

## What Money Can't Buy

People are also quick to tell you that money can't buy the emotional payoffs in life, but a perusal of our society reveals contradictions.

People say that money can't buy self-esteem and self-fulfillment, yet many say money makes them feel successful and affords them the opportunity to pursue the goals that will give them self-fulfillment.

People say that money can't buy family togetherness, but how many people wish they had more money for the simple reason that they could have more time with their family? Lack of time with people they care about is one of the greatest stressors in our society today.

People say that money can't buy good health, but have you ever had to make a living arrangement for an aging relative? Once you do, you quickly realize the importance of the relationship between money and the quality of health care.

Finally, people say that money can't buy peace of mind. But those with adequate financial resources can pay high fees for psychologists, career coaches, and other contentment gurus, which they hope will help liberate them from the stress, pressures, and constraints in their lives.

I do not mean to imply that there is no truth in the idea that money can't buy love or health or quality relationships. I do believe, however, that many people simply pay lip service to these ideas and deep down believe that somehow, some way, money will answer all.

## A PRICE TAG

One inescapable and undeniable conclusion we can draw about people and money is that, for most, there is a constant wrestling match going on in their relationship with money. There will always be inconsistencies. There will always be uncertainty and tension between paradoxical truths.

People want plenty but do not do the things they should to get it. They say they don't want it, but deep down they yearn for it. They say they will be content when they reach their financial goals, and then they aren't. They can't fully decide if money is good or evil. They have seen some of the things that money can do—and they've seen some of the things the lack of money can do. Consequently, most people hold inner conflicts regarding money.

Although your clients may be somewhat ambivalent about what they expect from money, they are more likely to be decisive about what they expect from life. Whether they like it or not, there is a price tag attached to almost everything people want in life.

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## All Risks Are Not Created Equal

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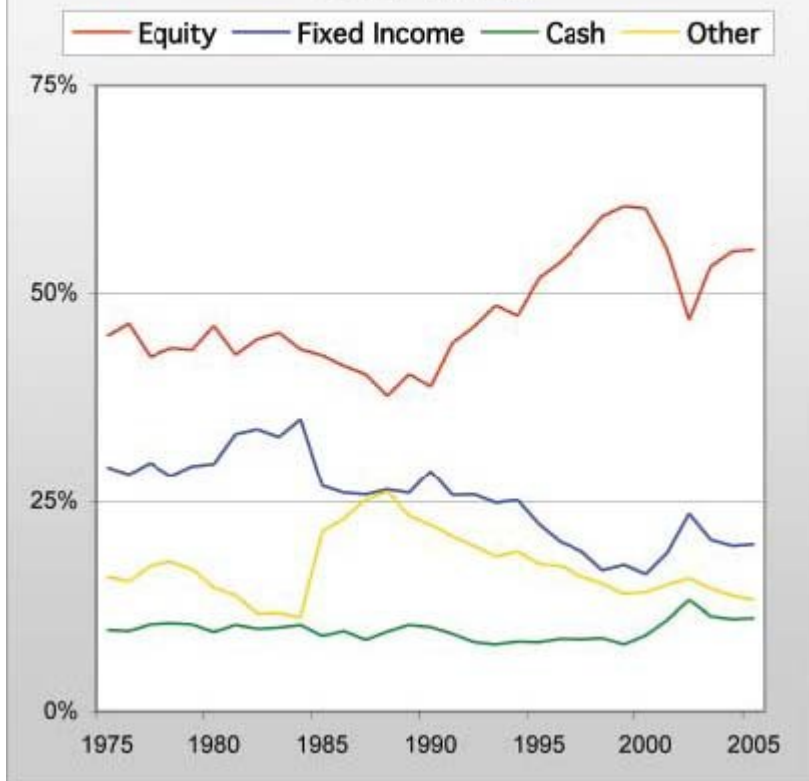
### *What use is knowledge if there is no understanding? – Stobaeus*

The perfect storm of falling equity prices and falling interest rates witnessed at the dawn of the new millennium revealed what can happen when market risk and interest rate risk work together against pension plans. Most financial professionals acknowledge that this scenario created a situation where diversification and downside protection failed. Justifications of insufficient investment strategies have led to submissions that there was “nothing that could have been done” to defend pension plans from the storm. Beneficiaries now face retirement losses due to unpredictable economic events which could not have been avoided. No matter what had been done prior to the arrival of the storm, it was impossible to avoid its path and devastation. Or was it?

