

The Step-Child of Modern Portfolio Theory: *Uncompensated Risk*

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Through Investment Policy Statements (IPS) and implementation of their resulting asset allocation, a portfolio's compensated (systematic) risk strategies are usually well managed, while the management of uncompensated risk is usually ignored.

Stricter compliance required by a recent U.S. Supreme Court decision, coupled with lower expected returns and fixed liabilities, demands adoption of procedural processes for the assessment and on-going monitoring of uncompensated risk (as required by statute).

It is our conclusion that as many as 90% of fiduciaries have no procedural process in place to monitor and measure Uncompensated Risk (UCR) to determine if it has been reduced to a Reasonable Level and therefore may be in breach forever until cured.

INTRODUCTION

The history of FIDUCIARY Law shows constant evolution in defining the diversification requirements of a prudent portfolio. Currently, they are grounded in Commentary to Section 3, of the Uniform Prudent Investor Act (UPIA):

"Modern portfolio theory divides risk into the categories of "compensated" and "uncompensated" risk. The risk of owning shares in a mature and well-managed company in a settled industry is less than the risk of owning shares in a start-up high technology venture. The investor requires a higher expected return to induce the investor to bear the greater risk of disappointment associated with the start-up firm. This is compensated risk -- the firm pays the investor for bearing the risk. By contrast, nobody pays the investor for owning too few stocks. Risk that can be eliminated by adding different stocks (or bonds) is uncompensated risk. The object of diversification is to minimize this uncompensated risk."

In turn, UPIA is grounded in the Restatement of Trusts 3rd. There have been three Restatements of Trust Law during the last 85 years:

- 1) The (1st) Restatement of the Law of Trusts by Thurman W. Arnold, Yale Law School, **1931**. This consisted of 23 pages in total and did not include any reference to investment diversification.
- 2) Restatement of Trust Law 2nd, American Law Institute, **1957**. This consisted of 3 volumes, 12 pages on Investment of Trust Funds, and a 2-page section on The Duty to Diversify.
- 3) Restatement of Trust Law 3rd, American Law Institute, **1992**. This was Volume 8 Section 227, specifically addressing the General Standard of Prudent Investment and consisting of 100 pages. Ten pages were specifically on "Risk and the Requirement of Diversification."
 - a) Modern portfolio theory is discussed **10** times.
 - b) Systematic, compensated and non-diversifiable risk are used interchangeably and are discussed **19** times.
 - c) The terms uncompensated, unique, specific and diversifiable risk are used interchangeably and are discussed **24** times.

In reference to the 3rd Restatement the following quotes stand out:

“The duty of caution does not call for avoidance of risk by trustees but for their prudent management of risk.” (pg. 18)

“In understanding a trustee's duties with respect to the management of risk, it is useful to distinguish between diversifiable (or "uncompensated") risk and market (or non-diversifiable) risk that is, in effect, compensated through pricing in the marketplace.” (pg. 19)

“The trustee's duties and objectives with respect to non-diversifiable (compensated) risk are not as distinct as those with respect to diversifiable (uncompensated) risk.” (pg.19)

“Failure to diversify on a reasonable basis in order to reduce uncompensated risk is ordinarily a violation of both the duty of caution and the duties of care and skill.” (pg. 23)

Uncompensated Risk Defined

Investment Risk is risk that can be eliminated with diversification and unlike systematic or compensated risk, investors cannot expect added return for assuming more uncompensated risk. Uncompensated risk comes from the inherent risk of investments in industry and sectors, individual firms and, in addition, having too many of industries/sectors/firms that are closely correlated or uncorrelated. Uncompensated risk represents approximately 2/3 of total risk.

From the inception of Modern Portfolio Theory, only academics have taken the time and effort to measure how much uncompensated risk (UCR) can be eliminated when constructing a portfolio. However, the academic standard for UCR measurement requires the portfolio be built entirely of equally weighted (to overcome weighting bias), and randomly selected (to overcome selection bias) constituents.

As a result, real world portfolios built for maximized risk-adjusted returns (compensated risk), cannot accommodate those rigid constraints, so industry practice *focused on managing compensated risk* through asset allocation while ignoring management of UCR, even though it has been part of fiduciary law for more than 20 years.

