Peterson Research Institute

Global Investment Analysis (GIA)

GLOBAL INVESTMENT ANALYSIS

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Investment Risk and Portfolio Risk

for Superannuation Directors and Trustees

This note follows on from my earlier "Portfolio Theory in the Real World" paper for the Directors and Trustees of superannuation and other investment funds. The purpose of this note is to provide an understandable outline of issues around risk in investing.

Principle

The basic principle that is almost **universally not understood** when speaking about risk and investments is that **Investment Risk and Portfolio Risk are very different things**. To demonstrate, consider the idea of the "Risk / Return Trade-off", which we have all heard of, and generally think that we understand.

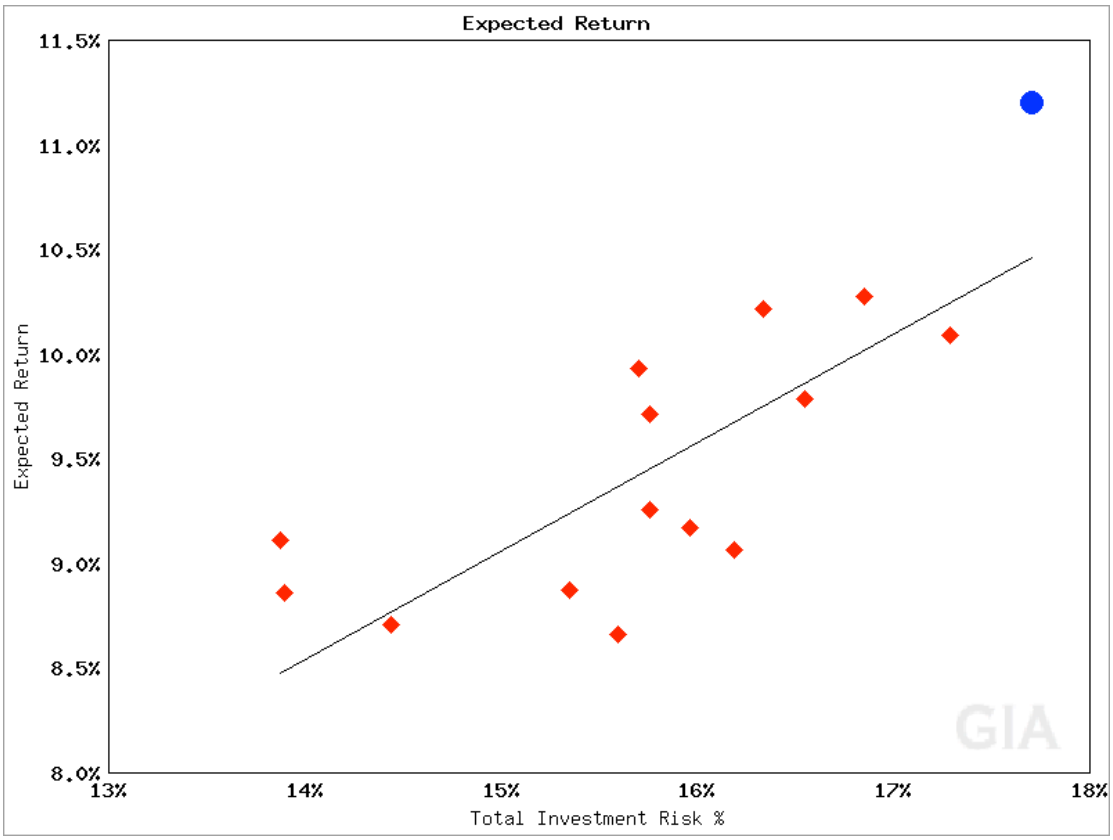
The essence of the Risk / Return Trade-off is the idea that in order to earn higher rates of return it is necessary to take higher levels of "risk". We typically associate this higher "risk" with an increased likelihood (i.e. probability or frequency) of "loss" on an investment portfolio (increased Portfolio Risk). Hence we create portfolios of increasing "risk", that we describe with terms such as 'conservative', 'balanced', 'growth', 'high growth', etc., that we expect will have higher levels of return over time.

