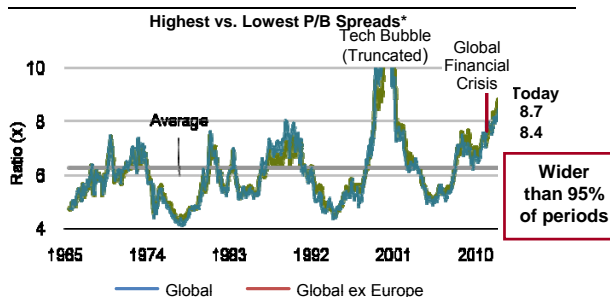
# AllianceBernstein's Performance

**Postcrisis Value Returns Are Among the Worst on Record**  
(Relative performance of cheapest versus most expensive stocks)

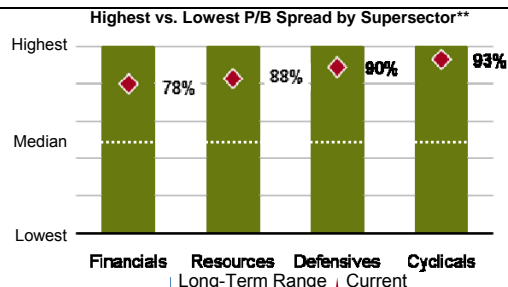


# Value Opportunity

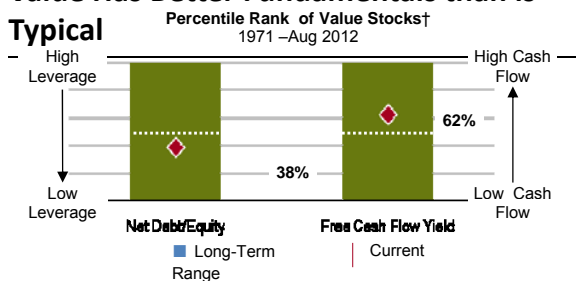
## The Value Opportunity Is Enormous



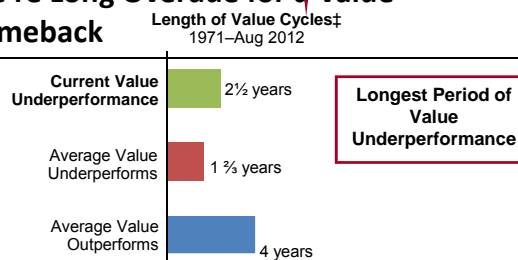
## Opportunity is Spread Across Sectors



## Value Has Better Fundamentals than is Typical



## We're Long Overdue for a Value Comeback



# Impact of Value Spread Compression

## International Equity

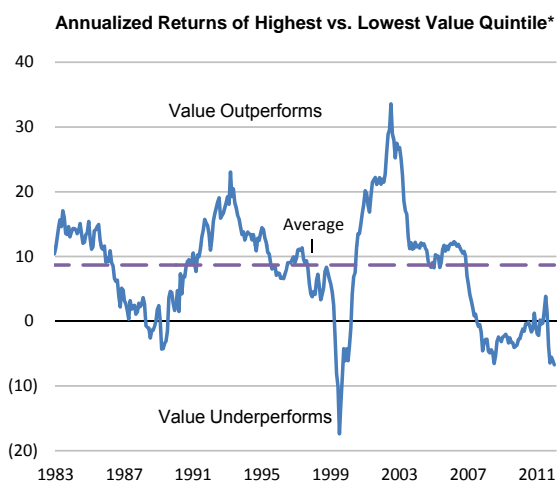
	International Value— Developed Performance (USD)**	
	Absolute	vs. MSCI EAFE
1998–1999	29.3%	(23.1)%
<b>2000</b>	<b>(2.7)%</b>	<b>+11.5%</b>
<b>2001</b>	<b>(12.8)</b>	<b>+8.7</b>
<b>2002</b>	<b>(5.5)</b>	<b>+10.4</b>
<b>2003</b>	<b>41.9</b>	<b>+3.4</b>
<b>2004</b>	<b>25.5</b>	<b>+5.3</b>
<b>2005</b>	<b>18.0</b>	<b>+4.5</b>
<b>2006</b>	<b>31.8</b>	<b>+5.4</b>
2000–2006	122.3%	+86.82%

## U.S. Equity

	US Strategic Value Performance (USD)**	
	Absolute	vs. S&P 500
1989–1990	(6.3)%	(33.9)%
<b>1991</b>	<b>32.6%</b>	<b>+2.1%</b>
<b>1992</b>	<b>26.9</b>	<b>+19.3</b>
<b>1993</b>	<b>27.3</b>	<b>+17.2</b>
<b>1994</b>	<b>1.3</b>	<b>(0.0)</b>
<b>1995</b>	<b>38.0</b>	<b>+0.4</b>
<b>1996</b>	<b>24.7</b>	<b>+1.7</b>
1991–1996	273.3	+108.4%

# Even a Sideways Value Market Should Yield Improved Performance

## Value Performance Is Cyclical



## Underperformance Has Been Unusually Severe

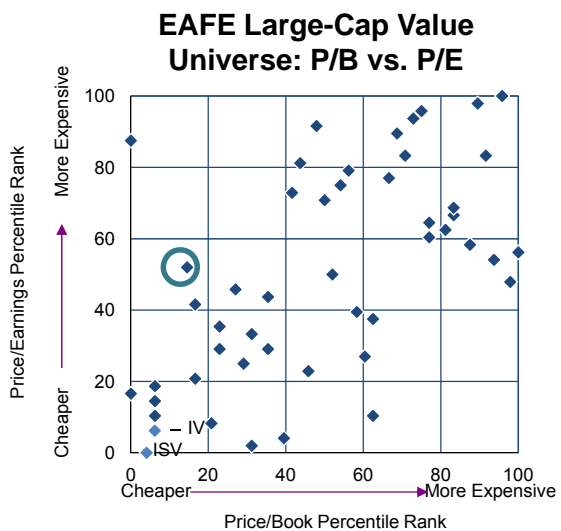
Value Factor Performance*	Global Value	
	Quarterly Relative Return†	No. of Qtrs. Last Five Years
Best Third	+3.3%	4
Neutral Third	+0.6%	2
Worst Third	(2.3)%	14

70% of Quarters

\*Rolling-three-year returns of a composite of half the lowest quintile of Bernstein global stock universe based on price/book value and half the lowest quintile of price/trailing earnings  
 \*\*Defined as the top, middle and bottom one-thirds of total return distributions for the lowest minus highest quintile of stocks in the Bernstein global universe based on price/book, from January 1, 1971 to September 30, 2012.  
 †Average quarterly returns of a representative Global Value account versus the MSCI World since September 1995 inception, hedged in USD. Past performance is no guarantee of future results.