Instead, industry practice defaulted to adding a sufficient number of somewhat un-correlated “investments” to a portfolio. That practice was based on the assumption inherent in Commentary to Section 3 of the UPIA that adding investments would remove the concern of having “too few investments” and UCR would be reduced to prudent levels.

While causing some portfolio UCR to be reduced, that practice creates other new UCR. The reasons for this apparent anomaly are that academics investigated UCR in the context of constructing an entire portfolio, whereas practitioners must diversify to eliminate UCR from a pre-existing asset allocated portfolio. Furthermore, the old academic approach to UCR assessment could not be asymmetrical until the arrival of **BIG MATH**.

*THE ARRIVAL OF **BIG MATH** IS CHANGING EVERYTHING*

We have developed, along with a few other seasoned fiduciary consultants, a proprietary testing protocol that calculates and measures the absolute equivalent number of equally weighted diversification resources, also known as diversification dimensions (DDs) present in a portfolio. Each DD has the ability to move independently within a portfolio's structure. More DDs equal more diversification and the presence of less Uncompensated Risk. We use the following known methods to determine a portfolio's DDs:

[Weighted Average] Intra-Portfolio Correlation (IPC): IPC is a stand-alone holistic measure that identifies the degree to which all of the assets in a portfolio move together. Relative portfolio metrics such as alpha, beta and r-squared measure an asset's movement against that of the market or an index. IPC measures a portfolio's overall diversity, and identifies how well or poorly the portfolio will react to systematic or market risk.

Concentration Coefficient (CC): CC is a metric that measures the level of a portfolio's concentration as the number of investments held, if they were all equally weighted. CC is an important non-systematic diversification metric because of the significant role constituent weightings play in a portfolio's overall diversification. The higher the CC number, the better the portfolio is protected against company or strategy specific risks.

Eigenfactor Dimensionality (KLD): KLD is a metric that quantifies the number of diversification elements that have the ability to move independently within a portfolio's structure. The larger the number of independently moving elements in a portfolio, the broader the portfolio's diversification.

Diversification measurement has two basic inputs: the relationship of each asset to every other asset in the portfolio, as measured by their cross correlations, and the utility function for every asset, as measured by the relative attractiveness of each asset. These asset variables are used to quantify the diversification Alpha at both the security and asset class level and form the basis for UCR elimination.

DUTY TO INVESTIGATE AND MONITOR

Additionally, this methodology can be utilized to determine how much UCR is present in an existing portfolio and becomes an important tool for complying with a fiduciary's DUTY TO INVESTIGATE and MONITOR, defined in Comments to UPIA Section 2 as follows:

"[The UPIA] carries forward the traditional responsibility of the fiduciary investor to examine information likely to bear importantly on the value or the security of an investment."

"*Managing* embraces monitoring, that is, the trustee's continuing responsibility for oversight of the suitability of investments already made as well as the trustee's decisions respecting new investments."

YOU MAY BE IN BREACH FOREVER

Fiduciaries must realize that since there is an acceptable methodology for measuring UCR, then they have the DUTY TO INVESTIGATE, and as a part of that DUTY they must follow procedural prudence. Two recent court decisions emphasize the importance of diversification for fiduciaries:

- 1) In a U.S. Circuit Court ruling in *Tatum vs. RJ Reynolds Pension Investment Committee et al*, (a/k/a the "good luck case") the panel found the defendant breached its fiduciary duty when it made the right decision for the wrong reason (by failing to follow *procedural prudence*). The dissenting judge on a three judge panel was so exercised by the majority, he wrote, "Good luck to anyone who wants to be a retirement plan trustee" in his dissenting opinion.

According to RJR's attorney, the takeaway from this case is: "Fiduciaries must maintain a documented record of a procedurally prudent process."