This, quite standard, description **is incorrect**. It is generally correct that **higher levels of Investment Risk are associated with higher Expected Returns**. However **Investment Risk has little relationship to the level of Portfolio Risk.**

To understand this difference, consider the GIA analysis of the Future Fund's investment portfolio as at June 2013. First, recall that the two sources of Investment Risk that a portfolio may earn returns from are Market Risk and Manager Risk (or Manager Skill). As returns earned from taking investment risk are additive, then the sum of these two risks is Total Investment Risk.

The Expected Return of the Future Fund versus Total Investment Risk is plotted as the blue circle in Chart 1. The Expected Returns versus Total Investment Risk of 14 of Australia's major balanced / growth style super funds are also plotted in red.

Chart 1



The total of the Investment Risks (market + manager), expressed as volatility (% p.a.), being taken by the Future Fund is ~17.5%, (this is 2% higher than the average super fund), with an Expected Return approximately 1.5% p.a. greater over time. This relationship is in line with the Risk / Return Trade-off.

The Future Fund's Total Investment Risk (17.5%) is roughly in line with investing 100% of its assets in Australian Equities. Based on the Fund's Investment Risk **it may therefore be tempting to classify the Future Fund as a "High Growth" style portfolio** with a high risk of negative returns in the short term. **In reality, nothing could be further from the truth.**

Now consider Chart 2, which plots the Future Fund's **Expected Return against a measure of Portfolio Risk** - the Probability of a Negative 1 Year Return. (Using any other measure of Portfolio Risk, such as volatility or expected number of negative 1 year returns over a 20 year period, would give exactly the same result.)

Chart 2

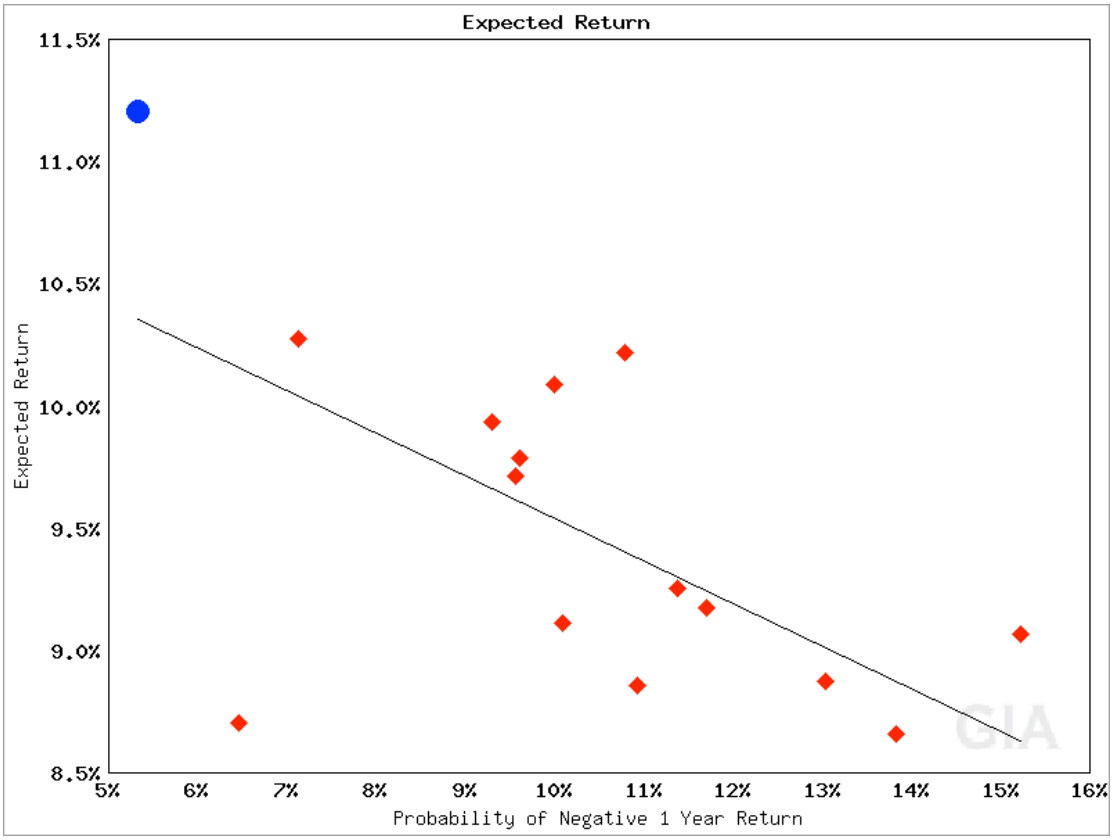


Chart 2 represents the more commonly presented return versus risk diagram in the investment industry, with Portfolio Risk on the horizontal axis, and Expected Return on the vertical axis. We would **typically expect to see the "Risk / Return Trade-off" sloping upwards to the right, as in Chart 1, but this is not the case!!! This is because Portfolio Risk is not the same as Investment Risk.**