In the theater of pension plan management, many characters are responsible for providing future retirement to employees. Government makes rules, actuaries build foundations, consultants offer solutions, and investment managers shoot for targets, while trustees oversee the process. All share part of the blame for the current pension crisis by ignoring tried and true strategies in favor of new wave solutions that promised larger returns and smaller contributions.

Even with 20/20 hindsight, few can offer a solution to avoid the pension crisis using traditional asset allocation changes. Short of drastic measures, such as moving 100% of the assets away from equity allocations into real

## Pension Asset Allocation 1975-2005



Federal Reserve, EBRI/ICI Survey1

estate, strategies that called for diversifying away volatility risk would have provided little to no protection. The goal of many plan investment strategies over the past 10 years was to produce a high return at minimum risk so as to minimize current contributions. Recently, a large Texas pension plan boasted of the highest returns in the state due to diversification of equities combined with allocations to real estate and hedge funds. Despite this success, however, the plan's underfunded liabilities rose 42%. Results such as these beg the question; is there something wrong with current measures of risk if lowering them does nothing to improve, or even sustain, the health of a plan?

There are three measures of risk that pension plan strategists seek to reduce; standard deviation, beta, and duration gap. Each adopts the term "risk" implying the possibility of suffering loss. In reality, none measure the chance of loss; they measure predictability. The assumption is that increased predictability provides a controlled investment environment which can prevent loss, but the past five years has proved that is not always the case.

Implementing a strategy with the potential to provide security for beneficiaries in retirement, demands that decision makers not just calculate the measure of risk, but fully grasp and interpret the results as to make better investment decisions. Diversification, hedging, and optimization are well understood within the

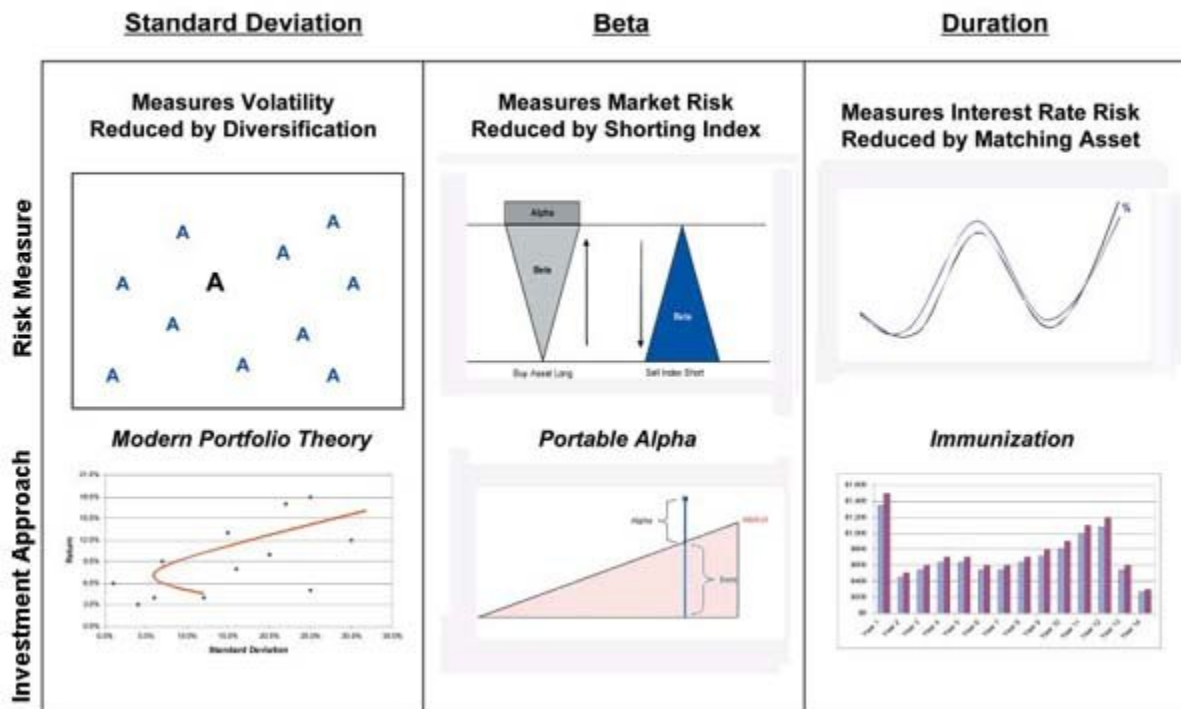
financial community and are popular buzzwords on many marketing sheets. Lost in the decorative attempts to use these tactics to minimize risk is the understanding that volatility is not the only factor in determining loss. Source:

The graphic below summarizes common methods used to reduce risk. Each type of risk is explained by demonstrating what it measures and how it can be reduced. An abstract pictorial of the risk measure and diagram of an associated investment approach are used for visualization.