# Value Chart



# Simulations

# Simulations

- Historical manager returns
  - From January 2007 to August 2012
- Historical index returns
  - From January 2002 to August 2012
- Mean-variance optimization
  - 10-yr strategic returns, standard deviations and correlation coefficients provided by Russell Investments

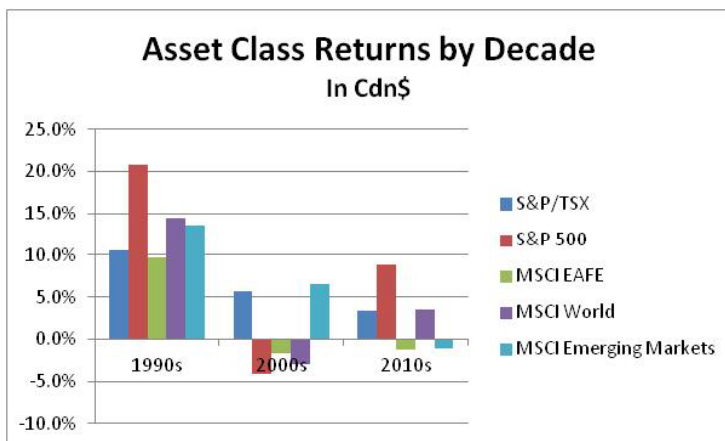


## Joint Pension Board Feedback

- Members generally not comfortable with commodities
- Members relatively comfortable with low-volatility equity, global small cap equity and emerging markets equity
- Issues:
  - Low volatility equity: 20% may be too high given the short history of the strategy
  - Global small cap equity: concerns about timing of entry
  - Emerging markets equity: concerns about timing of entry and existing exposure to emerging markets

### Timing of Entry

- Higher expected returns when valuations are cheap
- Cheap valuations occur when there's controversy and negative sentiment
- See article: "Equity Perspectives: Global Equities – Disappointment, Volatility and Opportunity" by Scott Berg of T. Rowe Price



## Potential Portfolios

Portfolio	Details
9	Reducing allocation to EAFE equity, adding global small cap equity, adding global low volatility equity
10	Reducing allocation to EAFE equity, replacing 50% of U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity
11	Reducing allocation to EAFE equity, replacing 50% of U.S. equity with U.S. low volatility equity, adding emerging markets equity
12	Reducing allocation to EAFE equity, adding low-volatility equity to Canadian equity component, adding emerging markets equity, adding global small cap equity

# Potential Portfolios

Investment Manager	Existing Fund	Potential Portfolios				Asset Class	Manager Style
Greystone Managed Investment	10.0%	10.0%	10.0%	10.0%	7.5%	Canadian Equities	Active-Growth
Connor, Clark & Lunn Investment Management	10.0%	10.0%	10.0%	10.0%	7.5%	Canadian Equities	Active-Core
Beutel, Goodman & Company	10.0%	10.0%	10.0%	10.0%	7.5%	Canadian Equities	Active-Value
State Street Global Asset Management	17.5%	18.0%	10.0%	10.0%	20.0%	U.S. Large Cap Equities – Hedged	Passive
TBD	0.0%	0.0%	10.0%	10.0%	0.0%	U.S. Large Cap Equities (Low Volatility) - Hedged	TBD
State Street Global Asset Management	2.5%	0.0%	0.0%	0.0%	0.0%	U.S. Mid Cap Equities	Passive
PanAgora Asset Management	2.5%	0.0%	0.0%	0.0%	0.0%	U.S. Small Cap Equities	Active-Core
MFS Investment	15.0%	9.0%	8.0%	8.0%	8.0%	International Equities	Active-Growth
AllianceBernstein Capital Management	15.0%	9.0%	8.0%	8.0%	8.0%	International Equities	Active-Value
Harris Associates	8.75%	10.0%	12.0%	14.5%	12.0%	Global Equities	Active-Value
T. Rowe Price	8.75%	10.0%	12.0%	14.5%	12.0%	Global Equities	Active-Growth
TBD	0.0%	5.0%	5.0%	0.0%	5.0%	Global Small Cap Equities	Active - TBD
TBD	0.0	0.0%	5.0%	5.0%	5.0%	Emerging Markets Equities	Active – TBD
TBD	0.0%	9.0%	0.0%	0.0%	0.0%	Global Equities (Low Volatility)	TBD
TBD	0.0%	0.0%	0.0%	0.0%	7.5%	Canadian Equities (Low Volatility)	TBD

## Potential Portfolios

(By Asset Class)

Asset Class	Existing Portfolio	Portfolio 9	Portfolio 10	Portfolio 11	Portfolio 12
Cdn Large Cap Equity	30.00%	30.00%	30.00%	30.00%	22.50%
Cdn Small Cap Equity	0.00%	0.00%	0.00%	0.00%	0.00%
U.S. Large Cap Equity Hedged	17.50%	18.00%	10.00%	10.00%	20.00%
U.S. Large Cap Equity Unhedged	0.00%	0.00%	0.00%	0.00%	0.00%
U.S. Mid Cap Equity Hedged	2.50%	0.00%	0.00%	0.00%	0.00%
U.S. Small Cap Equity Unhedged	2.50%	0.00%	0.00%	0.00%	0.00%
EAFE Equity	30.00%	18.00%	16.00%	16.00%	16.00%
Emerging Markets Equity	0.00%	0.00%	5.00%	5.00%	5.00%
Global Equity (Developed)	17.50%	20.00%	24.00%	29.00%	24.00%
Global Equity (Developed + Emerging)	0.00%	0.00%	0.00%	0.00%	0.00%
Global Small Cap Equity	0.00%	5.00%	5.00%	0.00%	5.00%
Global Commodities	0.00%	0.00%	0.00%	0.00%	0.00%
Low-Volatility Cdn Equity	0.00%	0.00%	0.00%	0.00%	7.50%
Low-Volatility U.S. Equity Hedged	0.00%	0.00%	10.00%	10.00%	0.00%
Low Volatility U.S. Equity Unhedged	0.00%	0.00%	0.00%	0.00%	0.00%
Low-Volatility Global Equity (Developed)	0.00%	0.00%	0.00%	0.00%	0.00%
Low-Volatility Global Equity (Developed + Emerging)	0.00%	9.00%	0.00%	0.00%	0.00%
<i>Total Emerging Markets Equity Allocation</i>	<i>4.9%</i>	<i>5.3%</i>	<i>9.5%</i>	<i>10.1%</i>	<i>9.5%</i>

# Historical Manager Returns

•For the period January 2007 to August 2012

•Returns are gross of fees

•New strategies don't assume any value added from active management

•Substantial increase in returns, reduction in volatility and increase in Sharpe ratio for all proposed portfolios

Portfolio	Expected Return	Volatility	Sharpe Ratio
Existing Portfolio	-1.47%	14.66%	-0.226
Portfolio 9	-0.46%	13.16%	-0.176
Portfolio 10	0.10%	13.67%	-0.128
Portfolio 11	0.37%	13.94%	-0.106
Portfolio 12	-0.17%	13.88%	-0.146