<http://www.ERISAPRACTICECENTER.COM/2014/08/19/divided-fourth-circuit-panel-rules-on-burden-of-proving-loss-causation-in-ERISA-fiduciary-breach-case/>

- 2) In a major ERISA fiduciary duty case, The Supreme Court ruled 9-0 (Yes, an unusual unanimous decision—no doubts here) in favor of 401K participants versus Edison International overturning the 9th Circuit Court of Appeals. Supreme Court Justice Breyer in *Tibble v. Edison International* wrote:

"ERISA's fiduciary duty is derived from the common law of trusts, which provides that a trustee has a continuing duty ... to monitor, and remove imprudent investments."

"So long as a plaintiff's claim alleging breach of the continuing duty of prudence occurred within six years of the suit, the claim is timely" (i.e. the statute of limitations doesn't start to run until the imprudent actions stop and where imprudence continues the breach goes back to when it started, potentially to the inception of the fiduciary's stewardship).

The takeaway from this case regarding UCR is the necessity for the fiduciary to have a prudent UCR strategy—one that must be prudently established and prudently monitored, otherwise the statute of limitations will never start to run.

<http://www.scotusblog.com/case-files/cases/tibble-v-edison-international/>

The combined takeaway regarding UCR from the two cases is that all fiduciaries should focus on complying with UCR standards and document their *procedural prudence* by:

1. Developing a prudent diversification strategy for managing UCR.
2. Incorporating the strategy in the Investment Policy Statement (IPS).
3. Implementing the strategy in managing the portfolio.
4. Performing periodic monitoring for UCR and its IPS compliance; it's their DUTY.

CASE STUDY - THE CALIFORNIA STATE EMPLOYEES PENSION PLANS

We have reviewed 37 Investment Policy Statements of California Public Retirement defined benefit plans: CALPERS, CALSTRS, the twenty (20) member counties of SACRS (State Association of County Retirement Systems), the seven California cities with separate plans, the

six district and regional plans, the U.C. Retirement System Plan, and the BART Investment Plan. These 37 entities have approximately $\frac{3}{4}$ Trillion Dollars in market value invested assets. There are an additional 49 defined benefit entities in California with very small comparative invested assets or that are closed to new members, and their IPSs were not reviewed.

Only four (4) plans mentioned UCR, nonsystematic, or diversifiable risk! The way the four plans discussed UCR in their IPS is shown below.

SONOMA COUNTY: “The Investment Committee believes in a broadly diversified portfolio with a combination of asset classes in proportions designed to provide a desired risk-return profile. While there are many types of investment risks and various methods for estimating them, one construct is to think in terms of systematic or market risk and non-systematic risk. The broadly diversified portfolio limits non-systematic risk and leaves principally the systematic risk associated with the asset classes included in the asset allocation mix. Modest levels of non-systematic risk are inherent when the Plan employs active investment managers but in these cases risks are mitigated and constrained by imposing limits on the investment manager’s freedom to deviate from the benchmark and by employing investment managers with complementary approaches to investing. (See the Investment Guidelines section below for details.)”

SANTA BARBARA COUNTY: “Risk and Return Considerations: The Board accepts the risks associated with investing in the capital markets (market risks), but will seek to minimize wherever possible those risks for which the Retirement System is unlikely to be compensated (non-market or diversifiable risks).”

SAN MATEO COUNTY: “SamCERA should not pursue investments that will not adequately compensate it for the risks that those investments bring.”

SAN JOSE CITY FEDERATED PLAN: “No single fund should contribute more than 20% to the expected risk of the absolute return portfolio, as measured by the fund’s contribution to the 3 year standard deviation of the Current Systematic series as generated by Albourne, and illustrated in their monthly risk reports. The Current Systematic Series represents “forecast risk” and is a return series constructed from the portfolio’s aggregate systematic exposures at the end of the month held static while the factor performance is varied going back in time.”

Only Sonoma County discusses reduction of uncompensated or not-systematic risk in any depth. However, they relied on an assumption that the more investments they have the less uncompensated risk in the portfolio. They also discussed that the managers not travel far from their benchmark in order to reduce UCR but they failed to follow the 3rd Restatement by having a procedural process to determine if UCR has been eliminated to a reasonable level. Since they do mention UCR as important, it is problematic whether or not they are “in violation of both duty of caution and the duties of skill (pg. 23 Section 227 Volume 8)” and therefore in breach.