### Standard Deviation

Standard deviation measures the volatility of returns and was the focus during the technology boom of the 1990s. The basis for modern portfolio theory is achieving greater returns with lower risk (standard deviation) by mixing assets with uncorrelated historical return patterns. Consistent, growing returns in the 1990's marketplace made theoretical models using optimization look like the Holy Grail for trustees. Analysis based on historical returns provided asset allocations that landed on efficient frontiers promising plan administrators they could make smaller contributions and increase benefits to their employees. It was an easy sell, as administrators bought into the sophisticated statistics while enjoying the opportunity to pass good news to their employers. But the perfect storm suggested that standard deviation was not the correct type of risk to reduce in order the secure pension plan obligations.

# Risk Reduction Methods



Assets' characteristics are still typically measured using standard deviation and total return. Standard deviation is especially useful because all investments have a computable return with varying volatility whether it is equities, bonds, real estate, or other alternatives. The following chart shows how historical standard deviations are used to homogenize asset classes in order to find an efficient portfolio. This common characteristic allows for comparison between very different types of securities.

## Optimization Inputs

End Date:	December-05
Start Date:	January-96
Return Calculation:	Arithmetic

Inputs	Expected Return	Standard Deviation
Riskless Rate	3.7%	0.0%
Lehman Int G/C	5.70%	3.22%
ML HY Master II	6.63%	7.22%
Russell 1000 Growth	8.48%	19.63%
Russell 1000 Value	11.48%	14.48%
Russell 2000 Core	10.94%	20.17%
Russell Mid Cap Core	13.17%	16.33%
MS EAFE	7.12%	14.88%
MS Emerging Markets	9.71%	23.81%
<b>Benchmark</b>		
Blend	8.25%	9.32%

Return and Standard Deviation are the common statistics used to compare asset classes ignoring more relevant risks such as duration and reinvestment risk.

Comparing bonds to other asset classes using standard deviation is similar to comparing different vehicles using miles per hour as the measurement. M.P.H. would easily determine whether a bicycle, car, airplane, or hot air balloon gets to the destination the fastest. Unfortunately, it ignores details such as cost, comfort, safety, entertainment, and most importantly, need. Surely an airplane would travel the fastest and may seem like the obvious answer, but what if the destination is 10 miles away? Most likely a car would be a better answer, unless of course the route takes you through downtown Washington, D.C. at 5:00pm on a Friday. Then a bicycle might be your best bet. To simplify asset allocation to one common statistic covering many different types of assets ignores each asset's fundamental makeup and the ability to satisfy a wide range of constantly changing liabilities.

Combinations of securities with different risk/return characteristics creates a hedge through diversification, lowering the risk and increasing probabilities of reaching the target goal. It ignores, however, factors such as interest rate, credit, political, exchange rate, liquidity, opportunity, and reinvestment risk, each of which may be extremely important over short and intermediate time periods. Over longer time periods, the short term cyclical market swings turn into historical averages that fulfill the concept of more return for less risk. But with long term returns being very hard to accurately predict and liabilities changing with interest rates and actuarial assumptions, matching for the long term must be monitored and updated regularly and be considered an ongoing process rather than a one time event.

### **Beta**

Beta measures the sensitivity of an investment to market movements. It is a narrower measurement of risk than standard deviation as beta represents risk relative to the market and is dependent upon the choice of benchmark. For example, if the investment is being compared to an index such as the Russell 1000 Value (benchmark beta is always 1.0) has a beta of 1.2, then it will be 1.2 times more volatile and considered more risky. Yet the same investment may have a beta of 0.8 versus the Russell 1000 Growth and considered less risky. Beta is also used with alpha in Modern Portfolio Theory through linear regression to find an optimal portfolio, but since beta represents the non-diversifiable risk, it is not targeted as a risk that should be reduced.