# Historical Index Returns

•For the period January 2002 to August 2012

•Returns are gross of fees

•New strategies don't assume any value added from active management

•Increase in returns, reduction in volatility and increase in Sharpe ratio

Portfolio	Expected Return	Volatility	Sharpe Ratio
Existing Portfolio	3.25%	12.98%	0.072
Portfolio 9	3.53%	12.28%	0.099
Portfolio 10	3.89%	12.60%	0.125
Portfolio 11	3.69%	12.50%	0.110
Portfolio 12	3.82%	12.79%	0.117

# Mean-Variance Optimization

•Based on Russell's Strategic Planning Assumptions

•Caveats:

•Russell has no parameters for small cap equity and low-volatility equity

•Parameter used for low-volatility equity assumes lower return than traditional equity, which is very conservative

Portfolio	Expected Return	Volatility	Sharpe Ratio
Existing Portfolio	6.74%	18.12%	0.239
Portfolio 9	6.70%	18.05%	0.238
Portfolio 9*	6.78%	18.01%	0.243
Portfolio 10	6.74%	18.14%	0.239
Portfolio 10*	6.83%	18.14%	0.244
Portfolio 11	6.73%	17.97%	0.241
Portfolio 11*	6.82%	17.97%	0.246
Portfolio 12	6.77%	18.45%	0.237
Portfolio 12*	6.83%	18.45%	0.240

\* Assuming that the low-volatility equity returns are the same as traditional equity



# Accumulated Assets

**Terminal value: \$161,000**

**Drawdown: \$37,000**

**Assumptions:**

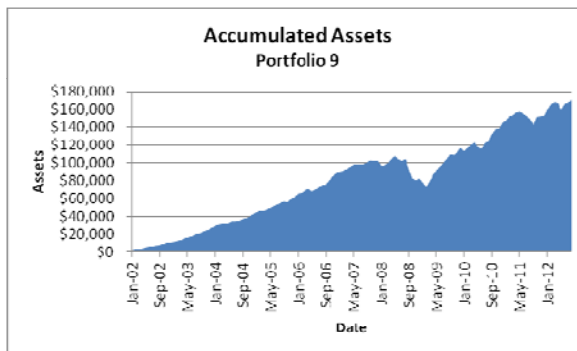
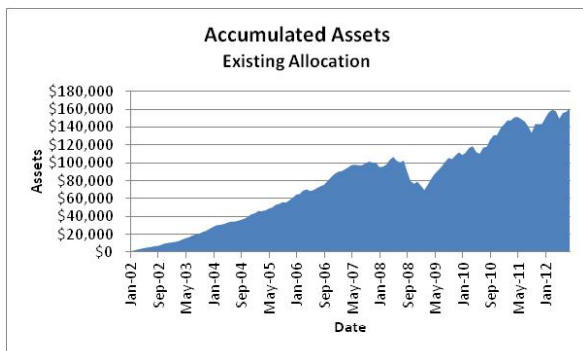
Member making \$100,000 in 2012 (adjusted for inflation in previous years)  
 Employee contributions of 5.5%  
 Employer contributions of 8.5%

**Terminal value: \$165,000**

**Drawdown: \$34,000**

**Assumptions:**

Member making \$100,000 in 2012 (adjusted for inflation in previous years)  
 Employee contributions of 5.5%  
 Employer contributions of 8.5%



# Accumulated Assets

**Terminal value: \$168,000**

**Drawdown: \$36,000**

**Assumptions:**

Member making \$100,000 in 2012 (adjusted for inflation in previous years)

Employee contributions of 5.5%

Employer contributions of 8.5%

**Terminal value: \$167,000**

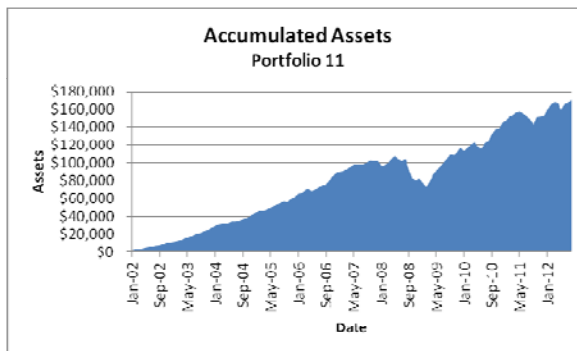
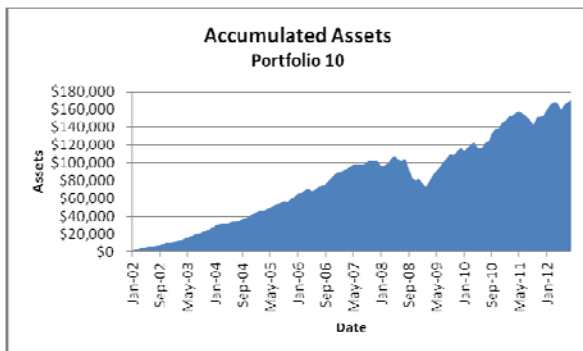
**Drawdown: \$36,000**

**Assumptions:**

Member making \$100,000 in 2012 (adjusted for inflation in previous years)

Employee contributions of 5.5%

Employer contributions of 8.5%



# Accumulated Assets

**Terminal value: \$166,000**

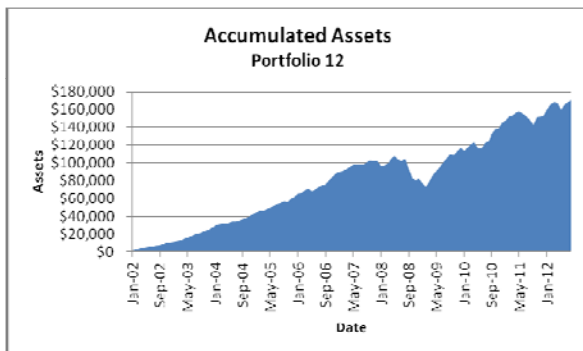
**Drawdown: \$37,000**

**Assumptions:**

Member making \$100,000 in 2012 (adjusted for inflation in previous years)

Employee contributions of 5.5%

Employer contributions of 8.5%



## Results – Historical Manager Returns (January 2007 – August 2012)

Portfolio	Expected Return	Volatility	Sharpe Ratio	Description
Existing Portfolio	-1.47%	14.66%	-0.226	Existing Diversified Equity Fund
Portfolio 9	-0.46%	13.16%	-0.176	Reducing allocation to EAFE equity, adding global small cap equity, adding global low volatility equity
Portfolio 10	0.10%	13.67%	-0.128	Reducing allocation to EAFE equity, replacing 50% of U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity
Portfolio 11	0.37%	13.94%	-0.106	Reducing allocation to EAFE equity, replacing 50% of U.S. equity with U.S. low volatility equity, adding emerging markets equity
Portfolio 12	-0.17%	13.88%	-0.146	Reducing allocation to EAFE equity, adding low-volatility equity to Canadian equity component, adding emerging markets equity, adding global small cap equity