What the GIA analysis in Chart 2 shows is that the Future Fund's investment portfolio actually has a **much lower level of Portfolio Risk** than Australian superannuation funds' growth investment portfolios, with approximately ½ the likelihood of loss than the average superannuation fund, even though the Expected Return (which is based on Investment Risk) **is higher**.

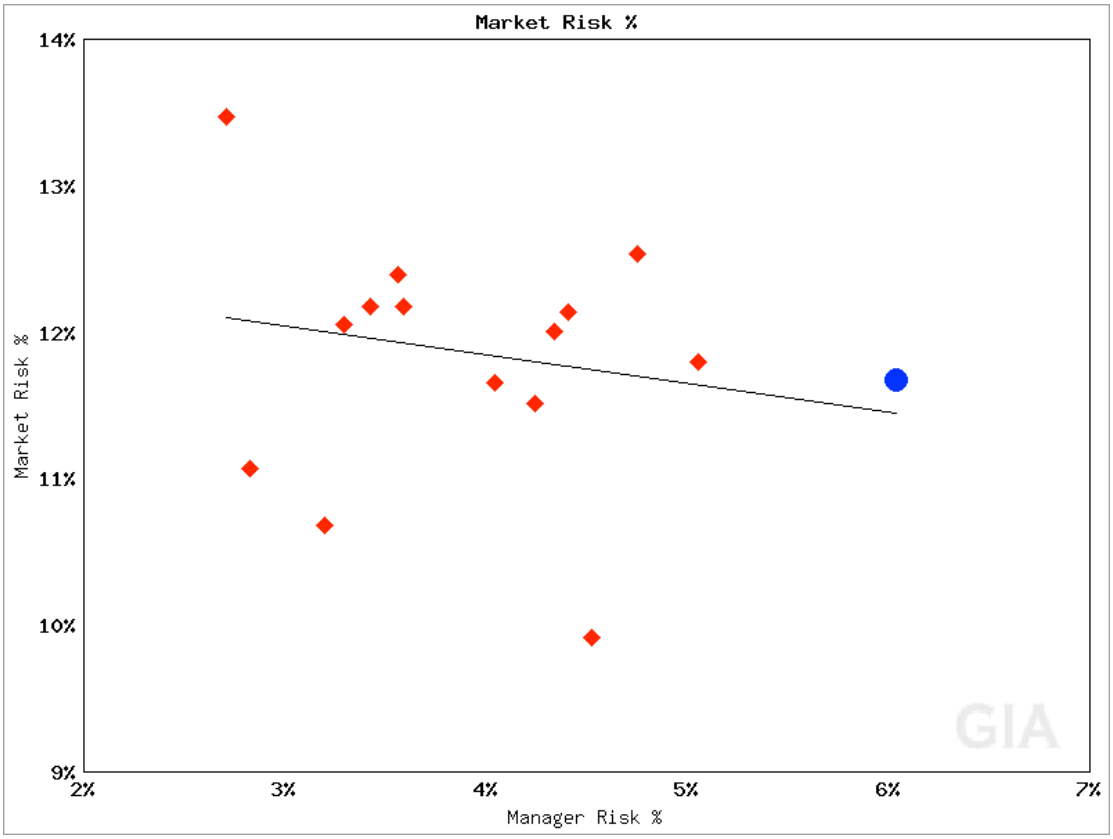
The Apparent Inconsistency

For virtually everyone with even a passing exposure to the current investment orthodoxy (Modern Portfolio Theory and its associated ideas) the outcome for the Future Fund's portfolio presented above will appear counter intuitive, and inconsistent with 'reality'.