Alpha is the excess return over the market. It is a measure of how much better or worse an investment did over what it was expected to do. High alpha suggests strength and success. Since average performance can be achieved by investing in market indices, firms that manage money must justify fees by not only showing that they beat the index, but by how much. Alpha is the statistic used to satisfy this measurement.

The most important and often ignored factor behind the usefulness of alpha and beta is correlation. An

investment and the benchmark must have high correlation for these statistics to have meaning. In other words, the results are only relevant in comparing apples to apples. R-squared measures correlation and is expressed between 0.0 and 1.0. An R-squared of 0.75 or higher is generally considered an acceptable level in order for alpha and beta to have meaning. Otherwise the calculated beta has no significance and in turn alpha becomes irrelevant. Attempting to find conclusions with low correlation would be like calculating the volatility of a football team's weekly scoring over a season using a baseball league's scoring as the benchmark. Although the calculations will produce a result, the result will have no meaning.

The latest buzz word(s) in the investment management community is "portable alpha". This measure uses beta to gauge risk. It is the most recent concept for helping pension plans catch up to funded status. The purpose of portable alpha is to create a portfolio that removes the volatility of the markets and isolates an investment's excess return, or "alpha". Risk is reduced by "hedging" market risk using leverage and short sales. A short sale is typically done with a benchmarked index such as the S&P 500 or the Lehman Aggregate. The money saved by investing in derivatives is used towards the investment providing the alpha. Shorting the index removes the beta, or market risk, isolating the alpha. Hence, "risk" is reduced. But again, removing beta does not account for the specific risks of an individual plan's liabilities.

Not surprisingly, advisors have been bombarding the investment industry with sales and marketing campaigns that highlight portable alpha as the savior of pension plans. Trustees, desperate to return to fully funded status, are inclined to embrace a strategy that might breathe life back into their plans. Portable alpha, however, is a complex strategy that should be fully understood before being considered. Trustees need to know that applying a portable alpha strategy is in essence turning the pension plan into a hedge fund. Many plans are asked to change investment policy guidelines in order to allow for the leverage necessary. This should be a red flag that encourages trustees to research every aspect and possible outcome that can result from this alternative strategy. Loosening rules was the catalyst for the Savings and Loan crisis in the 1980s, as we discussed in "A Status Report on U.S. Pensions: The Saving and Loan Crisis Revisited". Although the intent was to give S&L's leniency in order to help return them to solvency, the eventual outcome was far different.

Portable alpha attempts to reduce (or remove) market risk as measured by beta but pension plan strategies should be focused more on the future obligations. As with standard deviation, reducing beta can lower and even remove market volatility but may not lower the risk of covering liabilities.

## Duration

Duration is a measure of interest rate risk that should be used to match assets with liabilities for pension plans. It measures the time it takes to receive the present value of future payments and is expressed in years. Modified and effective duration (which is referred to simply as "duration" in this paper and is also measured in years) measure the price sensitivity to interest rate movements. Since liabilities are discounted to present value to determine funded status, the movement of interest rates is the most important and relevant type of risk. Characteristically, liabilities can be viewed as the mirror image of zero coupon bonds (assets). Just like bonds, as interest rates change, the present value of the liabilities move in the opposite direction. Higher durations signify greater swings in present value.

The graph below compares the change in the value of bonds versus liabilities with different durations. A group of liabilities (tranche) with a \$6 million present value is matched with a \$6 million bond portfolio. Value for both the bonds and liabilities is calculated using the movement of 5-Year Treasury yields. In this example the liabilities have a duration of 7.89 years suggesting a 7.89% move in present the value with a 1% move in interest rates. The fixed income portfolio has a 4.53 year duration.



The \$400k shortfall three years later is a result of this incorrectly matched duration. Had the asset duration matched the liability duration, the assets would be in line and little to no shortfall would exist. Hence the target for managing the portfolio is not that of a market index or a peer group, but is dictated by the characteristics of the liabilities.

Because of these characteristics, most banks and insurance companies (including the PBGC, the government agency that insures corporate pension plans) match liabilities using predominantly fixed income portfolios with like duration to maintain coverage of expected obligations. These institutions take few risks with equities or alternatives because they are aware that failure means they are out of business. Yet, pension plans do not seem to share the same sense of urgency in regard to risk. The reasons vary. In the case of

government plans, a failed investment strategy can be bailed out by tax payers. Unloading debt to the PBGC seems to be the most popular escape for corporate plans.