# Historical Manager Returns – Performance

(As of August 31, 2012, except for calendar year results)

	Returns										
	2007-2012 5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	
Existing Portfolio	-1.47%	-2.23%	-0.79%	4.31%	5.34%	4.12%	-7.99%	10.34%	23.55%	-31.66%	1.46%
Portfolio 9	-0.46%	-1.06%	-0.04%	5.18%	<b>5.93%</b>	4.43%	<b>-6.36%</b>	10.81%	21.69%	<b>-28.56%</b>	2.01%
Portfolio 10	0.10%	-0.64%	0.31%	5.26%	5.70%	3.95%	-6.98%	<b>11.25%</b>	24.96%	-29.42%	4.25%
Portfolio 11	<b>0.37%</b>	<b>-0.40%</b>	<b>0.85%</b>	<b>5.32%</b>	5.83%	<b>4.85%</b>	-6.88%	11.07%	<b>26.37%</b>	-29.32%	<b>4.30%</b>
Portfolio 12	-0.17%	-0.87%	0.23%	5.23%	5.76%	3.87%	-6.95%	11.05%	25.34%	-30.11%	3.50%

# Historical Manager Returns – Standard Deviation

(As of August 31, 2012, except for calendar year results)

	Volatility										
	2007-2012 5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	
Existing Portfolio	14.66%	15.54%	16.75%	12.32%	12.72%	14.34%	12.50%	13.60%	17.10%	19.10%	4.99%
Portfolio 9	<b>13.16%</b>	<b>13.96%</b>	<b>15.13%</b>	<b>10.90%</b>	<b>11.19%</b>	<b>12.76%</b>	<b>10.80%</b>	<b>12.23%</b>	<b>15.59%</b>	<b>17.23%</b>	<b>4.22%</b>
Portfolio 10	13.67%	14.51%	15.72%	11.32%	11.66%	13.43%	11.26%	12.61%	16.09%	17.78%	4.67%
Portfolio 11	13.94%	14.79%	16.02%	11.59%	11.92%	13.67%	11.57%	12.87%	16.73%	17.75%	4.82%
Portfolio 12	13.88%	14.73%	15.96%	11.61%	11.94%	13.83%	11.50%	12.95%	16.10%	17.96%	4.75%

# Historical Manager Returns – Sharpe Ratio

(As of August 31, 2012, except for calendar year results)

	Sharpe Ratio										
	2007-2012 5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	
Existing Portfolio	-0.226	-0.240	-0.104	0.288	0.346	0.222	-0.718	0.720	1.340	-1.832	-0.595
Portfolio 9	-0.176	-0.183	-0.066	<b>0.406</b>	<b>0.445</b>	0.274	-0.681	0.838	1.351	-1.850	-0.572
Portfolio 10	-0.128	-0.148	-0.042	0.397	0.408	0.224	-0.708	<b>0.849</b>	1.512	-1.842	-0.037
Portfolio 11	<b>-0.106</b>	<b>-0.129</b>	<b>-0.007</b>	0.393	0.410	<b>0.286</b>	<b>-0.681</b>	0.817	<b>1.539</b>	-1.839	<b>-0.026</b>
Portfolio 12	-0.146	-0.161	-0.046	0.385	0.403	0.212	-0.691	0.811	1.535	-1.862	-0.195

## Results – Historical Index Returns (January 2002 – August 2012)

Portfolio	Expected Return	Volatility	Sharpe Ratio	Description
Existing Portfolio	3.25%	12.98%	0.072	Existing Diversified Equity Fund
Portfolio 9	3.53%	12.28%	0.099	Reducing allocation to EAFE equity, adding global small cap equity, adding global low volatility equity
Portfolio 10	3.89%	12.60%	0.125	Reducing allocation to EAFE equity, replacing 50% of U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity
Portfolio 11	3.69%	12.50%	0.110	Reducing allocation to EAFE equity, replacing 50% of U.S. equity with U.S. low volatility equity, adding emerging markets equity
Portfolio 12	3.82%	12.79%	0.117	Reducing allocation to EAFE equity, adding low-volatility equity to Canadian equity component, adding emerging markets equity, adding global small cap equity



# Historical Index Returns – Performance

(As of August 31, 2012, except for calendar year results)

	Returns																
	2002-2012	10-Yr	5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Existing Portfolio	3.25%	5.19%	-1.86%	-0.44%	5.33%	6.37%	4.38%	-5.74%	10.72%	21.78%	-31.34%	0.50%	<b>20.27%</b>	12.51%	11.80%	20.90%	-17.02%
Portfolio 9	3.53%	5.48%	-1.07%	0.40%	6.22%	<b>7.09%</b>	<b>5.33%</b>	<b>-4.12%</b>	11.39%	20.74%	<b>-29.51%</b>	-0.27%	19.97%	12.38%	11.89%	20.09%	-16.68%
Portfolio 10	<b>3.89%</b>	<b>5.78%</b>	<b>-0.94%</b>	<b>0.57%</b>	<b>6.29%</b>	6.90%	4.86%	-4.59%	<b>11.74%</b>	<b>23.48%</b>	-30.87%	1.49%	19.79%	<b>13.59%</b>	<b>12.09%</b>	20.59%	<b>-16.24%</b>
Portfolio 11	3.69%	5.59%	-1.05%	0.41%	6.13%	6.81%	4.94%	-4.40%	11.08%	22.95%	-30.87%	<b>1.92%</b>	19.98%	13.25%	11.63%	19.62%	-16.45%
Portfolio 12	3.82%	5.71%	-1.26%	0.40%	6.26%	6.99%	4.99%	-4.64%	11.52%	23.40%	-31.73%	1.11%	20.05%	13.41%	12.08%	<b>21.76%</b>	<b>-16.24%</b>

# Historical Index Returns – Standard Deviation

(As of August 31, 2012, except for calendar year results)