Two other counties, San Mateo and Santa Barbara, make mention of uncompensated or non-systematic or non-market risk. The San Jose City Federated Plan mentions systematic risk in regards to Hedge Funds, but their Fire and Police Plan does not. They have no procedural process in place. In breach? San Jose relies on the investment consultant. Are they in breach?

However, there is no doubt concerning the remaining 34 pension plans that account for 99% of the money in the 37 plans. It is possible that they are not only in breach but the statute of limitations regarding this issue has not started to run, and until an acceptable procedural process is included in their IPS and implemented, it will never start to run.

CASE STUDY OF WIDE SPECTRUM OF PORTFOLIO SIZES

Since early 2015 we have, as examples, measured and assessed removal of UCR of portfolios from a \$10,000 Schwab ROBO, a \$1 million 'boomer' retirement portfolio, a \$5 million not-for-profit endowment, a \$130 million family office, a \$330 million hospital endowment, and a preliminary UCR assessment of a \$10.5 billion public employee association. -Of these portfolios only one had reduced UCR to a degree that, in our opinion, met the "reasonable diversification" fiduciary standard, the \$5 million not-for-profit portfolio.

Our overall experience tells us that:

- 1) Smaller, retail portfolios, cannot easily and economically reduce UCR because the costs of adding more assets is greater than the savings reduced UCR can provide, and
- 2) the larger the portfolio size the easier is to eliminate as much as 70-90% of UCR.
- 3) and therefore, smaller portfolios, and their trustees, may have a lower standard of UCR removal, whereas large portfolios, and their trustees, must eliminate a much higher percent of UCR to meet the fiduciary standards for UCR reduction – 75-90% is reasonable.

CONCLUSION

Since 1992 the Fama/Booth formula has been used as a generally accepted method for measuring added returns resulting from diversification. Although published in 1992 that formula is still valued for measuring how much UCR was eliminated from a portfolio by diversification.

Once UCR was identified, its management required judgment calls on which assets to include on a one-at-a-time, trial and error basis and which assets to exclude and which ones to add. After each change, the revised portfolio had to be retested using the Fama/Booth formula to see if the changes favorably impacted the overall diversification return.

Until recently there was no acceptable method to both quantify UCR and then identify which assets to remove and which assets to use as their replacements to minimize UCR. With the advent of BIG MATH the quantification of UCR and finding the right combination of non-correlated assets can be determined with a single algorithm. This methodology quantifies UCR then identifies which assets need to be replaced and which need to be added in order to achieve maximum UCR reduction.

It is our conclusion that as many as 90% of fiduciaries have no procedural process to monitor and measure Uncompensated Risk (UCR) to determine if it has been reduced to a Reasonable Level and therefore the responsible fiduciary may be *in breach forever until cured!*

This conclusion should provoke a compelling question of all fiduciaries: upon investigation and monitoring, and then finding a procedural process area of concern that needs to be changed or revised, how soon after this discovery should the fiduciary take action? And, if it was discovered in the past but not considered a problem, does that become a breach in the future if not *presently* addressed in a timely manner?

Consider the amount of risk associated with a “wait and see” approach, compared to having a preliminary 3rd party evaluation of UCR prepared by seasoned fiduciary consultants at a reasonable cost. For larger organizations, in-house ability can be added with time and the experience of working with a qualified and seasoned consultant.

Finally, if a UCR portfolio assessment were to show a shortfall in reduction of UCR, one must ponder the potential of obtaining additional DIVERSIFICATION ALPHA at both the security and asset class level during this difficult and trying period for retired individuals and public and private pension plans many employees depend on.

REMEMBER THE *BAD APPLE* ANALOGY



The asymmetrical nature of the problem is best illustrated by the proverb: “**one bad apple spoils the barrel!**” It applies to prudent diversification of a portfolio because allowing a “bad apple” security (one that increases a portfolio’s UCR) to remain in the “barrel” (portfolio) compromises the entire portfolio because it contaminates the other securities by making them less of a diversification factor.



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