The "perfect storm" did great damage because of the temptation for large returns prevalent during the technology revolution. Had interest rate risk been the focus of asset allocation, this storm would have been a spring shower. Future changes to FASB and GASB regulations are expected to tighten pension rules, funneling future strategies towards more secure, liquid asset allocations and toward asset portfolios that more nearly mirror the performance characteristics of plan liabilities.

## Active Immunization

Immunization, the strategy of using duration to match fixed income assets and liabilities, was introduced by F.M. Redington in 1952 to help protect life insurers from changes in interest rates. The investment strategy goal is to bring the difference between the value of an asset minus the value of a liability to as close to zero as possible over time. Also in 1952, Harry Markowitz introduced modern portfolio theory which was expanded upon and popularized by contributions from Merton Miller and William Sharpe during the 1960s.<sup>2</sup>

Over the years, immunization theory has grown and become the accepted actuarial standard for matching bonds with liabilities. But in 1990, Markowitz, Miller and Sharpe received the Nobel Prize<sup>3</sup> for their contributions to the theory of financial economics reviving modern portfolio theory. This coincided perfectly with the introduction of the personal computer giving virtually anyone the ability to easily create efficiency frontiers and optimized portfolios from the comfort of their own homes. Investment

strategies for plans such as endowments and foundations, individuals, and even pensions, transitioned to modern portfolio theory based on higher potential risk adjusted returns. Around this time, reports were published suggesting that immunization was antiquated and no longer applied to the "new economy". One white paper was titled "Immunization is Dead", with the first section labeled "Obituary Notice." As the decade wore on, modern portfolio strategies were viewed as extremely successful because the exploding stock market caused asset returns to consistently outperform liabilities. Suddenly, modern portfolio strategies began to migrate from long-term targets to the intermediate and short term. When the bubble burst and the "perfect storm" hit, many of these pensions plans dropped into underfunded status.

Although a strict immunization strategy may be appropriate when liabilities are fully vested, most

pension plans have volatile non-vested liabilities, even in the short term, which require a more active form of asset management. Matching the cash flow of a bond portfolio with projected liabilities assumes that the liabilities only change with interest rates. In reality, future liabilities are based on fluctuating actuarial assumptions such as inflation, salary increases, hiring projections, benefit increases or decreases, etc. In order to hedge the investment risk while being adaptable to liability changes, an immunization strategy applied through active portfolio management is the most prudent.

There have been many arguments over the years as to whether perfect asset/liability matching is attainable because real world interest rates have different effects on cash inflows than on outflows, creating an inherent mismatch. Reinvestment and credit risk may alter asset valuations causing investments to miss their mark. However, the slight discrepancy with asset/liability mismatch associated with reinvestment risk pales in comparison to the mismatch created for pension funds by traditional asset allocation techniques applied over the past decade.

### **Knowing is Not Understanding**

Without understanding the meaning behind statistical risk calculations, asset/liability strategies may attempt to answer the wrong question. Risk must be defined and understood before it can be reduced. Knowing how to run an application that produces an asset allocation which lands on an efficient frontier, does not necessarily translate into security for payment of pension obligations. Understanding the application of an optimized portfolio is imperative. Recent pension rule changes in Europe and expected changes in the United States are forcing pension plans to move to more secure investment strategies that are based on fundamentals rather than theory. Active immunization strategies used in the short and intermediate term combined with optimized portfolios built using modern portfolio theory in the long term, provide security and consistency to pension investing. Benefits earned by hard working employees should not be left to hoping that the future acts the same as the past. The priority for fiduciaries should be to ensure payment of promised obligations rather than hunting for the cheapest approach to maintain the plan.

### **REFERENCES**

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2 Geoffrey Poitras Frederick R. Macaulay, Frank M. Redington and the Emergence of Modern Fixed Income Analysis

3 <http://nobelprize.org/economics/laureates/1990/press.html>

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## **Using Report Center to Further Automate Your Client Service**

By Wyatt Arthurs, Smith Barney Associate Divisional Technology  
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By now you've probably heard the buzz about Report Center: it's the best new reporting enhancement since Portfolio Minder. It represents the future of Smith Barney Client Reporting. It consolidates many of the reports that were scattered about the systems. Used effectively, it will save you and your team a great deal of time in generating reports for clients.

This article will give you an overview of the system and the background for its creation. It will guide you through the basic navigation of the system, and then share some of the best practices in incorporating Report Center's full functionality into your business.