	Volatility																
	2002-2012	10-Yr	5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Existing Portfolio	12.98%	12.91%	15.28%	16.33%	11.61%	11.66%	12.96%	11.36%	13.26%	17.23%	19.67%	4.70%	8.94%	7.73%	7.45%	11.87%	15.40%
Portfolio 9	<b>12.28%</b>	<b>12.18%</b>	<b>14.27%</b>	<b>15.22%</b>	10.55%	10.46%	11.55%	10.11%	12.18%	<b>16.42%</b>	18.56%	<b>4.50%</b>	<b>8.76%</b>	<b>7.55%</b>	7.31%	<b>11.37%</b>	14.83%
Portfolio 10	12.60%	12.53%	14.76%	15.73%	10.90%	10.83%	12.05%	10.49%	12.52%	16.82%	19.09%	4.80%	9.01%	7.92%	7.45%	11.54%	<b>14.83%</b>
Portfolio 11	12.50%	12.42%	14.61%	15.56%	<b>10.80%</b>	<b>10.71%</b>	<b>11.91%</b>	<b>10.32%</b>	<b>12.49%</b>	16.64%	<b>18.96%</b>	4.65%	8.78%	7.81%	7.30%	11.51%	14.98%
Portfolio 12	12.79%	12.72%	15.00%	15.97%	11.17%	11.11%	12.45%	10.72%	12.86%	16.79%	19.40%	4.85%	9.08%	8.04%	<b>7.21%</b>	11.59%	15.24%

# Historical Index Returns – Sharpe Ratio

(As of August 31, 2012, except for calendar year results)

	Sharpe Ratio													2004	2003	2002	
	2002-2012	10-Yr	5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	2006				2005
Existing Portfolio	0.072	0.222	-0.220	-0.086	0.394	0.465	0.265	-0.593	0.767	1.228	-1.762	-0.835	1.821	1.283	1.278	1.522	-1.271
Portfolio 9	0.099	0.259	-0.180	-0.037	<b>0.518</b>	<b>0.587</b>	<b>0.381</b>	-0.506	0.890	1.225	-1.770	-1.044	<b>1.823</b>	1.295	1.315	1.518	-1.298
Portfolio 10	<b>0.125</b>	<b>0.275</b>	<b>-0.165</b>	<b>-0.025</b>	0.508	0.550	0.325	-0.532	<b>0.894</b>	<b>1.359</b>	-1.792	-0.612	1.754	<b>1.386</b>	1.317	1.539	-1.268
Portfolio 11	0.110	0.263	-0.174	-0.036	0.498	0.548	0.336	<b>-0.523</b>	0.843	1.342	-1.814	<b>-0.540</b>	1.819	1.363	1.281	1.459	-1.269
Portfolio 12	0.117	0.266	-0.184	-0.035	0.493	0.544	0.326	-0.526	0.853	1.357	-1.807	-0.685	1.768	1.346	<b>1.359</b>	<b>1.634</b>	<b>-1.234</b>

## Results – Mean/Variance Optimization

Portfolio	Expected Return	Volatility	Sharpe Ratio	Canada Equity	US Equity	EAFE Equity	Emerging Markets Equity	Global Equity	Global Small Cap	Global Commodities	Canadian Low Vol	U.S. Low Vol	Global Low Vol	Description
Existing Portfolio	6.74%	18.12%	0.239	30.0%	22.5%	30.0%	0.0%	17.5%	0.0%	0.0%	0.0%	0.0%	0.0%	Existing Diversified Equity Fund asset mix
Portfolio 9	6.70%	18.05%	0.238	30.0%	20.0%	16.0%	0.0%	20.0%	5.0%	0.0%	0.0%	0.0%	9.0%	Reducing allocation to EAFE equity, adding global small cap equity, adding global low volatility equity
Portfolio 10	6.74%	18.14%	0.239	30.0%	10.0%	16.0%	5.0%	24.0%	5.0%	0.0%	0.0%	10.0%	0.0%	Reducing allocation to EAFE equity, replacing 50% of U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity
Portfolio 11	6.73%	17.97%	0.241	30.0%	10.0%	16.0%	5.0%	29.0%	0.0%	0.0%	0.0%	10.0%	0.0%	Reducing allocation to EAFE equity, replacing 50% of U.S. equity with U.S. low volatility equity, adding emerging markets equity
Portfolio 12	6.77%	18.45%	0.237	22.5%	20.0%	16.0%	5.0%	24.0%	5.0%	0.0%	7.5%	0.0%	0.0%	Reducing allocation to EAFE equity, adding low-volatility equity to Canadian equity component, adding emerging markets equity, adding global small cap equity

# Fees

## Fee Estimates

### Assumptions:

- Emerging markets:  
Management fees ranging from 0.75% to 1.25%: assumed 1.00%
- Global small cap:  
Management fees ranging from 0.60% to 1.10%: assumed 0.85%
- Low volatility equity:  
For Canadian, U.S. and global low volatility equity: assumed the fee schedule of the low volatility strategies of an index provider. 0.20% on first \$20 MM, 0.10% on next \$80 MM and 0.07% above \$100 MM.

Portfolio	Estimated Management Fees <sup>1</sup>
Existing Portfolio	0.46%
Portfolio 9	0.46%
Portfolio 10	0.53%
Portfolio 11	0.52%
Portfolio 12	0.51%

<sup>1</sup> Includes HST but excludes custodian fees.

# Implementation

# Implementation

Tasks	Timeline
Optimize asset mix	November 2012
Manager search	November 2012 - January 2012
Fund approval	February 2013



# Appendix

## Assumptions – Mean/Variance Optimization

	Canada Equity	US Equity	EAFE Equity	Emerging Markets Equity	Global Equity	Global Small Cap	Global Commodities	Canadian Low Vol	U.S. Low Vol	Global Low Vol
10-Yr Return	6.40%	6.90%	6.80%	8.00%	7.00%	7.30%	4.30%	5.60%	6.00%	6.08%
10-Yr Volatility	18.30%	22.10%	19.90%	29.00%	20.20%	23.70%	19.40%	14.64%	17.68%	16.16%

### Correlation Matrix

	Canada Equity	US Equity	EAFE Equity	Emerging Markets Equity	Global Equity	Global Small Cap	Global Commodities	Canadian Low Vol	U.S. Low Vol	Global Low Vol
<b>Canada Equity</b>	1.00									
<b>US Equity</b>	0.61	1.00								
<b>EAFE Equity</b>	0.72	0.76	1.00							
<b>Emerging Markets Equity</b>	0.61	0.74	0.74	1.00						
<b>Global Equity</b>	0.72	0.95	0.91	0.86	1.00					
<b>Global Small Cap</b>	0.72	0.95	0.91	0.86	1.00	1.00				
<b>Global Commodities</b>	0.36	0.53	0.42	0.52	0.54	0.54	1.00			
<b>Canadian Low Vol</b>	1.00	0.61	0.72	0.61	0.72	0.72	0.36	1.00		
<b>U.S. Low Vol</b>	0.61	1.00	0.76	0.74	0.95	0.95	0.53	0.61	1.00	
<b>Global Low Vol</b>	0.72	0.95	0.91	0.86	1.00	1.00	0.54	0.72	0.95	1.00

# Assumptions – Historical Index Returns

(As of August 31, 2012)