In fact, both the Future Fund's outcome, and investment theory, are correct. The apparent inconsistency arises from the widespread **incorrect implementation of Portfolio Theory**. The universal mistake that is made is **to ignore the existence of manager skill**.

Consider Chart 3, which plots the levels of Market Risk (vertical axis) and Manager Risk (horizontal axis) in funds' portfolios.

Chart 3



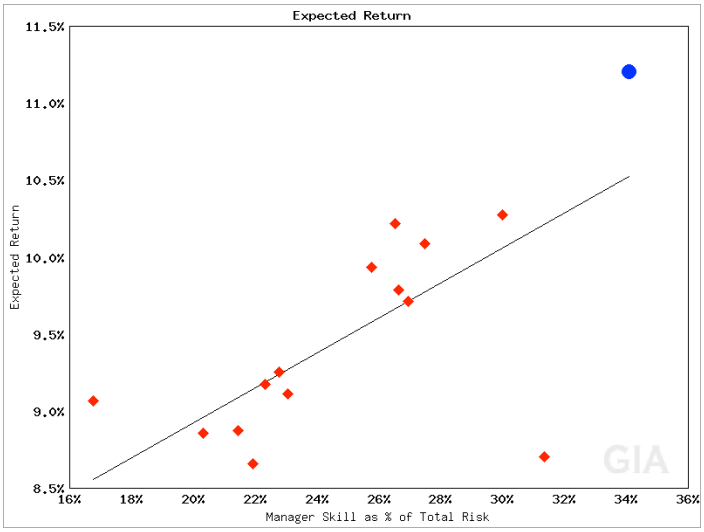
What is apparent is that while the Future Fund has largely the same level of Market Risk as Australian Superannuation Funds, it has made a higher allocation to Manager Skill than those funds. Thus the Future Fund has a higher overall level of Total Investment Risk, with corresponding higher Expected Return.

While the level of return is directly related to the level of Total Investment Risk (as returns are additive), because of the diversification effects of the higher proportion of Manager Skill the Future Fund's portfolio it actually has a relatively low level of Portfolio Risk. Correspondingly it has a lower likelihood of loss.

This linkage can be seen in Charts 4 and 5, which plot Expected Return and Probability of Negative 1 Year Return respectively,

against the proportion of Manager Skill in fund's Total Investment Risk.

Chart 4

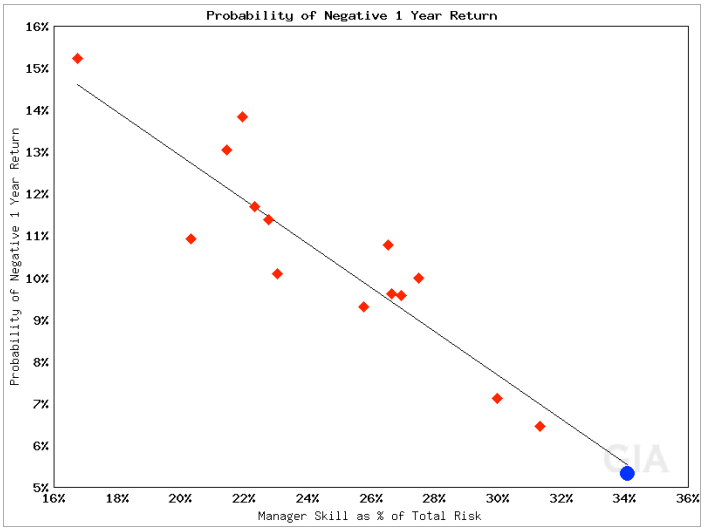


In the case of the Future Fund, Manager Skill represents ~1/3rd of Total Investment Risk. This is higher than for Australian superannuation funds.

Thus, while expected returns are higher, the greater level of Manager Risk, that is less correlated to Market Risks, leads to the Future Fund having a lower level of Portfolio Risk.

Thus, we have the relationship that higher levels of Investment Return are associated with lower levels of Portfolio Risk.

Chart 5



It should be noted that this relationship follows directly from the inclusion of Manager Skill in Portfolio Theory.

John Peterson
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Investment Returns are earned by taking Investment Risk

Investment Risk and Portfolio Risk are very different things

GIA is provided free to Institutional Investors at www.**prigia.com**