



“HOW WE INVEST” WHITE PAPER
DIVERSIFICATION

By **Joe Cheung**,
Guardians of New Zealand Superannuation

SEPTEMBER 2014

www.nzsuperfund.co.nz
email:enquiries@nzsuperfund.co.nz

PREFACE

This paper is a summary of one of a series of internal Guardians discussion workshops. We'd found ourselves having discussions about a specific investment where what we were really debating was a much more fundamental investment issue. The workshops were designed to explore team members' views, and understand the basis of internal agreement and disagreement, on a range of these fundamental issues. We knew that we were not necessarily going to resolve all of these issues, but we would come away with a better understanding of the key differences in opinion. Most importantly, we also considered the implications of each issue for how we construct our investment portfolio.

Holding the workshops, and developing these papers, has helped us provide a consistent vision to staff, to focus our time and resources appropriately and to avoid re-litigating some of the fundamental investment questions that investors deal with on an ongoing basis. I hope they also enhance your understanding of how we go about investing the NZ Super Fund.



Matt Whineray
Chief Investment Officer



FIND MORE PAPERS AT:
www.nzsuperfund.co.nz/publications/papers-reports-reviews

Diversification is an age-old concept¹ and has been at the core of portfolio management since Markowitz's pioneering work in Portfolio Theory (1952).² Although diversification is an intuitive concept, which we summarise briefly below, it often means different things to different people. There are also diverse views on what is relevant in determining the diversification benefits of assets or investment strategies.

This article outlines some views and considerations on diversification. We also discuss why these considerations are relevant in terms of how we invest.

WHAT DO WE MEAN BY DIVERSIFICATION?

A key insight from Markowitz's work is that we can lower the risk of any portfolio, without having a negative impact on the portfolio's expected return³, by spreading an investment sum across many assets. This comes about because a large part of the risk of many investment assets is 'idiosyncratic' or particular to those assets. When a number of such assets are held in a portfolio, their idiosyncratic (or uncorrelated) price changes tend to offset each other. Under this rudimentary view, diversification simply refers to the approach of spreading an investment sum across many assets in order to minimise the exposure to idiosyncratic risks of individual assets.

While simple, and useful, this conceptualisation does not lead to any important investment implications other than "we should hold more assets in a portfolio". In practice, diversification is more often used in the broader context of portfolio efficiency: an investment strategy or asset class is said to provide diversification benefits if it is expected to improve a portfolio's risk-adjusted return (or Sharpe ratio).⁴ This broader concept of diversification is what most institutional investors have in mind when designing their strategic asset allocation. The key rationale for including alternative asset classes such as timber and hedge funds in their asset allocation is to improve the risk-adjusted return or efficiency of their portfolios. This broader interpretation of what diversification is meant to achieve is also more relevant to the Fund, given our Reference Portfolio construct and the way we organise our value-add activities.

1. An early diversification strategy can be found in the Talmud, which contains a record of the teachings and debates among rabbis dating as early as 1200 B.C.: "Let every man divide his money into three parts, and invest a third in land, a third in business and a third let him keep by him in reserve."

2. Markowitz, H.M., "Portfolio Selection" The Journal of Finance 7 (1) March 1952: 77-91

3. This assumes that the broader group of assets are chosen to achieve the same expected return target for any given portfolio. The more general statement is that, with diversification, we can earn the average expected return of the assets while bearing significantly less than the average of the individual asset's risk.

4. The Sharpe ratio is defined as the ratio of the portfolio's expected return above the risk-free rate and the portfolio's volatility. Alternatively, using jargon from Modern Portfolio Theory, an asset or strategy is said to provide diversification benefits if it can move the portfolio closer to the 'efficient frontier'.

KEY CONSIDERATIONS

In principle, if risk-adjusted return is the only consideration, it should be a relatively straightforward matter to decide whether an investment is expected to bring diversification benefits to an existing portfolio. In practice, however, the decision is often not as clear-cut. There is typically some degree of uncertainty around the risk and return characteristics of diversifying assets, such that some qualitative assessments are necessary. There could also be considerations which the standard risk-adjusted return measure cannot encapsulate. We discuss some of these considerations below.

EXPECTED RETURNS

There are portfolio diversification strategies that disregard expected returns. For instance, expected returns are not considered in the risk-parity approach which advocates a portfolio structure in which each asset class has an equal risk contribution. The maximum diversification approach provides another example of such strategies.⁵ Proponents of both of these approaches claim that the resulting portfolio is more diversified than a typical strategic asset allocation. We disagree. A diversification strategy ought to improve a portfolio's risk-adjusted return and therefore we favour approaches that explicitly take both risk and return into account over those that ignore expected returns altogether.

TIME HORIZON

Suppose that the risk-adjusted return for a new asset class is deemed to be very attractive over the short term. Also, suppose that the long-term or equilibrium-risk-return characteristics of the asset class will be equity-like and therefore the asset class is not expected to provide any diversification benefits over the long-term horizon. Is an investment in this asset class today a diversification strategy? More generally, is diversification a time-horizon-specific strategy?