	S&P/TSX	Small Cap	S&P 500 Hedged	S&P 500 Unhedged	S&P Midcap 400	Russell 2000	MSCI EAFE	Emerging Markets	MSCI World	MSCI ACWI	MSCI World Small Cap	Global Commodities	MSCI Canada Low Vol	MSCI U.S. Low Vol USD	MSCI U.S. Low Vol CAD	MSCI World Low Vol CAD	MSCI ACWI Low Vol CAD
10-Yr return	8.74%	5.46%	5.62%	1.71%	8.32%	4.12%	2.37%	10.19%	2.18%	2.75%	5.75%	0.69%	9.89%	7.13%	2.33%	3.79%	5.51%
10-Yr standard deviation	14.27%	19.22%	15.87%	12.24%	18.56%	16.62%	14.01%	18.85%	12.38%	12.63%	14.87%	14.65%	11.24%	12.00%	10.24%	9.21%	8.99%
<b>Correlations</b>																	
S&P/TSX	1.00	0.89	0.80	0.51	0.83	0.59	0.66	0.78	0.64	0.69	0.72	0.46	0.95	0.72	0.25	0.35	0.34
Small Cap	0.89	1.00	0.70	0.40	0.79	0.54	0.61	0.76	0.56	0.61	0.70	0.48	0.82	0.62	0.15	0.27	0.27
S&P 500 Hedged	0.80	0.70	1.00	0.76	0.94	0.75	0.77	0.74	0.81	0.84	0.80	0.14	0.72	0.94	0.48	0.49	0.47
S&P 500 Unhedged	0.51	0.40	0.76	1.00	0.68	0.86	0.82	0.62	0.94	0.93	0.83	0.08	0.47	0.72	0.86	0.82	0.82
S&P Midcap 400	0.83	0.79	0.94	0.68	1.00	0.81	0.71	0.75	0.74	0.77	0.84	0.19	0.75	0.87	0.39	0.40	0.38
Russell 2000	0.59	0.54	0.75	0.86	0.81	1.00	0.72	0.63	0.81	0.82	0.91	0.07	0.52	0.70	0.69	0.65	0.65
EAFE	0.66	0.61	0.77	0.82	0.71	0.72	1.00	0.82	0.96	0.96	0.88	0.26	0.61	0.71	0.62	0.75	0.77
Emerging Markets	0.78	0.76	0.74	0.62	0.75	0.63	0.82	1.00	0.78	0.83	0.80	0.32	0.72	0.66	0.38	0.51	0.54
MSCI World	0.64	0.56	0.81	0.94	0.74	0.81	0.96	0.78	1.00	0.99	0.90	0.21	0.59	0.74	0.75	0.80	0.81
MSCI ACWI	0.69	0.61	0.84	0.93	0.77	0.82	0.96	0.83	0.99	1.00	0.92	0.22	0.63	0.77	0.72	0.79	0.80
MSCI World Small Cap	0.72	0.70	0.80	0.83	0.84	0.91	0.88	0.80	0.90	0.92	1.00	0.22	0.66	0.73	0.62	0.69	0.69
Global Commodities	0.46	0.48	0.14	0.08	0.19	0.07	0.26	0.32	0.21	0.22	0.22	1.00	0.42	0.09	0.00	0.10	0.12
MSCI Canada Low Vol	0.95	0.82	0.72	0.47	0.75	0.52	0.61	0.62	0.59	0.63	0.66	0.42	1.00	0.71	0.29	0.41	0.39
MSCI U.S. Low Vol USD	0.72	0.62	0.94	0.72	0.87	0.70	0.71	0.66	0.74	0.77	0.73	0.09	0.71	1.00	0.60	0.58	0.54
MSCI U.S. Low Vol CAD	0.25	0.15	0.48	0.86	0.39	0.69	0.62	0.38	0.75	0.72	0.62	0.00	0.29	0.60	1.00	0.92	0.90
MSCI World Low Vol CAD	0.35	0.27	0.49	0.82	0.40	0.65	0.75	0.51	0.80	0.79	0.69	0.10	0.41	0.58	0.92	1.00	0.98
MSCI ACWI Low Vol CAD	0.34	0.27	0.47	0.82	0.38	0.65	0.77	0.54	0.81	0.80	0.69	0.12	0.39	0.54	0.90	0.98	1.00

## Results – Mean/Variance Optimization

Portfolio	Expected Return	Volatility	Sharpe Ratio	Canada Equity	US Equity	EAFE Equity	Emerging Markets Equity	Global Equity	Global Small Cap	Global Commodities	Canadian Low Vol	U.S. Low Vol	Global Low Vol	Description
Existing Portfolio	6.74%	18.12%	0.239	30.0%	22.5%	30.0%	0.0%	17.5%	0.0%	0.0%	0.0%	0.0%	0.0%	Existing Diversified Equity Fund asset mix
Portfolio 1	6.76%	18.35%	0.238	30.0%	22.5%	25.0%	0.0%	17.5%	5.0%	0.0%	0.0%	0.0%	0.0%	Adding global small cap equity
Portfolio 2	6.80%	18.38%	0.239	30.0%	22.5%	25.0%	5.0%	17.5%	0.0%	0.0%	0.0%	0.0%	0.0%	Adding emerging markets equity
Portfolio 3	6.68%	17.89%	0.239	22.5%	22.5%	30.0%	0.0%	17.5%	0.0%	0.0%	7.5%	0.0%	0.0%	Adding Canadian low volatility equity
Portfolio 4	6.67%	17.77%	0.240	30.0%	22.5%	30.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	7.5%	Adding Global low volatility equity
Portfolio 5	6.66%	17.72%	0.241	30.0%	15.0%	30.0%	0.0%	17.5%	0.0%	0.0%	0.0%	7.5%	0.0%	Adding U.S. equity low volatility
Portfolio 6	6.54%	17.41%	0.237	30.0%	22.5%	30.0%	0.0%	10.0%	0.0%	7.5%	0.0%	0.0%	0.0%	Adding global commodities
Portfolio 7	6.64%	17.60%	0.241	30.0%	0.0%	16.0%	5.0%	24.0%	5.0%	0.0%	0.0%	20.0%	0.0%	Reducing allocation to EAFE equity, replacing U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity

## Results – Historical Manager Returns (January 2007 – August 2012)

Portfolio	Expected Return	Volatility	Sharpe Ratio	Description
Existing Portfolio	-1.47%	14.66%	-0.226	Existing Diversified Equity Fund
Portfolio 1	-1.24%	14.26%	-0.217	Adding global small cap equity
Portfolio 2	-1.05%	14.80%	-0.196	Adding emerging markets equity
Portfolio 3	-1.29%	14.35%	-0.219	Adding Canadian low volatility equity
Portfolio 4	-1.59%	14.15%	-0.243	Adding Global low volatility equity
Portfolio 5	-1.13%	14.26%	-0.209	Adding U.S. equity low volatility
Portfolio 6	-1.42%	14.60%	-0.224	Adding global commodities
Portfolio 7	0.55%	13.16%	-0.099	Reducing allocation to EAFE equity, replacing U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity
Portfolio 8	0.54%	13.30%	-0.099	Adding Canadian small cap equity, reducing allocation to EAFE equity, replacing U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity

# Historical Manager Returns – Performance

(As of August 31, 2012, except for calendar year results)

	Returns										
	2007-2012 5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	
Existing Portfolio	-1.47%	-2.23%	-0.79%	4.31%	5.34%	4.12%	-7.99%	10.34%	23.55%	-31.66%	1.46%
Portfolio 1	-1.24%	-1.93%	-0.84%	4.58%	5.52%	3.65%	-7.86%	10.87%	22.93%	-30.95%	1.68%
Portfolio 2	-1.05%	-1.88%	-0.42%	4.65%	5.30%	3.95%	-8.14%	10.96%	<b>25.40%</b>	-32.11%	2.62%
Portfolio 3	-1.29%	-1.96%	-0.44%	4.60%	5.64%	4.30%	-6.98%	10.23%	23.20%	-31.11%	1.10%
Portfolio 4	-1.59%	-2.28%	-0.76%	4.70%	5.79%	<b>4.59%</b>	-6.59%	10.32%	21.28%	-31.42%	0.85%
Portfolio 5	-1.13%	-1.85%	-0.47%	4.55%	5.52%	4.32%	-7.25%	10.41%	23.00%	-30.73%	1.74%
Portfolio 6	-1.42%	-2.25%	-0.78%	4.80%	5.53%	3.69%	-7.06%	10.94%	23.38%	-32.54%	1.95%
Portfolio 7	<b>0.55%</b>	-0.14%	0.73%	5.56%	<b>5.93%</b>	4.20%	<b>-6.01%</b>	11.34%	24.23%	<b>-28.15%</b>	<b>4.64%</b>
Portfolio 8	0.54%	<b>-0.11%</b>	<b>0.83%</b>	<b>5.73%</b>	5.87%	3.84%	-6.21%	<b>11.82%</b>	25.08%	-28.47%	4.33%

# Historical Manager Returns – Standard Deviation

(As of August 31, 2012, except for calendar year results)

	Volatility										
	2007-2012 5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	
Existing Portfolio	14.66%	15.54%	16.75%	12.32%	12.72%	14.34%	12.50%	13.60%	17.10%	19.10%	4.99%
Portfolio 1	14.26%	15.13%	16.37%	12.02%	12.42%	14.15%	12.17%	13.33%	16.41%	18.72%	4.77%
Portfolio 2	14.80%	15.70%	16.89%	12.34%	12.74%	14.56%	12.54%	13.51%	17.09%	19.45%	5.16%
Portfolio 3	14.35%	15.21%	16.39%	11.98%	12.29%	13.83%	11.95%	13.36%	16.94%	18.64%	4.93%
Portfolio 4	14.15%	15.00%	16.07%	11.52%	11.77%	13.14%	11.53%	12.84%	16.77%	18.94%	4.94%
Portfolio 5	14.26%	15.12%	16.29%	11.85%	12.18%	13.66%	11.90%	13.16%	16.99%	18.59%	4.88%
Portfolio 6	14.60%	15.47%	16.55%	11.94%	12.15%	13.76%	11.95%	13.21%	16.85%	19.57%	5.61%
Portfolio 7	<b>13.16%</b>	<b>13.97%</b>	<b>15.14%</b>	<b>10.71%</b>	<b>10.97%</b>	<b>12.52%</b>	<b>10.49%</b>	<b>12.05%</b>	15.94%	<b>17.13%</b>	<b>4.53%</b>
Portfolio 8	13.30%	14.11%	15.30%	10.84%	11.14%	12.75%	10.67%	12.09%	<b>15.92%</b>	17.40%	4.63%

# Historical Manager Returns – Sharpe Ratio

(As of August 31, 2012, except for calendar year results)

	Sharpe Ratio										
	2007-2012 5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	
Existing Portfolio	-0.226	-0.240	-0.104	0.288	0.346	0.222	-0.718	0.720	1.340	-1.832	-0.595
Portfolio 1	-0.217	-0.227	-0.110	0.318	0.368	0.191	-0.727	0.775	1.359	-1.831	-0.576
Portfolio 2	-0.196	-0.216	-0.082	0.315	0.342	0.207	-0.728	0.770	1.450	-1.822	-0.351
Portfolio 3	-0.219	-0.228	-0.086	0.321	0.382	0.243	-0.667	0.725	1.332	-1.848	-0.676
Portfolio 4	-0.243	-0.253	-0.107	0.342	0.411	0.278	-0.658	0.761	1.232	-1.834	-0.724
Portfolio 5	-0.209	-0.222	-0.088	0.320	0.376	0.247	-0.693	0.749	1.318	-1.832	-0.551
Portfolio 6	-0.224	-0.243	-0.106	0.339	0.377	0.200	-0.674	0.787	1.351	-1.833	-0.441
Portfolio 7	-0.099	-0.117	-0.015	0.449	0.454	0.261	-0.668	0.895	1.481	-1.838	0.046
Portfolio 8	-0.099	-0.114	-0.009	0.458	0.442	0.228	-0.675	0.932	1.536	-1.828	-0.021



## Results – Historical Index Returns (January 2002 – August 2012)

Portfolio	Expected Return	Volatility	Sharpe Ratio	Description
Existing Portfolio	3.25%	12.98%	0.072	Existing Diversified Equity Fund
Portfolio 1	3.41%	13.02%	0.084	Adding global small cap equity
Portfolio 2	3.66%	13.15%	0.102	Adding emerging markets equity
Portfolio 3	3.41%	12.74%	0.086	Adding Canadian low volatility equity
Portfolio 4	3.48%	12.57%	0.092	Adding Global low volatility equity
Portfolio 5	3.42%	12.65%	0.087	Adding U.S. equity low volatility
Portfolio 6	3.47%	12.50%	0.092	Adding global commodities
Portfolio 7	4.12%	12.18%	0.148	Reducing allocation to EAFE equity, replacing U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity
Portfolio 8	4.08%	12.25%	0.144	Adding Canadian small cap equity, reducing allocation to EAFE equity, replacing U.S. equity with U.S. low volatility equity, adding emerging markets equity, adding global small cap equity

# Historical Index Returns – Performance

(As of August 31, 2012, except for calendar year results)

	Returns																
	2002-2012	10-Yr	5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Existing Portfolio	3.25%	5.19%	-1.86%	-0.44%	5.33%	6.37%	4.38%	-5.74%	10.72%	21.78%	-31.34%	0.50%	20.27%	12.51%	11.80%	20.90%	-17.02%
Portfolio 1	3.41%	5.36%	-1.60%	-0.13%	5.75%	6.75%	4.65%	-5.59%	11.59%	22.33%	-31.26%	0.01%	19.77%	12.65%	12.00%	<b>21.64%</b>	-17.00%
Portfolio 2	3.66%	5.59%	-1.63%	-0.22%	5.54%	6.20%	4.07%	-6.08%	11.25%	<b>23.64%</b>	-31.99%	<b>1.66%</b>	<b>20.53%</b>	13.51%	12.07%	21.57%	-16.55%
Portfolio 3	3.41%	5.27%	-1.71%	-0.16%	5.60%	6.70%	4.76%	-4.79%	10.58%	21.11%	-30.99%	0.28%	20.31%	12.52%	12.03%	20.95%	-16.39%
Portfolio 4	3.48%	5.34%	-1.51%	-0.13%	5.62%	6.64%	4.71%	-4.75%	10.79%	20.66%	-30.29%	0.40%	20.16%	12.47%	12.18%	20.38%	-16.16%
Portfolio 5	3.42%	5.30%	-1.51%	-0.10%	5.55%	6.55%	4.56%	-4.98%	10.78%	21.34%	-30.43%	0.62%	20.10%	12.65%	11.99%	20.07%	-16.55%
Portfolio 6	3.47%	5.16%	-1.81%	-0.96%	5.14%	6.00%	2.91%	-6.32%	11.09%	20.87%	-30.69%	0.94%	18.79%	13.42%	11.44%	20.24%	<b>-14.00%</b>
Portfolio 7	<b>4.12%</b>	<b>5.92%</b>	<b>-0.47%</b>	1.03%	6.59%	<b>7.12%</b>	<b>5.09%</b>	<b>-3.57%</b>	11.82%	22.88%	<b>-29.66%</b>	1.65%	19.56%	<b>13.77%</b>	<b>12.34%</b>	19.49%	-15.61%
Portfolio 8	4.08%	5.84%	-0.49%	<b>1.10%</b>	<b>6.75%</b>	7.07%	4.81%	-3.81%	<b>12.29%</b>	23.59%	-30.06%	1.41%	19.40%	13.38%	12.10%	19.70%	-15.35%

# Historical Index Returns – Standard Deviation

(As of August 31, 2012, except for calendar year results)

	Volatility																
	2002-2012	10-Yr	5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Existing Portfolio	12.98%	12.91%	15.28%	16.33%	11.61%	11.66%	12.96%	11.36%	13.26%	17.23%	19.67%	4.70%	8.94%	7.73%	7.45%	11.87%	15.40%
Portfolio 1	13.02%	12.94%	15.33%	16.39%	11.63%	11.66%	12.95%	11.44%	13.24%	17.29%	19.78%	4.86%	9.09%	7.81%	7.58%	11.81%	15.33%
Portfolio 2	13.15%	13.09%	15.47%	16.51%	11.66%	11.74%	13.23%	11.46%	13.18%	17.22%	20.07%	4.81%	9.29%	8.23%	7.56%	11.90%	15.48%
Portfolio 3	12.74%	12.66%	14.97%	15.96%	11.29%	11.28%	12.48%	10.86%	13.04%	17.01%	19.23%	4.67%	8.84%	7.61%	7.13%	11.75%	15.15%
Portfolio 4	12.57%	12.50%	14.75%	15.76%	10.99%	10.96%	12.13%	10.63%	12.60%	17.01%	19.13%	4.65%	8.83%	7.58%	7.35%	11.58%	14.85%
Portfolio 5	12.65%	12.58%	14.86%	15.87%	11.16%	11.16%	12.30%	10.81%	12.84%	17.09%	19.10%	4.65%	<b>8.81%</b>	<b>7.55%</b>	7.38%	11.75%	<b>14.91%</b>
Portfolio 6	12.50%	12.45%	14.89%	16.04%	11.40%	11.56%	13.02%	11.17%	13.01%	<b>16.41%</b>	19.31%	<b>4.43%</b>	8.93%	7.76%	<b>6.89%</b>	<b>11.25%</b>	14.13%
Portfolio 7	<b>12.18%</b>	<b>12.10%</b>	<b>14.21%</b>	<b>15.13%</b>	<b>10.33%</b>	<b>10.18%</b>	<b>11.18%</b>	<b>9.79%</b>	<b>11.98%</b>	16.63%	<b>18.33%</b>	4.73%	8.85%	7.71%	7.38%	11.37%	14.20%
Portfolio 8	12.25%	12.18%	14.35%	15.29%	10.45%	10.35%	11.41%	9.98%	12.02%	16.59%	18.58%	4.81%	8.62%	7.84%	7.44%	11.45%	<b>14.07%</b>

# Historical Index Returns – Sharpe Ratio

(As of August 31, 2012, except for calendar year results)

	Sharpe Ratio													2004	2003	2002	
	2002-2012	10-Yr	5-Yr	4-Yr	3-Yr	2-Yr	1-Yr	2011	2010	2009	2008	2007	2006				2005
Existing Portfolio	0.072	0.222	-0.220	-0.086	0.394	0.465	0.265	-0.593	0.767	1.228	-1.762	-0.835	1.821	1.283	1.278	1.522	-1.271
Portfolio 1	0.084	0.234	-0.202	-0.066	0.430	0.498	0.286	-0.575	0.833	1.255	<b>-1.749</b>	-0.907	1.736	1.287	1.283	<b>1.592</b>	-1.276
Portfolio 2	0.102	0.250	-0.202	-0.071	0.411	0.448	0.237	-0.617	0.812	1.337	-1.760	<b>-0.574</b>	1.780	1.325	1.294	1.575	-1.234
Portfolio 3	0.086	0.233	-0.214	-0.070	0.429	0.510	0.306	-0.532	0.769	1.205	-1.785	-0.890	1.846	1.305	1.366	1.542	-1.250
Portfolio 4	0.092	0.241	-0.204	-0.070	0.443	0.519	0.311	-0.541	0.813	1.178	-1.757	-0.866	<b>1.830</b>	1.302	1.347	1.515	-1.261
Portfolio 5	0.087	0.237	-0.202	-0.067	0.430	0.502	0.294	-0.553	0.797	1.212	-1.767	-0.818	1.828	1.330	1.315	1.467	-1.282
Portfolio 6	0.092	0.227	-0.222	-0.120	0.385	0.437	0.152	-0.655	0.810	1.234	-1.761	-0.785	1.657	1.394	1.330	1.548	<b>-1.172</b>
Portfolio 7	<b>0.148</b>	<b>0.297</b>	-0.139	0.004	0.565	0.607	<b>0.371</b>	<b>-0.467</b>	0.941	1.338	-1.799	-0.588	1.760	<b>1.448</b>	<b>1.363</b>	1.465	-1.280
Portfolio 8	0.144	0.289	<b>-0.139</b>	0.009	<b>0.574</b>	0.592	0.339	-0.482	<b>0.977</b>	<b>1.384</b>	-1.797	-0.628	1.746	1.375	1.319	1.474	-1.273



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