At the Guardians, we find it useful to view diversification as a long-run equilibrium concept rather than a time-horizon-specific concept. If we believe that the risk-and-return characteristics of an asset are appealing over a shorter time horizon, we would invest in the opportunity just the same but identify market pricing rather than diversification as the key rationale. Under our Reference Portfolio construct, we add value to the Reference Portfolio by: (i) varying the allocation to assets over time based on market pricing; (ii) maintaining a meaningful allocation to diversifying assets on average across time to improve the actual portfolio's risk-adjusted return at the Fund. Market pricing and diversification opportunities are deliberately governed by different risk budgets and therefore it is important for us to be very clear about the key investment rationale supporting any investment strategy.

SKILLS

Do skill-based strategies such as those pursued by market-neutral hedge funds provide diversification benefits to a portfolio? Firstly, strategies based on asset selection skills aim to earn a positive return relative to a benchmark (known as 'alpha') from taking on idiosyncratic risk, which is the type of risk that diversification is intended to eliminate. Labelling skill-based strategies as diversification strategies will be problematic at this very basic level. Secondly, alpha is zero in equilibrium and therefore not a diversification strategy under the view that diversification is an equilibrium concept. Of course, if we believe that alpha is positive, skill-based strategies will likely improve the risk-adjusted returns of an existing portfolio given that the idiosyncratic risk that comes with them is, by definition, uncorrelated with the risk of other assets in the portfolio. However, a positive alpha is conditional on the ability to identify skill and capture the excess return (after fees) despite alpha being a 'zero-sum game' (i.e. alpha should be zero in aggregate). We do not think that diversification is a key rationale for skill-based strategies.⁶

⁵ See Choueifat, Y. "Towards Maximum Diversification", *Journal of Portfolio Management*, Fall 2008, v.35 no.1 pp.40-51.

⁶ At the Guardians, we have an investment belief that the skill for alpha is difficult to identify and capture. Therefore, we have a smaller risk budget allocation to asset selection opportunities, and the hurdle for appointing a skill-based manager is relatively high.

SCENARIO ANALYSIS

As mentioned earlier, there is typically some degree of uncertainty around the risk-and-return characteristics of diversifying assets. Therefore, before deciding on the diversification benefits an asset or a strategy can bring to the portfolio, it may be useful to conduct some analysis to gauge how the portfolio would perform under a set of scenarios. Of course, coming up with scenarios is different from knowing the likelihood of those scenarios. If the 'good' scenarios are as likely to happen as the 'bad' scenarios, then the scenario analysis may not have any impact on our assessments that are based on some central estimates. Nevertheless, a scenario analysis can provide us with a richer context in making any diversification assessments.

There is another benefit that comes with a scenario analysis. A scenario analysis will invariably include scenarios of stressed market conditions, when returns on different assets are more correlated than what we normally assume. This will force us to assess whether diversifying assets are still likely to provide the benefits we expect of them in a crisis situation. Even though such an analysis may not change our initial diversification assessments, it does help test our downside risk tolerance and our awareness of potential liquidity requirements.

UNLISTED ASSETS

The true global market portfolio is made up of assets in both listed and unlisted markets, and the markets for investible unlisted assets are sizeable. Therefore, the inclusion of unlisted assets in a portfolio of only listed assets is likely to result in a more diversified portfolio. The key issue here is less about whether we can expect some diversification benefits from unlisted assets; it is more about how much diversification benefit we can expect from including these assets in the portfolio.

When it comes to unlisted assets, liquidity is an important part of the risk and return considerations. It is our view that illiquidity comes with its own risks and reward, but that the illiquidity risk premium we expect to earn from holding illiquid assets generally provides an adequate compensation for bearing illiquidity risks. Also, we are of the view that unlisted assets can provide diversification benefits (after costs) to the Fund. The size of such benefits is meaningful enough for us to pursue but we also recognise that it diminishes in relative terms as more diversifying assets are added to the portfolio.

SUMMING UP

Diversification is an important concept in portfolio construction. It is the key reason why many institutional investors include alternative asset classes in their portfolio. In this article, we clarified what we mean by diversification and outlined some important considerations when deciding the diversification benefits an asset or strategy can bring to a portfolio. The key points include:

- We hold a broad view of diversification: an investment is said to provide diversification benefits if it is expected to improve a portfolio's risk-adjusted return or Sharpe ratio.
- There is some degree of uncertainty around the risk-and-return characteristics of diversifying assets.
- A diversification strategy ought to improve a portfolio's risk-adjusted return. We favour approaches that explicitly take both risk and return into account over those that ignore expected returns altogether.
- Diversification is a long-run equilibrium concept rather than a time-horizon-specific concept.
- Diversification is not a key rationale for skill-based strategies.
- Scenario analysis can provide some context to help assess diversification benefits. It can also help test our downside risk tolerance and make us become more aware of potential liquidity requirements.
- Unlisted assets can provide diversification benefits (after costs) to the Fund. The size of such benefits is meaningful enough for us to pursue but we also recognise that it is diminishing in nature as more diversifying assets are added to the portfolio.

At the Guardians, our goal is to add value to the Reference Portfolio. We have an overall risk budget to achieve that goal and we need to be judicious in how we use it to maximise the value we add. To do so, we allocate the total risk budget to broad categories of investment opportunities in accordance with our endowments and beliefs, our confidence in the sources of returns, and our preferred implementation style. These broad categories include diversification, market pricing and asset selection, all of which represent the key rationales behind our various investment opportunities. It is in the context of such an investment framework that we need to think hard and be clear about the rationales for our investment strategies. A clear articulation of the investment rationale for each and every opportunity is a necessary discipline in how we invest.